

Government Fiscal Transfers and the Technical Efficiency of Optimising Sustainable Public Debt in Kenya



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ABSTRACT: Over the past decade, as Kenya has consistently made fiscal transfer from the central government to the counties, the country's public debt has continuously become less sustainable. This observation contrasts with the position held in devolution literature that fiscal decentralisation makes the management of public funds more efficient, manifested by improvements in public debt sustainability. This study sought to establish the relationship between fiscal transfers from the central government to the county governments and the technical efficiency of optimising sustainable public debt in Kenya. The study was anchored on the economic theory of technical efficiency. Using a co-relational quantitative research design, a time series analysis was made on secondary data collected over the period 2013 to 2021 from a census enquiry of all the 47 counties of the country. It employed the stochastic frontier analysis technique using the Evsey Domar debt sustainability assessment. Between 2013 and 2021, the technical efficiency of optimising sustainable public debt averaged 12.5% ranging between 87.5% and 0.05%. Over the period, fiscal transfers were found to improve the technical efficiency of optimising the sustainability of public debt ($\beta = -17.224$); the relationship between the two variables was found to be statistically significant ($p = 0.000 < 0.05$). However over the study period, fiscal transfers had a downward trend. The study provides useful information for fiscal transfers policy and recommends that future research examine the relationship between the optimisation of sustainable public debt and the different forms of fiscal transfers.

KEYWORDS: Fiscal, Decentralisation, Transfers, Optimum, Sustainable, Debt

I. INTRODUCTION

Governments ought to ensure that their expenditure is covered by their mainstream public revenues avenues such as taxes and duties. However, in most instances governments are faced with public sector deficits as their expenditures overrun their incomes from these conventional avenues due to planned as well as unintended reasons. These deficits are then covered by borrowing which puts the country into public debt which can turn into a burden for the country when repaying. In literature, the measurement of public debt is made in relative terms with regard to its sustainability or in comparison to the country's economic potential, particularly its potential ability to pay off the debt - the most commonly used relative measure of debt in literature is the ratio of public debt to GDP (Golem, 2010).

In Kenya, like in the other Sub-Saharan African countries, there has been a gradual increase in the level of decentralisation from the time of independence particularly through the process of intergovernmental fiscal transfers from the central government to the counties. The process culminated in the formal adoption of a decentralised system of governance in 2010. (Kaburu, 2013). Over the years, including the period after the official adoption of the decentralised system of government in Kenya in 2010, the level of the country's public debt has continuously risen (Oyugi & Chiraerae, 2011). This state of affairs has been accompanied by a continuous deterioration in the level of public debt sustainability measured by the ratio of public debt-to-GDP.

A. Fiscal Transfers, Technical Efficiency and Sustainable Public Debt

The common conclusion reached in devolutionary discourses is that fiscal decentralisation such as that done through transfers from the central government to the decentralised (county) governments culminates in an improvement in efficiency in public service provision. This suggests that a similar relationship may exist between fiscal transfers and the level of technical efficiency in fiscal management and in particular the management of public debt. However, in Kenya over the past decade simultaneous with the intensification of fiscal transfers: empirical evidence shows that the level of public debt has risen very sharply and the

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country's public debt sustainability status has deteriorated. This suggests that fiscal transfers may after all not have stimulated accountability and technical efficiency to enhance better public debt sustainability in Kenya.

B. Research Hypotheses

The study tested the following hypotheses:

1. H₀₁: There is no statistically significant relationship between the interest-growth rate differential and the technical efficiency of optimising sustainable public debt in Kenya.
2. H₀₂: There is no statistically significant relationship between the primary budget balance and the technical efficiency of optimising sustainable public debt in Kenya.
3. H₀₃: There is no statistically significant relationship between fiscal transfers-decentralisation and the technical efficiency of optimising sustainable public debt in Kenya.

II. LITERATURE REVIEW

Statistics from Kenya, typically agree with the observation that failure to achieve the aims intended for fiscal decentralisation are the result of limitations and restrictions on the decentralised entity concerning the transfer of funds from the central government and concerning appropriate planning and legislation (IBRD, 2014). The cumulative effect of this failure to achieve the aims intended for fiscal decentralisation may have contributed the increase in the fiscal burden on the government and a consequent need for the raising of public borrowing. Various studies demonstrate a positive relationship existing between interest rate charged on total borrowings and internal public debt levels. In Kenya, since her independence, the country has experienced a negative relationship between external public debt and economic growth rate per the findings of several studies such as Achwoga (2016) for the period 1963 to 2015 and Were (2001) covering the period 1970 to 1995, More recently, in an analysis of data for the period between 1996 and 2015, the relationship was affirmed yet again by Gicheru and Nasieku (2016) who found a negative relationship between external public debt and economic growth for

III. RESEARCH METHODOLOGY

A. Research Design

The research used a time series analysis on a dataset of multiple observed counties. Secondary data on the relevant variables were collected on the forty seven counties of the republic of Kenya at yearly time intervals over the period 2013 to 2021. Data was collected from several government non-governmental body databases.

B. The Functional Model

For this study, the stochastic frontier analysis (SFA), an analysis technique that has a stochastic or random effect component was applied. The use of stochastic frontier analysis technique necessitated the selection of a model of appropriate functional form as follows (Laura, 1998):

$$y_{it} = f(x_{it}, t\beta) \cdot \exp(\varepsilon_{it})$$

More specifically, adopting the Evsey Domar public debt sustainability model gave:

$$\ln y_t = \alpha + \beta_1 \ln(1 + \lambda)d_{t-1} - \beta_2 \ln p_t + v_t + \beta_3 \ln \text{trans}_{t-1} + v_i - \mu_i$$

In this function:

$\ln y_t$ = the technical efficiency of optimising sustainable public debt. It was formally estimated by the value of total public debt valued in Kenyan shillings as a percentage of gross domestic product also valued in Kenyan shillings: $y_t = \frac{\text{publicdebt}}{\text{GDP}} \times 100$

α = the intercept term

β_i = the coefficients to be estimated

λ = the excess of real interest rate (r) charged for the debt over real GDP growth rates (g) at the central government level in the period immediately before period t or $(r - g)d_{t-1}$. The real interest rates were measured as the difference between nominal interest rates on funds borrowed externally by the central government and the annual average rate of inflation and were measured in Kenyan shillings.

p = the primary deficit or the excess of central government's expenditure over its revenue as a percentage of the GDP, measured in Kenyan shillings.

trans = fiscal transfers to counties as a percentage of the central government development budget measured in Kenyan shillings.

C. Analysis Procedure

The application of the Stochastic Frontier Analysis technique to the data analysis process was done in two stages. The first stage involved establishing the optimal level of sustainable public debt for Kenya for each year between 2013 and 2021. In this regard,

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the relevant variables used were the interest growth rate differential and the primary budget balance.

The second stage involved an interrogation of the relationship between the varying degrees of fiscal transfers and technical efficiency of attaining the already estimated optimal sustainable public debt level.

IV. RESULTS PRESENTATION AND DISCUSSION

A. Descriptive Statistics - Summary

The means of the variables found are summarised in the following table I

Table I: Variable Means

Variable	Obs	Mean	Type	Min	Max
(Public Debt/GDP %)	dbt	56.9375	Arithmetic	39.8	69.00
(Growth-Interest Differential)	dfr	-1.315797	Arithmetic	0.25	-6.85
(Primary Budget % of GDP)	dfc	7.825	Arithmetic	6.2	9.3
Fiscal Transfer % of Dev't Budget	trn	.3061483	Arithmetic	27.15	33.62

B. Descriptive Statistics - Variable Trends

Over the study period, fiscal transfers received by the county governments from the central government as a percentage of the central government development budget exhibited a generally falling trend from an index of 100% in 2013/2014 to an index of 84.8% in 2020/2021.

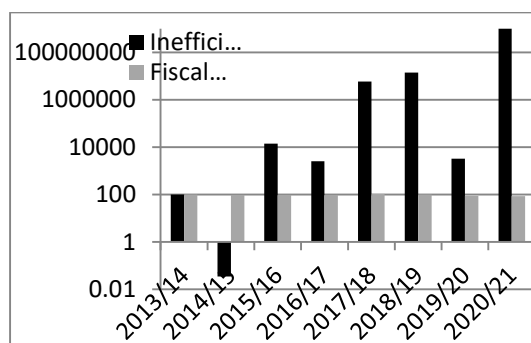


Figure 1: Fiscal Transfer Trend

C. Inferential Statistics - The Ordinary Least Squares Output

The study adopted a 5% level of significance to draw conclusions about the statistical significance of the effects of the selected variable on the technical efficiency of optimising sustainable public debt. The analysis results of the estimated study model after correction for violated Ordinary Least Squares assumptions are shown in table II

Table II: OLS Output:

(Std. Err. adjusted for 47 clusters in id)					
dbt	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
Frontier					
dfr	-1.925927	.0379282	-50.78	0.000	-2.000265 -1.851589
dfc	2.077812	.3056887	6.77	0.000	2.079049 3.274975
yearr	-.0110772	.0025154	-4.40	0.000	-.006147 -.0160074
cons	50.03958	3.462518	14.45	0.000	43.2309 56.84826
mu					
trn	-17.22448	.0420944	-40.60	0.000	-21.08038 -11.20612
_cons	6.177773	.0468386	0.42	0.129	4.2309 6.04826
Usigma					
_cons	4.452977	.0834695	53.35	0.000	4.289379 4.616574
Vsigma					
_cons	-25.49173	.6878913	-37.10	0.000	-26.8384 -24.14585
sigma_u	9.267265	.3867669	23.96	0.000	8.539391 10.05718
sigma_v	2.91e-06	1.00e-06	2.91	0.004	1.49e-06 5.71e-06
lambda	3179874	.3867675	8.2e+06	0.000	3179874 3179875

dbt = public debt as a percentage of GDP

dfr = the interest-growth rate differential

dfc = the primary budget balance expressed as a percentage of GDP

trn = fiscal transfers as a percentage of central government development budget

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The results show that while the excess of public debt interest rate over real GDP growth rate related inversely to optimum sustainable public debt, the central government primary budget balance had a positive influence on the technical efficiency of optimising sustainable public debt as follows.

$$y_t = 50.03958 - 1.925927(1 + \lambda)d_{t-1} + 2.677012 p_t$$

D. Technical Inefficiency

This was the extent of deviation of the observed level of sustainable public debt from the optimum level of sustainable public debt (Lawson *et al.*, 2004).

Formally: $\ln d_t = \beta_0 + \sum_{i=1}^2 \beta_i \ln X_i + \sum_{i=1}^3 \delta_i \ln [v_i + \mu_i]$

$$d_t = e^{\beta_0 + \sum_{i=1}^2 \beta_i \ln X_i} \cdot e^{v_i} \cdot e^{\mu_i}$$

Technical efficiency (TE) = $e^{-\mu}$

(Lawson, *et al.*, 2004; Tijjani, 2006)

On average, in any year during the study period 2013 to 2021 the extent to which the country attained the technical efficiency of optimising sustainable public debt was 12.48% of its full potential. Its trend over the observed years fell as shown in the following analysis output.

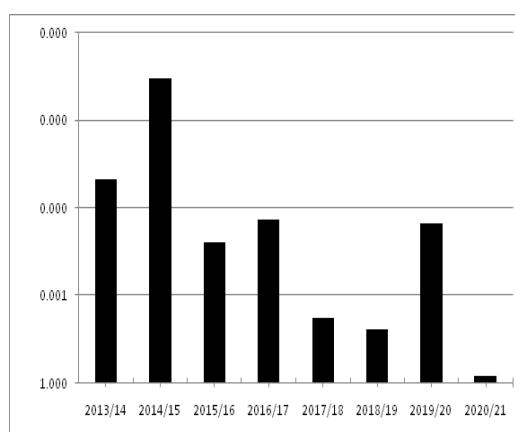


Figure 2: Technical Efficiency Trend

The technical inefficiency model was:

$$\ln \mu_{it} = \delta_0 + \sum_{i,t=1}^n \delta_{it} \ln FD_{it-1} + \omega_{it}$$

And was determined as:

$$\mu_{it} = 6.177773 + 0.142708 Srev_{t-1} + 0.1219097 Sexp_{t-1} - 17.22448 Itrans_{t-1}$$

Equation 4.2

This implies that fiscal transfers (*Itrans*) made to the county governments had the effect of improving the technical efficiency. The reason for this observation may arise more from the fact that the transfers are meant as a cure to the effects of the lopsided manner in which fiscal decentralisation is instituted. In Kenya's, there has been more expenditure decentralisation with little if any accompanying revenue-collection decentralisation. The result has been a high degree of vertical fiscal imbalance where more Table III: Hypotheses Test Results

HYPOTHESIS	COEFFICIENT	Z VALUE	P VALUE	STD ERROR
Interest-growth rate differential has no significant effect on the technical efficiency of optimising sustainable public	-1.925927	-50.78	0.000	.0379282
Primary budget balance has no significant effect on the technical efficiency of optimising sustainable public	2.677012	8.77	0.000	.3050887
Fiscal transfers have no significant effect on the technical efficiency of optimising sustainable public	.0420944	-10.60	0.000	.0420944

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revenue is held by the central government compared to that in the hands of the sub-central government. Governments which have had the experience of a high vertical fiscal imbalance arising from excessive expenditure decentralisation over revenue decentralisation have tried to solve the vertical fiscal imbalance through making fiscal transfers to the county governments (Golem, 2010). This may be the reason why in this study, fiscal transfers enhance the technical efficiency of sustaining public debt. However, a negative side effect of this cure by the government is a reduction in the fiscal discipline of the decentralised government units. Instead of competing to make their expenses lean these decentralised government will instead sit back and wait for (sometimes even fight over) expected central government hand-outs. In some cases, the central government overpays the sub-national government in advance, anticipating that the sub-nationals governments are bound to overspend. The ultimate effect is that a small size of government becomes unachievable and consequently, the technical efficiency of optimising sustainable public debt becomes less attainable.

E. Hypothesis Testing and Analysis of Model Estimators

Summary of Hypothesis Tests

The hypotheses test results are summarised as follows:

Hypothesis H_{01} : Based on the findings the null hypothesis was rejected. Results similar to these have been recorded before. They include: Gicheru and Nasieku (2016), Were (2001) and Achwoga's (2016). The outcome is in conformity with economic theory expectation. A rise in interest rates accompanied by a fall in the growth rate affects the sustainability of public debt adversely. More specifically, Ryan and Maana (2014) found that that within three years a 1 percent increase in economic growth in Kenya reduced the debt-to-GDP ratio by up to 2.5 percent (Ryan & Maana, 2014).

Hypothesis H_{02} : From the findings, the null hypothesis was consequently rejected. This disagreed with the findings of the of Ncube & Brixiová (2016) for the larger sub-saharan Africa region of which Kenya is a part (Ncube & Brixiová, 2016); but agreed with that of William Ng'ang'a *et al* (2016) who determined that a surplus primary balance is positively related to public debt. They reached the conclusion that fiscal consolidation measures (which aid surpluses in the primary balance) positively affect economic growth and macroeconomic stability (Ng'ang'a, Chevallier, & Ndiritu, 2016).

Hypothesis H_{03} : observation of the results led to the rejection of the null hypothesis. It is possible, consistent with this empirical evidence, that fiscal transfers reduce vertical fiscal imbalances, allowing local governments to develop faster over time and raise their capacities of contributing to GDP growth. This could be mitigating the negative effect of the interest-growth rate differential and so having the net effect of enhancing the central government's technical efficiency of optimising sustainable debt level. However, over the study period, fiscal transfers received by the county governments from the central government as a percentage of the central government development budget exhibited a generally falling trend. This is to say that less and less amounts of fiscal transfers (relative to the central government development budget) were made to the county governments, making the country move ever further away from the most technically efficient capacity of optimising sustainable public debt with time.

V. SUMMARY and CONCLUSIONS

A. Study Summary

B. Interest-Growth rate Differential and Budget Primary Balance

It was observed that the interest-growth rate differential had a statistically significantly correlation with the optimal sustainable public debt albeit negatively ($p = 0.000 < 0.01$). The budget primary balance had a positive and statistically significantly correlation with optimal sustainable public debt ($p = 0.000 < 0.01$). The findings of the study were in line with economic theory. Fiscal transfers received by the county governments from the central government were negatively and significantly ($p = 0.000 < 0.01$) correlated with the technical efficiency of optimising sustainable public debt to imply that increases in the fiscal transfers would raise the level of technical efficiency in Kenya although for the actual years under study this variable was actually falling.

VI. STUDY CONCLUSIONS

The study found that: firstly, the country is inefficient with regard to its technical efficiency of optimising sustainable public debt at an annual average of 12.5%. Secondly, the technical efficiency was found to be enhanced by fiscal transfers from the central government to the county governments. Over the years covered by the study, the level of technical inefficiency was seen to rise as the overall degree of fiscal transfers fell. The conclusion was therefore reached that the intensification of fiscal transfers improved the potential of the country's technical efficiency of optimising sustainable public debt.

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