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The problem of economic growth in Sub-Saharan Africa – The case of Ghana, Republic of Congo, Kenya and Lesotho

Senanu Kwasi Klutse

A wide range of policy-related variables have a persistent influence on economic growth. This has consistently maintained the interest of economists on the determinants of economic growth over the years. There is consensus however that for countries to grow sustainably, a lot of stall must be placed on higher savings rate as this makes it easy for such countries to grow faster because they endogenously allocate more resources to inventive activities. Due to data difficulties in Sub-Saharan Africa (SSA) it is nearly impossible for one to consider important variables such as accumulation of knowledge and human capital when analysing growth sustainability.

Studying four lower middle-income countries in SSA – Ghana, Republic of Congo, Kenya and Lesotho – this study tests the hypothesis of sustainable growth by using a Dynamic Ordinary Least Square (DOLS) model to examine the relationship between savings, investment, budget deficit and the growth variable. The results showed that savings had a significant but negative relationship with the GDP per capita (PPP). A Granger Causality test conducted showed that savings does not granger cause GDP per capita (PPP), the HDI index, deficit and investment. This leads to the conclusion that growth in these countries are not sustainable. The study recommends that policy makers focus on the savings variable if these countries will want to achieve sustainable growth.

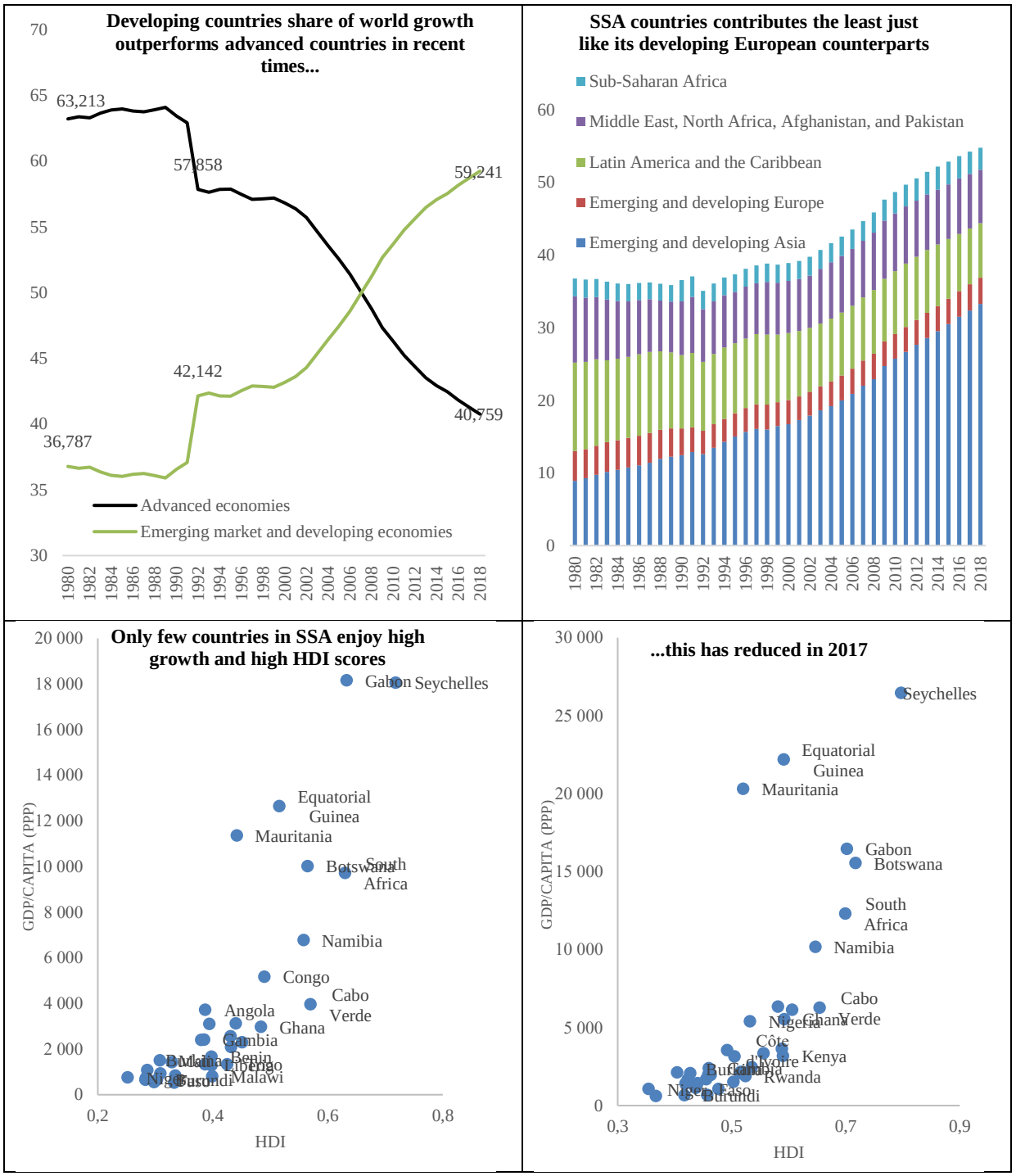
Keywords: Savings, Investment, GDP per Capita

1. Introduction

Aggregate economic performance in Sub-Saharan Africa (SSA) during the past decade have been robust. In most of these countries, high economic growth has translated into improved standard of living translating into poverty reduction and improved social indicators. In some of these countries (SSA) progress in these areas has fallen short of expectations. Despite this SSA is seen as the engine of World growth in the foreseeable future. A glance at various economic indicators will show that current growth in SSA is not leading to the desired improvements in the standard of living of its populace (see Figure 1).

Both domestic and external factors have contributed to this disproportionate overall performance. The external environment, characterized by sharp declines in world commodity prices and substantial losses in the terms of trade, has been generally unfavourable. Most countries in the SSA region have been confronted with deep-rooted developmental constraints including low human capital development and inadequate infrastructure which have constituted major impediments to private sector development and the supply response of economies in general (Ghura–Hadjimichael 1996).

Figure 1 Performance of SSA countries (selected indicators)



Source: own construction based on IMF and World Bank data

Though literature has been debating factors that are likely to keep developments of countries sustainable over long periods of time, there appear to be a consensus that economies with higher savings rate grow faster because they allocate (endogenously) more resources to inventive activities (Helpman 2004). The view that investment drives savings cannot also be ignored in this regard. These studies have however failed to link their findings to the issue of growth sustainability.

By using Ghana, Republic of Congo, Kenya and Lesotho as case studies this paper tested the hypothesis that the deficit, savings and investment have a significant effect on per capita GDP growth adjusted for by the purchasing power parity. The analysis showed that savings does not granger cause economic growth, the deficit and investment. The DOLS model estimated showed significant but negative relationship between the GDP per capita and all variables considered. The HDI on the other hand produced mixed results. These results point to the issue of sustainable growth which is expected to be driven by savings which is also the main catalyst for investment and growth. The Harrod –Domar growth model was thus not confirmed in this study.

The rest of this paper discusses various literature on the subject, the type of data and methodology employed, discussion of results and conclusion.

2. Theoretical Background and Literature Review

Growth has important implications for the welfare of individuals. In fact, aggregate growth is probably the single most important factor affecting individual levels of income. Data will suggest that the average person on the planet has been getting richer over time. A careful look at the data will reveal that inequality has increased along with economic growth (Barro et al. 2003). The emphasis over the years have been on the accumulation of physical (stock of machines, equipment and structures) and human (stock of education and training embodied in the labour force) capital as major forces behind income growth (Helpman 2004). This was an attempt to try and investigate why some countries are better off than others – a phenomenon Helpman (2004), refers to as the "two polarized clubs". This early attempt assumed technological change to be outside the influence of economic incentives (exogenous process). It focused more on the accumulation of physical and human capital.

Economists of the late 1950s led by Solow (1956, 1957), came out with the idea that growth of output can be decomposed into components that can be attributed to the growth of inputs and a residual growth rate that is not attributed to the growth on inputs (neoclassical growth model). The growth of output exceeds the contribution of inputs. The difference between the two is the rate of growth of total factor productivity. Like the early models of growth, the early proponents of the neoclassical growth models did not premise their arguments on technological change.

The neoclassical models without technological change predicts that the economy will converge to a steady state with zero per capita growth – the diminishing returns to capital problem. One way out of the problem was to broaden the concept of capital notably to include human components and then assume that the diminishing returns did not apply to this broader class of capital – the non-rival nature of technology problem (Barro et al. 2003).

Romer (1986) and Lucas (1988) discovered that the model proposed by Solow (1956, 1957) predicts declining growths which contradicts the real-world situation were growth rates has accelerated overtime. They proposed models that emphasizes externalities in the accumulation of knowledge and human capital respectively (Helpman 2004). The idea here is that the stock of knowledge rises over time as firms invest in knowledge accumulation. Therefore, each firm has an incentive to invest in private knowledge. However, this investment contributes to the aggregate public stock of knowledge hence the externality. For externalities in human capital Lucas's (1988) model, viewed human capital as a measure of skills that can expand without bound. Under these circumstances human capital accumulation can serve as a source of permanent long-run growth. This according to him was a better measurement compared to empirical researchers use measures of human capital that are based on years of schooling. In this event, human capital per person cannot grow without bound, because individual lifetimes are finite. As a result, the growth of human capital cannot be a source of permanent economic expansion.

The clear distinction between the growth theory of the 1960s and that of the 1990s is that recent research pays close attention to empirical implications and to the relationship between theory and data. However, it still requires empirical hypothesis from the older theory, notably the neoclassical growth model's prediction of conditional convergence (Barro et al. 2003). Developed economies have the capabilities to measure these indicators – human capital as a measure of skills and knowledge. For instance, in attempt to measure knowledge, it is assumed the Research and Development (R&D) creates new knowledge. As a result, if knowledge externalities do exist, they should show up in R&D activities. Here the private return of R&D depends on institutional features such as the length of patent protection. The stock of knowledge available to innovators is a function of past R&D efforts making it cheaper to do R&D today. R&D is effectively captured in the fiscal statements of most developed and advanced countries. The same cannot be said for most developing countries.

Romer (1990), identified technological features that lead to the balancing of these forces so that the incentive to innovate remains constant over time and as a result the resources deployed to R&D activities remain constant as well. An economy that follows this type of trajectory experiences a constant rate of productivity growth. Arguably, economies with higher savings rate grow faster because they allocate (endogenously) more resources to inventive activities – R&D (Helpman 2004). Helpman (2004), showed that productivity is even more important than these factors in explaining income differences and growth rate differences across countries. Thus, to understand the sources of economic growth, one must understand what causes productivity – the size of the coefficient that converts natural units of the inputs such as hours of labour or acres of land, into effective units of the inputs – growth.

Fujita (2016), Tang and Tan (2017), Agrawal (2001), Mohan (2006) and Saltz (1999) have all conducted studies to investigate the linkages between savings and economic growth in developed and developing economies. The causal relationship between savings and economic growth has also been studied in Sub-Saharan Africa (SSA). Odhiambo (2008, 2009) tested this relationship in Kenya and South Africa.

He used causality and co-integration test to analyse the relationship between the variables. The results showed a positive relationship between savings and economic growth in both countries.

In analysing this relationship in Sub-Saharan Africa (Kenya, Zimbabwe and Botswana), Elbadawi and Mwega (2000) showed that savings granger causes the increase in investment in these countries. They found at the time that Botswana was a country with lower private saving rate. Anoruo and Ahmad (2001) on the other hand investigated the relationship between savings and economic growth in Congo, Cote Ivoire, Ghana, Kenya, Nigeria, South Africa and Zambia using a vector error correction model. The result indicated that there is a long run relationship between economic growth and saving. Jagadeesh (2015) in his study of the relationship between savings and economic growth in Botswana found that there is significant relationship between Savings and Economic growth and the study supported Harrod Domar growth Model.

These studies notwithstanding, the causal relationship between savings and economic growth remains mixed. Just as corporations tend to fund themselves first by drawing upon internal funds, households and to some extent governments are expected to address funding problems by first relying on their savings (Setterfield–Kim 2016). The view that investment drives savings cannot also be ignored. This view is a Kalecki-Keynes theory which is different from the orthodox theory which states that savings rather drives investment. Atkinson and Hamilton (2003), explains the link between savings and natural resources by postulating that the measurement of sustainability is the finding of a negative and significant relationship between natural resource abundance and economic growth – which he terms the resource curse hypothesis. They conclude that countries that had lagged in terms of growth are those where among others have a low rate of genuine saving – net saving adjusted for resource depletion.

In investigating the determinants of per capita economic growth for a large sample of sub-Saharan African countries during 1981–1992, Ghura and Hadjimichael (1996) found that an increase in private investment has a positive impact on per capita growth and that growth is stimulated by public policies that lower the budget deficit in relation to GDP – without reducing government investment.

Taking note of the above literature it is clear the situation in developing countries is quite unique. Data availability problems on other important variables used to access the inclusiveness of the growth of a country is almost non-existent in SSA. This confirms the reason why studies in the SSA area focused on the savings, investment and the growth variable. These studies however did not consider the issue of growth sustainability. They were only interested in finding the relationship between these variables ignoring its implications. In other to bridge the gap in literature, this study poses the question whether it is possible for an economy to enjoy positive growth rates by simply saving and investing in capital stock? The focus will be on lower middle-income countries in SSA for which data is available. The objective will be to identify the relationship between savings, investment, budget deficit and the growth variable. This will be expected to give an indication of whether growth in these countries are sustainable or not.

3. Data and Methodology

The clear distinction between the growth theories of the 1960s and that of the 1990s is that recent research pays close attention to empirical implications and to the relationship between theory and data. However, it still requires empirical hypothesis from the older theory, notably the neoclassical growth model's prediction of conditional convergence.

Barro et al. (2003) used a 3 Stage Least Squares method to show how growth impacts the welfare of individuals. The dependent variable in their case was the growth rates per capita GDP. The explanatory variables included the log per capita GDP, male upper leaving schooling, squared openness ratio, inflation rate and some dummies.

Other studies have used different methods to establish the relationship between savings and the growth variable. Jagadeesh (2015) applied the Harrod–Domar growth model to the economy of Botswana based on an Auto Regressive Distributed Lagged (ARDL) model to check the existence of a long run relationship between Gross Domestic Product and Gross Domestic savings. Tang and Tan (2017), Odhiambo (2008, 2009), Elbadawi and Mwega (2000) and Anoruo and Ahmad (2001) all used causality tests to establish the relationship between savings and the growth variable. They found that savings and investment both granger cause growth. In the case of Anoruo and Ahmad (2001), a vector error correction model was also used.

Using a modification of the model proposed by Barro et al. (2003) and the Harrod –Domar growth model, this study will test whether the deficit, investment and savings have any significant relationship with the growth variable. Unlike Barro et al. (2003), the models will not include other social indicators. As discussed earlier a good model will definitely have to account for many factors – R&D, labour productivity, openness ratio and etc. These other factors are hard to measure bearing in mind also how to appropriately weigh each of them. In the case of SSA countries the possibility of having verifiable data on these other social variables is next to zero. In this case the Harrold-Domar model is the suitable model to be used to show this relationship. The theory describes a mechanism by which more savings leads to more economic growth because savings leads to investment and it leads to capital formation.

We will thus assume that for developing countries to achieve economic growth, the government in that country need to encourage savings bearing in mind also the importance of other factors.

Out of a population of twelve (12) SSA countries classified by the World Bank in 2018-2019 to be lower middle-income countries, this study will focus on a sample of four (4) countries out of the 12 – data availability was a limiting criterion. Data for this study was sourced from the International Monetary Fund's (IMFs) World Economic Outlook (WEO) database released in April, 2019 and also the World Bank's Human Development index.

The regression equations to be estimated are as follows:

$$\mathrm{LnGDP\_CAP\_PPP_t} = \alpha + \beta \mathrm{DEF_t} + \gamma \mathrm{LnSAV_t} + \lambda L n \mathrm{INV_t} + \mu_t \quad (1)$$

$$\mathrm{HDI_t} = \alpha + \beta \mathrm{DEF_t} + \gamma \mathrm{LnSAV_t} + \lambda \mathrm{LnINV_t} + \mu_t \quad (2)$$

where the GDP_CAP_PPP is the Gross domestic product per capita at constant prices (Purchasing power parity; 2011 international dollars) thus, GDP expressed in constant international dollars per person. Data is derived by dividing constant price purchasing-power parity (PPP) GDP by total population. DEF is the budget deficit – expressed in US$ – calculated as revenue minus total expenditure. This balance may be viewed as an indicator of the financial impact of general government activity on the rest of the economy and non-residents. SAV is the gross national savings expressed in percentage of GDP. It is gross disposable income less final consumption expenditure after taking account of an adjustment for pension funds. INV is total investment expressed in percentage of GDP. It is measured by the total value of the gross fixed capital formation and changes in inventories and acquisitions less disposals of valuables for a unit or sector.

A Johansen Fisher Panel Cointegration Test was conduct on the data set with a no deterministic trend assumption. The results showed that there were at most three cointegrated relationships between the variables in the data set. Due to this result, this study adopts a cointegrated panel regression model - Panel Dynamic Least Squares (DOLS) – which is robust in handling variables that are cointegrated.

The DOLS model used here is an extension of the models proposed by Saikkonen (1992) and Stock and Watson (1993) which was applied to a panel data settings. This can be achieved by augmenting the panel cointegrating regression equation with cross-section specific lags and leads of ΔX_{it} to eliminate the asymptotic endogeneity and serial correlation. For the pooled DOLS estimator, an OLS method is used to estimate an augmented cointegrating regression equation of the form below.

$$y_{it} = X_{it}'\beta + \sum_{j=-q_i}^{r_i} \Delta X_{it} +'_j \delta_i - \upsilon_{1it} \tag{3}$$

Where y_{it} and X_{it} are the data purged of the individual deterministic trends. The short-run dynamics coefficients δ_i are allowed to be cross-section specific. The pooled DOLS estimator may be written as

$$\begin{bmatrix}\hat{\beta}_{DP} \\ \hat{\gamma}_{DP}\end{bmatrix} = \left(\sum_{i=1}^{N}\sum_{t=1}^{T} W_{it}W_{it}'\right)^{-1}\left(\sum_{i=1}^{N}\sum_{t=1}^{T} W_{it}y_{it}'\right) \tag{4}$$

$$W_{it}' = (X_{it}', Z_{it}')' \tag{5}$$

Where Z_{it} are the regressors formed by interacting the ΔX_{it+j} terms with cross-section dummy variables. To estimate the asymptotic covariance matrix of $\hat{\beta}DP$, we use the following sub-matrix of:

$$V_{DP} = \hat{\omega}_{1.2} * \hat{M}_{DP}^{-1} \tag{6}$$

Where

$$\hat{M}_{DP} = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{1}{T^2}\sum_{t=1}^{T} W_{it}W_{it}'\right) \tag{7}$$

And $\hat{\omega}_{1.2}$ is an estimator of the long-run residual variance.

4. Results and Analysis

The regression result is shown in Table 1 below. It shows that there is a negative relationship between the deficit to GDP; the log of savings; and the log of investment; and the log of GDP per capita. Among these, savings and investment had significant relationships with the GDP per capita. This will mean that savings and investment in these countries do not lead to economic growth as measured by the GDP per capita. This as mentioned earlier is implied in the negative relationship between the variables. The relationship between the deficit and the GDP per capita was as expected – negative – as an increase in the budget deficit hurts economic growth through expected taxation or borrowing in the future to cover the financing gap in a developing country setting. This relation was however not significant.

The HDI on the other hand had a positive relationship with the deficit and just like in the case of the GDP per capita was not significant in explaining and improvement in economic wellbeing in these countries. In the same vein there was also a non- significant and positive relationship between the HDI and investment in these countries, confirming the fact that investments in these countries were not significant in determining economic growth. Like in the case of equation 1, there is a significant but negative relationship between savings and the HDI. In this case the Harrold-Domar model cannot be substantiated as it appears more savings in these countries does not lead to economic growth or economic wellbeing. The reasons for the negative relationships could stem from the fact that the savings in these countries are not domestic in nature and also the profitability of the investments opportunity they offer may be very limited. Studies have it that the use of domestic savings for investment improves economic growth (Prasad and Rajan 2008).

Table 1 Regression output for equation 1 and 2

	Dependent Variable	
Independent Variable	LnGDP_CAP_PPP	HDI
DEFICIT_GDP	–0.00045	0.00007
	(–0.50723)	(0.24196)
LnSAV	–0.06461	–0.02042
	(–3.59771)*	(–3.70271)*
LnINV	–0.08357	0.01258
	(–3.25061)*	(1.59368)
R-squared	0.99879	0.99224

t-statistics in parenthesis (); Significance level: *1%, **5%, ***10%
Source: own construction

Adjusting at lag 2, a Granger Causality Test conducted on the variables showed that economic growth granger causes the deficit, economic growth granger causes the HDI, investment granger causes the deficit, the deficit granger causes the HDI, investment granger causes savings and investment granger causing the HDI in these countries. However savings does not granger cause economic growth, HDI and the deficit and investment. This supports the findings of the DOLS model employed in this study. The problem of unsustainable growth.

5. Conclusion

According to the Sub-Saharan Africa Regional Economic Outlook by the IMF, human development indicators have generally evolved in line with changes in the GDP per capita as shown in Figure 1 above. Countries that have experienced the largest increases in incomes and human development include those rich in mineral resources including Ghana as well as countries that are not primary commodity exporters. The question as to whether this type of development is sustainable flows from economic theory on the subject that the economy will converge to a steady state with zero per capita growth – the diminishing returns to capital problem. The consensus on this involves models that emphasizes externalities in the accumulation of knowledge and human capital respectively (Helpman 2004).

Data on these indicators is difficult to come by when it comes to SSA. As a result, this study resolved the issue of sustainable growth by exploring the assumption that economies with higher savings rate grow faster because they allocate (endogenously) more resources to inventive activities (Helpman 2004, Fujita 2016).

A DOLS model was used to test the relationship between economic growth, deficit, savings and the investment variable. The results point to unsustainable growth in these countries as there was a significant negative relationship between economic growth and the savings variable contrary to studies by Odhiambo (2008, 2009) and Jagadeesh (2015) who found positive relationship between savings and economic growth. The results were confirmed by a granger causality test which showed that savings does not granger causes economic growth and the other variables considered in this study. This conclusion is at variance with the findings of Tang and Tan (2017) and Elbadawi and Mwega (2000). If this countries want to achieve sustainable growth then primacy must be given to the savings variable – the domestic component. Through domestic savings, these countries have an option to invest in the productive sectors of their economies. As discussed in the reviewed literature above, productivity appears to be even more an important factor in explaining income differences and growth rate differences across countries. Thus, to understand the sources of economic growth, one must understand what causes productivity – the size of the coefficient that converts natural units of the inputs such as hours of labour or acres of land, into effective units of the inputs – growth.

Reference

Agrawal, P. (2001): The relation between savings and growth: cointegration and causality evidence from Asia. *Applied economics*, 33, 4, 499–513.

Anoruo, E. – Ahmad, Y. (2001): Causal relationship between domestic savings and economic growth: Evidence from seven African countries. *African Development Review*, 13, 2, 238–249.

Atkinson, G. and Hamilton, K. (2003): Savings, growth and the resource curse hypothesis. *World development*, 31, 11, 1793–1807.

Barro, Robert J. – Sala-i-Martin, X. (2003): *Economic growth*. MIT Press

Elbadawi, I. A. – Mwega, F. M. (2000): Can Africa's saving collapse be reversed? *The World Bank Economic Review*, 14, 3, 415–443.

Fujita, Y. (2016): Piketty's Capital-Income Theory Reconsidered for a Small Open Economy with Increasing Savings Rate. *Open Journal of Statistics*, 6, 01, p. 25.

Ghura, D. – Hadjimichael, M.T. (1996): Growth in Sub-Saharan Africa. *Staff Papers*, 43, 3, 605–634.

Helpman, E. (2004): *The Mystery of Economic Growth*. Belknap by Harvard University Press, Cambridge MA.

Jagadeesh, D. (2015): The impact of savings in economic growth: an empirical study based on Botswana. *International Journal of Research*, 10.

Lucas Jr, R. E. (1988): On the mechanics of economic development. *Journal of monetary economics*, 22, 1, 3–42.

Odhiambo, N. M. (2009): Savings and economic growth in South Africa: A multivariate causality test. *Journal of policy Modeling*, 31, 5, 708–718.

Prasad, E. S. – Rajan, R. G. (2008): A pragmatic approach to capital account liberalization. *Journal of Economic Perspectives*, 22, 3, 149–72.

Romer, P. M. (1986): Increasing returns and long-run growth. *Journal of political economy*, 94, 5, 1002–1037.

Romer, P. M., (1990): Endogenous technological change. *Journal of political Economy*, 98, 5, Part 2, S71–S102.

Saltz, I.S. (1999): An examination of the causal relationship between savings and growth in the third world. *Journal of Economics and Finance*, 23, 1, 90–98.

Setterfield, M. – Kim, Y. K. (2016): Debt servicing, aggregate consumption, and growth. *Structural Change and Economic Dynamics*, 36, 22–33.

Saikkonen, P. (1992): Estimation and testing of cointegrated systems by an autoregressive approximation. *Econometric theory*, 8, 1, 1–27.

Stock, J. H. – Watson, M.W. (1993): A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica: Journal of the Econometric Society*, 783–820.

Solow, R. M. (1956): A contribution to the theory of economic growth. *The quarterly journal of economics*, 70, 1, 65–94.

Solow, R. M. (1957): Technical change and the aggregate production function. *The review of Economics and Statistics*, 312–320.

Tang, C. F. – Tan, E. C. (2017): Re-visiting the Savings-Led Growth Hypothesis and Its Stability in East Asian Economies. *International Economic Journal*, 31, 3, 436–447.

Appendix

Table 1 Pairwise Dumitrescu Hurlin Panel Causality Tests on Variables – Lag 2

Null Hypothesis:	**Prob.**
DEFICIT__GDP does not homogeneously cause LnGDP_CAPITA	0.4262
LnGDP_CAPITA does not homogeneously cause DEFICIT__GDP	0.0498
LnINV does not homogeneously cause LnGDP_CAPITA	0.0705
LnGDP_CAPITA does not homogeneously cause LnINV	0.5734
LnSAV does not homogeneously cause LnGDP_CAPITA	0.2325
LnGDP_CAPITA does not homogeneously cause LnSAV	0.9416
HDI does not homogeneously cause LnGDP_CAPITA	2.E-10
LnGDP_CAPITA does not homogeneously cause HDI	5.E-08
LnINV does not homogeneously cause DEFICIT__GDP	0.0021
DEFICIT__GDP does not homogeneously cause LnINV	0.7670
LnSAV does not homogeneously cause DEFICIT__GDP	0.5784
DEFICIT__GDP does not homogeneously cause LnSAV	0.2612
HDI does not homogeneously cause DEFICIT__GDP	0.1504
DEFICIT__GDP does not homogeneously cause HDI	0.0062
LnSAV does not homogeneously cause LnINV	0.6489
LnINV does not homogeneously cause LnSAV	0.0354
HDI does not homogeneously cause LnINV	0.2947
LnINV does not homogeneously cause HDI	3.E-05
HDI does not homogeneously cause LnSAV	0.7270
LnSAV does not homogeneously cause HDI	0.3095

Source: own construction