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Fiscal Deficit-Economic Growth Nexus in Zimbabwe: A Vector Auto Regression Analysis

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Abstract:

The main objective of the study is to investigate the relationship between fiscal deficit and economic growth in Zimbabwe for the period 1980-2015. The study employs Vector Auto Regression (VAR) model coupled with variance decomposition and impulse response functions to analyze the relationship. Before estimation is done the variables are tested for unit root using the Augmented Dickey-Fuller (ADF) test. The ADF tests results reveal that both budget deficit and economic growth are integrated of order one. However the test of Johansen co-integration test shows that there is no co-integration between the variables implying the use of Unrestricted VAR. The regression results reveal that there is a negative relationship between budget deficit and economic growth. This supports the Neoclassical hypothesis. In line with this, the study recommends the fiscal authorities to strengthen fiscal framework, display a high sense of transparency in the fiscal operations and enhance strategies for better government expenditure

Keywords: Fiscal Deficit Vector Auto Regression, Augmented Dickey-Fuller Test, Co-integration

1. Introduction

The fiscal deficit and economic growth nexus has highly received debatable views as economies the world over seeks to maintain macroeconomic stability and sustaining growth. Developing countries particularly in Africa face high fiscal deficits due to increases in recurrent expenditures, unbudgeted spending and reliance on the budget to finance election activities. The discussion on fiscal management is essential to economies because fiscal policy affects, aggregate demand, the distribution of wealth, and the economy's capacity to produce goods and services thus in the short run, changes in spending or taxation can alter the volumes of demand for goods and services in an economy. Aggregate demand will in turn affect the allocation of resources and the productive capacity of an economy through its impact on the returns to factors of production and the allocation of capital spending.

The purpose of this paper is to infer from literature the possible impact of fiscal deficit on economic growth between the periods 1980-2015 with a view of establishing the possibility of a relationship between the two indicators in the economy. The study claims that fiscal deficit negatively affect economic growth. This is a response to the persistent and consistent budget deficit that the government of Zimbabwe has been incurring from as late as 1980 till today and the surge of the current account deficit in recent years. This study will econometrically estimate the relationship between fiscal deficit and economic growth by using Granger Causality test and Vector Auto Regression (VAR).

1.1. Trends in Fiscal Deficit and Economic Growth in Zimbabwe

Since independence Zimbabwe has run its economy with a fiscal deficit. The post-independence economic growth records presented an economy that was progressing well. Given the achievement of peace, economic growth was recorded at 12% in 1980 and slowed down to 7.5% in 1981. Since this period however the country's economy has continued on a downward trend though some notable growth occurred in the years when agricultural production was boosted by a favourable rainy season. The rest of the 1980s displayed a growth that averaged 4%.

In 1991 the Economic Structural Adjustment Program (ESAP) did not however yield the expected growth rates in the economy as growth rate remained at an average of 2%. Under ESAP, state enterprises were privatised and trade was liberalised it was an objective of the policy to reduce fiscal deficit and inflation to single digit. The programme faced the challenges of drought and the fiscal deficit increased due to increased imports to supplement supply for the nation that was hit by a natural disaster. A second phase of the structural program was implemented in 1996 but did little to revive the economy. In 1999/2000 the implementation of the Land reform Programme adversely affected the supply side of the economy as it resulted in output declining from the commercial sector which resulted in a decline of about 30% in the value of exports. Further deterioration of the economy was reflected in the government's fiscal deficit which continued to expand reaching 23% of GDP in 2000. The economy faced hyperinflation resulting in a cumulative

decline of 44.4% in economic activities during the period 1999 to 2006 (Chakanya, 2008). Also other important factors that contributed to the continued decline in the economy were the continuation by government to run fiscal deficits, largely financed by domestic borrowing and the monetisation of deficits which lead to hyperinflation.

Fiscal expenditure continued to rise after 2003 as interventions put in place by the Central Bank actually raised 'quasi-fiscal' expenditures to levels exceeding the budget. This situation continued until 2009 when the Government of National Unity was formed. Zimbabwe's economy began to recover after the formation of the Unity Government which brought with it a favourable external environment, the end of hyperinflation, the adoption of a multicurrency system, cash budgeting and the discontinuation of quasi-fiscal activities by the Reserve Bank of Zimbabwe. Between 2010 and 2011 the country experienced growth averaging 9.5% sustained by strong external demand for key mineral exports and continued recovery in domestic demand. However despite higher exports, the current account deficit widened to 36% of GDP in 2011 from 29% in 2010. Election-related spending and the public sector wage bill were the main factors influencing high expenditure overruns in 2013. Despite taking several tax and non-tax revenue measures to fund election expenses, total revenue fell short of budgeted amounts resulting in a fiscal deficit of 2.2% of GDP in 2013. In 2014 expenditure continued to increase partly due to a 14% increase in the public sector wage bill.

Cumulative revenue collections remained below target due to revenue shortfalls mainly caused by company closures and job losses. The AfDB noted that Government expenditures, including loan repayments were higher than targeted due to additional employment costs and higher loan repayments. Employment costs, excluding loan repayments amounted to 80% of total expenditures. They were higher than budgeted as public wages and salaries were increased by the civil service salary review implemented from April 2014. The expenditure mix remained highly unsustainable with current expenditures constituting about 90% of total expenditures.

2. Literature Review

2.1. Theoretical Literature Review

The theoretical foundation of the relationship between fiscal deficits and economic growth consists of three macroeconomic schools of thought: the Neoclassical, Keynesian and Ricardian equivalence.

2.1.1. The Neoclassical "Crowding out Effect"

The Neoclassical view considers fiscal deficits as detrimental to investment and growth as they crowd out private investment. Assuming tax-financed government expenditures, shifting taxes to future generations will lead to fiscal deficits increasing current consumption (Bernheim, 1989). Assuming full employment of resources, the neoclassical assert that increased consumption implies a decrease in savings. The result is a rise in real interest rates so as to bring equilibrium in the capital markets. Higher interest rates, in turn, crowd out private investment hence its reduction implies retardation in economic growth.

2.1.2. The Keynesian "Crowding in Effect"

Keynes' view contradicted the neoclassical proposition of crowding out of private investment. He propounded a counter-argument in support of "crowding-in" of private investment by making reference to the expansionary effects of fiscal deficits. Assuming underemployment of resources, the Keynesians argue that fiscal deficits result in an increase in domestic production, which makes private investors more optimistic about the future course of the economy resulting in them investing more - "crowding in" effect (Bernheim, 1989). According to Saleh (2003), higher public spending may raise the marginal productivity of private capital thereby "crowding in" private investment. He accorded that public capital expenditure such as infrastructure capital like highways, airports, water systems and sewers are likely to bear a complementary relationship with private capital. To this, he concluded that if public capital is complementary to private capital, then investment in public capital will crowd in private investment by raising the return thereof – this will stimulate economic growth.

2.1.3. The Ricardian Equivalence

It builds on the assumptions that (i) individuals are foresighted (ii) individual discount rates on spending are exactly equal to those of government and (iii) individuals have extremely long time horizons for evaluating the present value of future taxes. The theorem suggests that fiscal deficits and taxation have equivalent effects on the economy. A decrease in government saving in the form of a current fiscal deficit leads to an offsetting increase in desired private saving and hence to no change in desired national saving. Since desired national saving does not change, the real interest rate does not have to rise in a closed economy to maintain balance between national saving and investment demand. Hence, there is no effect on investment and no burden of public debt according to Feldstein (1974). In summary fiscal deficits have neutral effects on economic growth according to the Ricardian equivalence.

2.2. Empirical Literature Review

In light of the considerable debate that theory has presented on the impact of fiscal deficits on economic growth, it becomes vital to review the relationship from an empirical point of view.

The empirical literature is reviewed starting from Adam and Bevan (2001), who examined the relationship between fiscal deficits and economic growth for a panel of 45 developing countries, Zimbabwe included. After inspection of the scatter plot, they argued that fiscal deficits are non-linearly related to economic growth. Applying an econometric analysis based on the consistent treatment of the government budget constraint, they found a threshold effect at a level of 1.5% of GDP. They demonstrated that the threshold involved

not only a change of slope, but also a change of sign in the relation regardless of the budget category excluded from the model. This indicated that for an economy not on its steady state of growth path, there is a range over which deficit financing may be growth enhancing.

Incorporating the works of Adam and Bevan (2001), Ezeabasili *et al.* (2012) made efforts to determine the effect of fiscal deficits on Nigerian economic growth during the period 1970 to 2006. Their study however differed from the former in that it assumed a linear relationship between deficits and growth. Using the OLS methodology, fiscal deficits were found to adversely affect economic growth. Thus their findings complemented the neoclassical convention that fiscal deficits retards economic growth through the so-called “crowding out effect”.

Using a different approach, but obtaining the same results was Fatima *et al.* (2011). They made efforts to verify the impact of fiscal deficits on investment and economic growth from 1980 to 2009 for Pakistan. A simultaneous equation model was used on the basis that fiscal deficits directly and indirectly affect growth. The first equation measured the direct effect of fiscal deficit on economic growth while the other equation measured the indirect effect of the deficits on growth. Then using a Two-Stage Least Square (2-SLS) estimation technique, they found that fiscal deficits negatively impact economic growth and also that fiscal deficits dissuade investment leading to deceleration of economic growth.

Applying Cointegration analysis, Mohanty (2013) investigated both the short and long run fiscal deficits and economic growth nexus, on the same continent of Asia using annually time series data for India from 1970 to 2012. The results established a negative and significant relationship between fiscal deficits and economic growth in the long run. The Vector Error Correction Model (VECM) and Granger Causality test, discarded any short run relationship between fiscal deficits and economic growth.

On the contrary, Buscemi and Yallwe (2012) refuted the “adverse” impact of fiscal deficits on economic growth as indicated by the above mentioned neoclassical economists. Basing on an endogenous growth model, they used a reduced form of General Method of Moments (GMM) methodology for dynamic panel data covering 1990 to 2009. Focusing on three emerging countries – South Africa, China and India, they provided what they termed “new empirical evidence” on the impact of fiscal deficits on savings and sustainability of economic growth. This new evidence was that they found fiscal deficit to be significant and positively correlated to economic growth and savings, in contrast to the long believed “adverse effect evidence”. Their results thus supported Keynesian proposition.

Providing diverging evidence, on the deficit-growth relationship were Easterly and Hebbel (1993). Their study focused on ten developing countries, Zimbabwe included. They demonstrated that growth makes deficits less harmful citing the cases of Pakistan and Thailand who sustained large deficits because of strong growth. For Argentina, Mexico and Ivory Coast economic collapse actually exacerbated the macroeconomic effects of deficits. The authors also refuted the Barro-Ricardian model which views fiscal deficits as having neutral effects on economic growth.

In Zimbabwe a study was carried out by Jenkins (1997), with the intention of determining how the deficits affected macroeconomic stability during the 1980s. He also intended to determine the impact that the large permanent deficits faced by the nation then, had on the economy in general and on the poor more specifically. Using a Computable General Equilibrium (CGE) real-effects model deficits were found to have an unambiguously negative impact on exports and hence macroeconomic stability. Also he concluded that deficits lowered private welfare worsening the distribution of income between high and low income earners. Reduction in private consumption, investment and employment were also realized because of the large deficits. Moreover, uncertainty caused by the growing public debt reduced private investment.

Acknowledging the works of Jenkins (1997), was Mashakada (2013) who carried a comparative study of Zimbabwe and selected African countries – Botswana, Ghana, Morocco and Zambia. For the period 1980 to 2008, he examined the macroeconomic effects of fiscal deficits and the contribution of bad governance to macroeconomic instability in the country. He concluded that cumulative fiscal deficits in Zimbabwe since 1980 precipitated macroeconomic instability and fiscal unsustainability. In addition, he contended that, apart from fiscal deficits, political economy issues equally contributed to the economic meltdown of the country.

3. Data Source and Methodology

The study is entirely based on secondary data. The objectives of the study are examined by using time series data covering the period from 1980 to 2015. Relevant data for the study are obtained from ZIMSTAT and World Bank. The objectives of the study are being examined using Unit root test (ADF), Johansen Cointegration Test, Granger Causality test, and Vector Auto Regression Model technique

3.1. Econometric Specification

The study has used the following specifications in order to evaluate the effects of fiscal deficit on economic growth.

The VAR model is specified thus:

$$X_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \dots + \beta_p X_{t-p} + \mu_t$$

where

X_t = (Budget Deficit and Economic Growth) is a 2x2 vector of variables, $\beta_1 \dots \beta_2$ are 2x2 matrices of coefficients and μ_t is a vector of error terms

4. Estimation of Results and Interpretation

4.1. Stationarity Tests

The results of the Unit root tests show that all the variables become stationary after first differencing. This shows that the variables are integrated of the same order thus there was need to test for cointegration using the Johansen cointegration test. However the test for indicated that there is no cointegration (appendix 1) between the two variables thus implying the use of unrestricted VAR model. Table 1 summarises the unit root tests.

Variable	ADF Test Stat	1% Critical Value	5% Critical Value	10% Critical Value	Result
FD	-11.58774	-2.634731	-1.951000	-1.610907	Stationary (1)
GDP	-7.248934	-2.634731	-1.951000	-1.610907	Stationary (1)

Table 1: ADF Unit Root Test results

The Granger causality test is used to determine whether one variable can help to improve the forecast of another. The results of the test are shown in Table 2.

Null hypothesis	Obs	F Statistic	Probability
DFD does not Granger cause DGDP	33	8.74051	0.0011
DGDP does not Granger cause DFD	33	1.93170	0.1637

Table 2: Granger Causality tests

The results in table 2 indicate that there is uni-directional causality between economic growth and Fiscal Deficit. This is so because the null hypothesis of fiscal deficit does not cause economic growth was rejected at the 5% levels of significant. This clearly indicates that fiscal deficit affect economic growth. However, the reverse causality that economic growth causes fiscal deficit was found to be insignificant.

4.2. Estimation Results for VAR

Before the VAR model is estimated, the optimal lag length was chosen using the Akaike Information Criteria (AIC). As Enders (1995) suggested, the optimal lag is selected based on the lowest values of AIC. A VAR with the least AIC was selected and this was found to be 2 (Appendix 2).

4.2.1. Variance Decomposition

Therefore 2 lags were used in the VAR model. Appendix 3 and 4 give the variance decompositions for the variables included in the model. It can be noted that own series shocks explain most of the error variance even though the shock will also affect the other variables in the system. Appendix 3 shows the variance decomposition for fiscal deficit. The results show that less than 10% of the shocks in fiscal deficit are explained by economic growth throughout the periods. This confirms that economic growth do not cause fiscal deficit.

Lastly, the deviations in economic growth are caused by fiscal deficits starting to contribute 36.8% in the first period which increases to an average of 40.4% for period 1 to period 10. This shows that fiscal deficit is an important driver of economic growth as also confirmed by theory. This result suggests that fiscal deficit affects economic growth.

4.2.2. Impulse Response Functions

Appendix 5 shows the impulse response functions for fiscal deficit and economic growth. The response of a variable to itself is highly significant in the initial periods before other variables become influential. The response of economic growth to fiscal deficit is negative and significant only from period 1 to period 4 showing that a higher fiscal deficit has an instant impact to economic growth in Zimbabwe.

5. Conclusion and Policy Recommendations

The study examined the relationship between fiscal deficit and economic growth for the period 1980-2015. Granger Causality and Vector Autoregressive estimation techniques were applied in order to identify the causality and relationship between these variables. In order to assure the reliability of the estimation results, the diagnostic tests were conducted. The regression results revealed that there is a negative relationship between budget deficit and economic in Zimbabwe. This supports the Neoclassical theory which considers fiscal deficits to be detrimental to economic growth.

The results from this study confirm that the fiscal deficit-economic growth relationship is a one way relationship. While fiscal deficit matters for economic growth, the reverse is not equally true. This has a number of policy implications. In line with the IMF propositions the government should reduce the primary deficit as this will help increase international reserves. Achieving sustainable, inclusive growth will require strong macroeconomic and financial policies, an enabling business environment, and normalized relations with creditors.

The top priority remains to reduce public sector employment costs to make room for much needed capital spending to raise growth and social spending to protect the poor. The government needs to direct spending to capital projects rather than recurrent expenditure which is made up of the wage bill to bring about sustainable economic growth. There is also need for the fiscus to strengthen public financial management so as to prevent accumulation of new arrears. ZIMRA missed its revenue target as poor economic conditions affected inflows to the national fiscus thus there is need to mobilise revenue including from the diamond sector.

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APPENDICES

Appendix 1: Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.263014	11.55814	15.49471	0.1794
At most 1	0.044060	1.486996	3.841466	0.2227
Trace test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Appendix 2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-188.5019	NA	1123.742	12.70012	12.79354	12.73001
1	-177.4682	19.86054*	704.0167	12.23121	12.51145*	12.32087*
2	-172.7764	7.819631	675.6127	12.18510*	12.65216	12.33451
3	-167.7707	7.675507	638.9366	12.11805	12.77194	12.32723
4	-166.5536	1.703899	785.1684	12.30357	13.14429	12.57253
5	-164.3903	2.740139	917.6978	12.42602	13.45357	12.75474
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						

Appendix 3: Variance Decomposition of DFD

Period	S.E.	DFD	DGDP
1	5.015044	100.0000	0.000000
2	6.206872	92.86172	7.138281
3	6.679626	90.87721	9.122789
4	6.765882	90.94046	9.059539
5	6.766079	90.93991	9.060090
6	6.773692	90.94041	9.059588
7	6.780086	90.93270	9.067303
8	6.782280	90.92882	9.071176
9	6.782569	90.92859	9.071414
10	6.782570	90.92858	9.071422

Appendix 4: Variance Decomposition of DGDP

Period	S.E.	DFD	DGDP
1	4.124604	0.185864	99.81414
2	5.226823	36.80581	63.19419
3	5.371639	40.10167	59.89833
4	5.377154	40.14094	59.85906
5	5.383179	40.27131	59.72869
6	5.388051	40.32147	59.67853
7	5.390521	40.36303	59.63697
8	5.390906	40.37093	59.62907
9	5.390906	40.37093	59.62907
10	5.390945	40.37165	59.62835

Appendix 5: Impulse Response

