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Nexus between public educational expenditure and economic growth for selected SADC countries

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Abstract

The role of government in financing education is crucial for fostering an educated citizenry that can drive economic growth. This study investigates the relationship between public spending on education and economic growth in selected Southern African Development Community (SADC) countries, highlighting the contentious nature of this relationship in academic discourse. Despite increasing government expenditure on education, challenges such as insufficient infrastructure and outdated pedagogical methods persist, affecting productivity and economic growth. This study employs the Granger causality test and Generalized Method of Moments to analyze the relationship between government expenditure on education and economic growth in SADC countries. The analysis utilizes secondary data from various sources, focusing on the period from 1999 to 2017. The correlation coefficient between educational expenditure and economic growth among selected SADC countries is 0.46, indicating a weak positive relationship. However, the Granger causality test reveals no significant causal relationship between government expenditure on education and economic growth, contradicting findings from other regions. The study concludes that there is no causal link between public spending on education and economic growth suggesting that current educational policies may not align with growth imperatives. It recommends that governments tailor educational curricula to enhance human capital development to improve economic outcomes.

1. Introduction

The government's major role is to provide public goods, including education and health care. Budgetary allocations typically finance these provisions, reflecting the government's priorities and needs. The private sector often complements public spending on education through ownership of some educational institutions. Educational financing is a combination of both public and private institutions, and in some instances, it involves non-governmental organizations. The government's interest in financing education is to ensure that there is an educated citizenry that can assist in developing the country as well as improving industrial productivity, which enhances growth. The government's role in financing education for growth has been a contentious issue in the academic field. Numerous empirical studies have indicated a positive effect of government educational

expenditure on economic growth (Bose, Haque, & Osborn, 2007; Ghose & Das, 2013; Romero-Avila & Strauch, 2008). The World Bank (2013) posits that human capital exerts a more substantial influence on national income than natural or physical capital. Educational development, which improves the quality of human capital, is essential in discussions regarding economic growth.

Research has identified public sector financing of education as an effective role in achieving knowledge and enhancing the innovative capacities of communities and nations. Additionally, supporting education leads to improved efficiency and increased productivity. This then translates to increased income for nations. The World Bank indicates that in modern, technology-driven economies, workers' ability to compete depends on the educational system's performance (World Bank, 2013). There is a need for the acquisition of technological skills due to ever-increasing global competition; hence, the government should be at the forefront of supporting such initiatives through financing education using public resources. Auty (2001) estimated that human capital, represented by human skills and knowledge, accounts for nearly two-thirds of incomes in developing nations. Advocates of the endogenous growth model, including Lucas Jr (1988); Romer (1990) and Barro (1991) contend that education significantly contributes to economic growth. Investment in education enhances individual workforce capabilities and contributes positively to the economy. Nations with significant human capital and increased investments in education or research and development are likely to experience accelerated economic growth. Advocates of the endogenous growth model identify inadequate educational funding as a significant factor contributing to the sluggish growth rates of emerging nations, especially in the Southern African Development Community.

Education influences economic growth in various nations through two primary avenues (Hanushek & Woessmann, 2008). Education improves human capital, which in turn raises labor productivity and eases the growth transition to a higher level of equilibrium production. Furthermore, education enhances the economy's innovative potential, fostering knowledge of new technology, products and processes, hence facilitating growth. The ultimate impact of governmental educational expenditure on economic growth is contingent upon various factors, including the magnitude and allocation of the expenditure. Substantial increases in government educational expenditure often result in heightened negative impacts, perhaps establishing a non-linear relationship between government educational expenditure and economic growth. In these instances, the beneficial impact of governmental educational spending may ultimately be negated (Agénor, 2010; Kosempel, 2004).

This study evaluates the relationship between public spending on education and economic growth in selected SADC countries. The study evaluates the causal relationship between government expenditure on education and economic growth. The association between the two variables is quite controversial, emanating from conceptual and methodological problems (Hanushek & Woessmann, 2008). This study employs total budgetary allocations to education as an indicator of public expenditure on education. It is noteworthy that most of the governments in the SADC region, due to the limited resources, fail to adhere to the Dakar declaration which required that countries should spend at least 20 percent of their budgetary allocations on education. This then calls the question on how the little resources is influencing economic growth or is there reverse causation where the growth rates being achieved in SADC releasing resources for spending in education.

2. Background of the Study

The Southern African Development Community (SADC) is an intergovernmental organization focused on promoting sustainable and equitable economic growth and socio-economic development. This is achieved through efficient production systems, enhanced cooperation and integration, effective governance, and the establishment of lasting peace and security among its Member States. The Southern African Development is largely reliant on the natural resources sector, resulting in its gross domestic product being primarily influenced by agriculture and mining.

The mining sector constitutes around 10 percent of regional Gross Domestic Product (GDP), around 50 percent of total regional export revenues, 60-90 percent of regional foreign direct investment, 15 percent of direct employment, and 15 percent of government revenues (ECA, 2018). The agricultural sector is essential for food and nutritional security, employment, poverty alleviation, and foreign exchange revenues in all member states. Agriculture accounts for 4 to 27 percent of the GDP of member states and averages 13 percent of export profits (ECA, 2018).

Agriculture and mining are important for food security, employment, levels of growth, foreign investment, export earnings, and overall socio-economic development. The countries in SADC are prone to developments in the international markets. Changes in global markets exert pressure on mining and agriculture products, hence affecting their gross domestic product. The region faces greater challenges emanating from exogenous shock due to its dependence on agriculture. It has been noted that economic policy uncertainty imposes another constraint in SADC economies since they tend to undermine business confidence as well as foreign direct investment which is a catalyst for growth. Investment in education will transform efficient labor which will enhance productivity in Agriculture and mining sectors.
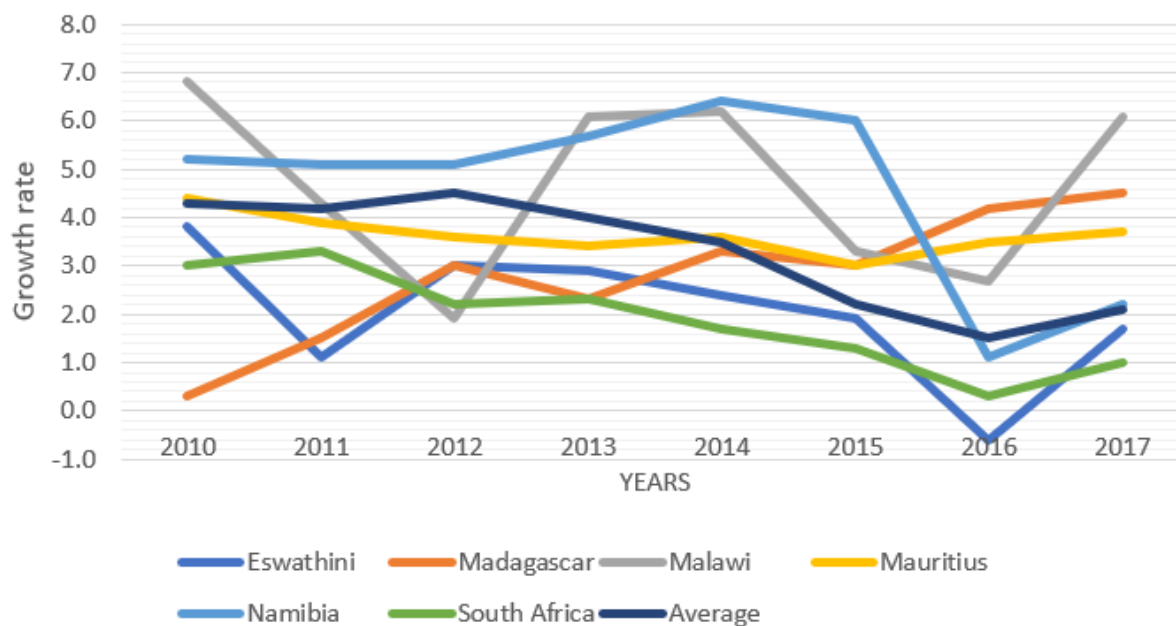
Figure 1. Growth rates in selected SADC countries.

Figure 1 shows the growth rates in the SADC region for the period 2010-2017. It shows that the growth rates were different for the different countries. The average growth rates ranged from 1.5 percent to 4.5 percent during the period. The variation in the growth rates can be explained mostly by the exogenous shocks mostly droughts as well as the movements in commodity prices on the global commodity market.

Like other African regions, the SADC receives most of its funding for education from the national government, which distributes funds for public education according to national priorities and requirements. Public education expenditure priorities vary across nations; however, enhanced investment in education is essential for attaining significant educational goals and developing a skilled workforce (Majgaard & Alain, 2012).

Education financing in SADC is conducted through budgetary allocations, reflecting governmental priorities and requirements. Public expenditure on education is typically complemented by the private sector via private ownership of some educational institutions. Educational financing include both public and commercial institutions, and in certain cases, non-governmental organizations. Notwithstanding the dual finance structure, access to higher education remains inequitable (World Bank, 2013). Notwithstanding this, the government's role in advancing education and research has been remarkable over time, since the funds supplied by the state have been increasing (World Bank, 2018). The correlation between public expenditure on education and advancements in both educational outcomes and workforce development remains a subject of debate. Therefore, to advance towards greater prosperity and economic growth, nations must offer education aligned with contemporary market needs, thereby necessitating increasing governmental expenditure on education.

Government expenditures on education as a percentage of GDP varied from 0.3% to 3.7% throughout the period from 1998 to 2018 (World Bank, 2018). State expenditures on education constituted between 5.0% and 15% of total government expenditure throughout the specified period. The World Bank (2018) reported that during the past 30 years, numerous nations in the sub-region have achieved remarkable progress, with an increasing number of students finishing primary school and a higher enrolment of female students in schools than ever before.

Pulse.ng (2018) argued that there are numerous challenges within the education system in the SADC region. Challenges encompass insufficient infrastructure, outdated pedagogical methods, a considerable number of students leaving without essential knowledge, and inadequate governmental support. The challenges ultimately affect the productivity and GDP growth of these nations. This study seeks to assess the correlation between public spending on education and economic growth.

3. Literature Review

The endogenous growth model introduced by Romer (1986) and Lucas Jr (1988) emphasizes the significance of human capital as a crucial determinant affecting increasing returns and growth rate disparities between developed and developing nations. Mankiw, Romer, and Weil (1992) underscored the critical importance of education as a fundamental element in the enhancement of human capital, a predictor of economic growth. Formal education provides individuals with information that can result in increased income and enhanced economic prosperity. Investing in educated and skilled workers maximizes the usage of labor and capital resources, resulting in improved efficiency. Benhabib and Spiegel (2005) and Nelson and Phelps (1966) affirmed

that education promotes the dissemination and transfer of knowledge crucial for the advancement of new technologies. Pritchett (1991) established a notable negative link between human capital and economic growth.

Kouton (2018) examined the correlation between educational spending and economic growth in Côte d'Ivoire. The research utilized the bounds test approach, the autoregressive distributed lag model, and the Toda and Yamamoto causality test. The study identified a negative and significant long-term effect of government educational spending on economic growth. The findings indicated a unidirectional causal relationship from educational expenditure to economic growth.

Ali Arshad, Hakim, and Abdullah (2016) investigated the relationship between higher education and economic growth using the Granger causality test and Johansen co-integration analysis. The study demonstrates that higher education enrollment growth in Pakistan positively influences gross domestic product. The study identified a unidirectional Granger causal relationship between higher education enrollment and gross domestic product. The study found no causal between higher education enrollment and gross domestic product in Pakistan. Arshad, Roslan, and Hussin (2017b) examined the nexus between government expenditure on education and economic growth in Pakistan from 1980 to 2014. The authors employed the Johansen cointegration test and Granger causality test to examine the relationship. The research indicated a significant long-term positive effect of public education expenditure on GDP. The vector error correction method did not reveal any bidirectional causal relationships in either the short or long term. The study also identified a short run unidirectional causality from public education expenditure to GDP.

Mallick, Das, and Pradhan (2016) analyzed the correlation between educational expenditure and economic growth in key Asian countries. The study employed cointegration analysis and the Granger Causality test to examine the relationship between government expenditure on education and economic growth. The study revealed a positive correlation between educational expenditure and economic growth. The study established a one-way causal relationship from economic growth to educational spending in both the short and long term. (Qi, 2016) assessed the impact of government education spending on economic growth in China. The study established that total spending on education has a positive effect on economic growth. The interesting aspect was that the expenditure on higher education did not have any impact on economic growth. Dissou, Didic, and Yakautsava (2016) assessed the impact of alternative financing on government expenditure in the education sector within a small open economy. The study used a multi-sector endogenous growth model. The research suggested that the various financing mechanisms had varying effects on growth. The transitional impacts of various financing mechanisms on growth differed in the long run. Ramli, Hashim, and Marikan (2016) examined the correlation between government expenditure and economic growth in Malaysia. The study was conducted from 1970 to 2013. The study employed the Cobb-Douglas Production function to construct a Multiple Regression Linear Model. The findings revealed a significant positive correlation between educational expenditure and economic growth. The results indicate that, over time, labor force participation and capital influence economic growth. Abington and Blankenau (2013) investigated the effect of a reallocation with the private and public expenditure on early childhood education. They deduced that education increases the accumulation rate of capital whilst reducing the negative effects of declining growth in labour force. The ultimate effect is dependent on the efficiency of government expenditure on education. Dewan (2012) investigated the connection between Bangladesh's economic growth and public education spending over the long run. Using data from 1995 to 2009, the study used a time series econometric model. The study's results indicated that public spending on education had a positive and significant effect on long-term economic growth. Chandra (2011) used both linear and non-linear Granger Causality methods to examine the relationship between educational expenditure and economic growth in India. The study period was from 1951 to 2009. The results showed that economic growth influences government expenditure on education, while investment in education subsequently influences economic growth. Using Johansson Cointegration and the Toda-Yamato causality technique in VAR analysis, Chaudhary, Iqbal, and Gillani (2009) examined the contribution of higher education to economic growth for Pakistan from 1972 to 2005.

Jung and Thorbecke (2003) investigated the impact of government educational expenditure on human capital, growth and poverty in Tanzania. The study employed the computable general equilibrium model. The study established that educational expenditure by government spurs growth. Gupta (1967) evaluated the effect of government spending on education and health in a number of developing countries using ordinary least squares and two stage least squares. The study found that the effect of government spending had greater effect on education than on health. Health expenditure was found to lead to a reduction in the child mortality. Podrecca and Carmeci (2001) used Granger causality to study the feedback link between economic growth and education in 86 counties between 1960 and 1990. Studies demonstrate that investments in education and the availability of educational institutions substantially affect economic growth. Jaoul* (2004) conducted a study investigating the causal relationship between education and economic growth in France and Germany during World War II. He noted that education impacted Gross Domestic Product in France, whereas it did not much influence economic growth in Germany.

4. Model Specification

This research evaluates the causal relationship between government investment in education and economic growth in SADC countries. The study used the Granger causality test to determine the causal relationship

between government spending on education and economic growth. The study employed panel data Generalized Method of Moments (GMM) to accomplish this aim. The Generalized Method of Moments (GMM) offers several advantages: it leverages the time series characteristics of the data, accommodates firm-specific effects similar to the fixed effect approach, permits the inclusion of lagged dependent variables as regressors, and tackles the endogeneity of all explanatory variables

Studies have employed the causality tests between two variables for investigating the causal effect between public spending on education and economic growth (Asimakopoulos & Karavias, 2016). The current study follows the same method to establish causality between government expenditure on education and economic growth.

To measure the granger causality from economic growth to government expenditure on education, the study employs the equation 1:

$$logEEx = \alpha + \sum_{k}^{K} \gamma_i^{(k)} logEEx + \sum_{k}^{K} \beta_i^{(k)} GDP_{it} + \varepsilon_{i,t} \qquad (1)$$

Where log EEx represents government expenditure on education, GDP represents economic growth, i is from 1 to N cross units, t represents time periods (1, 2, ...T), α represents the intercept, k indicates the number of lags, and ε is the error term, which includes both the disturbance term and the cross-unit specific effects.

To test the Granger non-causality from economic growth to government expenditure on education, the null hypothesis is H_0: $\beta_i = 0$, $for all$ i=1 to N. The alternative hypothesis states that there is causality relationship from economic growth to government expenditure on education for at least one cross-unit of the panel: H_0: $\beta_i \neq 0$, for $i = N_1 + 1, N_1 + 2, ..., N; 0 \leq \frac{N_1}{N} \leq 1$

To measure the Granger causality from government expenditure on education to economic growth, the study employs equation 2:

$$GDP_{it} = \alpha + \sum_{k}^{K} \gamma_i^{(k)} GDP_{it} + \sum_{k}^{K} \beta_i^{(k)} logEEx + \varepsilon_{i,t} \qquad (2)$$

As discussed above to test the Granger non-causality from government expenditure on education to economic growth, the null hypothesis is H_0: $\beta_i = 0$, $for all$ i=1 to N. The alternative hypothesis states that there is causality relationship from financial inclusion to economic growth for at least one cross-unit of the panel: H_0: $\beta_i \neq 0$, for $i = N_1 + 1, N_1 + 2, ..., N; 0 \leq \frac{N_1}{N} \leq 1$

The Granger causality equations (1 and 2) was estimated using the two-stage generalized method of moments (GMM) panel estimation technique, which is designed specifically for tackling auto-regressive properties in the dependent variable when lagged values are included as explanatory variables. The study method follows the frameworks by Arellano and Bond (1991); Arellano and Bover (1995) and Blundell and Bond (1998) addressing issues related to endogeneity and measurement error.

Government total expenditure on education as a % of GDP was used to represent educational expenditure. The reason for this is that other proxies like current education expenditure, government expenditure per student and government expenditure on education (total % of government expenditure) have missing data for the panel.

GDP per capita – is used to represent economic growth. This data is very much accessible from the World Bank Database. The reason GDP per capita was used as a proxy instead of GDP or GDP growth is because it takes into account the population of a nation thereby providing insights on a country's domestic population influence which is not the case for other proxies of economic growth. Also, the measure is available globally.

The study used secondary data from several databanks including the United Nations Educational, Scientific and Cultural Organization (UNESCO), various SADC Statistics Year Books and National Statistics official sites. The study managed to determine relationship between public spending on education and economic growth in selected SADC countries namely: Namibia, Madagascar, Malawi, Mauritius, South Africa and Eswatini due to the problem of data constraint. The period of the study spans 19 years from 1999 to 2017.

5. Results Presentation and Analysis

This section presents the main results of the paper. Table 1 shows the correlation coefficients between expenditure on education and economic growth. The tables show that the correlation coefficient between expenditure on education and economic growth among the selected SADC countries is 0.46. This implies that there is a weak positive relation among the variables in question. In other words, economic growth and educational expenditure trend together though very weakly.

Table 1. Correlations matrix.

Variable	Edd	gdp
Edd	1.000	0.436
Gdp	0.436	1.00

Table 2 shows the results of the granger causality test between government expenditure on education and economic growth among selected SADC countries. The results reveals that there is no causality between

government expenditure and economic growth among SADC countries. This implies that neither economic growth leads to changes in educational expenditure or vice versa, i.e. governmental expenditure on education does not spur economic growth. This supports the notion presented in Table 1 that shows weak correlation among the variables of interest. The results of the study contradicts other studies that have been done elsewhere for individual countries or regions which found that there was causality among government expenditure on education and economic growth (Abington & Blankenau, 2013; Ali Arshad et al., 2016; Dissou et al., 2016; Kouton, 2018; Mallick et al., 2016; Ramli et al., 2016).

Table 2. Granger causality test results.

Variable	Dependent variable: Edd	Dependent variable: Gdp
edd(-1)	0.756	-0.076
	(0.000) ***	(0.368)
edd(-2)	0.123	-0.076
	(0.240)	(0.368)
gdp(-1)	-0.073	1..010
	(0.513)	(0.000) ***
gdp(-2)	0.092	-0.872
	(0.407)	(0.016)
Constant	0.017	0.024
	(0.694)	(0.505)
R-squared	0.794	0.990
DW	2.013	2.016
Wald test	edd(-1) = edd(-2) =0	gdp(-1) =gdp (-2)=0
Chi-square	2.658	1.213
	(0.265)	(0.540)

Note: ***represents significance at 1%.

The lack of causality is clarion call to the policy makers in SADC to relook at their curriculum and match it with the countries requirements since promoting the uptake of education represents increased human capital of that country, leading to improved efficiency and strengthened production capacity. This will dovetail well with the developments currently taking place in different SADC countries for example Zimbabwe where the government is revamping university education towards Education 5.0 where universities are now supposed to concentrate on teaching, research, community service, innovation and entrepreneurship. Such a thrust is in line with the arguments by Hanushek and Woessmann (2008) who is of the view that education should increase the human capital which increases labor productivity and transitional growth toward a higher equilibrium output level. Further education should spur the innovative capacity of the economy, knowledge of new technologies, products and processes, and thus promotes growth.

6. Conclusion

The study sought to answer the question does public spending on education affect or cause economic growth in the SADC Countries. The study established that there was no causality between government expenditure on education and economic growth. This implies that economic growth and government expenditure has no relationship. This implies the current government policies on education in the SADC countries are divorced from the growth imperatives of these countries. The policy implication from the study is that the different governments in SADC should tailor make their curriculum to match the demand of the industries as well as governments direction of increasing growth.

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