Empirical Evidence on the Causal Relationship between Savings and Economic Growth in Kenya

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Abstract: *This study set out to establish the determinants of savings in Kenya and the causal relationship between savings and economic growth, whether higher growth leads to higher savings in the long run. The results derived from the study indicate that the positive relationship between savings and economic growth can be attributed to a causal relationship whose direction is from growth to savings, rather than from savings to growth. Therefore, growth has significant impact on savings and indeed higher growth will lead to increased savings in the long-run.*

Keywords: Causal Relationship, Savings, Economic Growth

1. Introduction

The relationship between savings and economic growth has attracted a lot of interest in recent times among academicians and policymakers. The debate has been whether to prioritize higher savings mobilization policies, or economic growth policies, or whether to pursue both policies at the same time. Most of the growth theories have demonstrated the presence of a positive relationship between savings and economic growth. For example, the Harrod (1939) model shows that the growth of an economy has a positive relationship with its savings and a contrary relationship with its capital output ratio. Other growth models such as Domar (1946) have also argued that higher savings lead to higher investments, which in turn stimulate economic growth. This is because an increase in savings boosts steady-state output by more than its direct impact on investment, because higher output means more saving and investment, which compounds the rate of growth more. Higher savings also provide a buffer against possible macroeconomic crisis. However, some studies have cast doubt on these savings-driven economic growth models and have argued that economic growth promotes savings and not vice versa (Carroll & Weil, 1994; Mohan, 2006; Odhiambo, 2008; Sinha & Sinha, 1998). They argue that an improvement in the economy puts more money in people's pockets thus they are able to save more. Other studies have not found any significant causal relationship between savings and economic growth (Sothan, 2014; Mavrotas & Kelly (2001).

Savings behavior shows considerable variation across countries depending on their socio-economic structure. Thus, the results of pooled studies, which are applicable to the average country sample, may not apply to the particular country in question. Thus, cross country analysis based on the assumption of homogeneity is not appropriate in some instances. Given the vast differences among countries with respect to structural institutional aspects and also the quality of data, cross-country comparison and estimation is fraught with danger. It is evident therefore that country specific studies are important, to analyze the causality between savings and growth, in addition to the overall determinants.

The theoretical literature is unclear about the direction of the relationship as well as the nature of association between savings and growth (Agrawal & Sahoo, 2009). Similarly, on the empirical side also, there is no clear conclusion about the direction of causality between the growth rate and savings rate. While some studies have found the causality running from savings to economic growth, others have found that growth determines savings. It is in this context that this study undertakes an econometric analysis of the direction of causality between savings and growth.

Kenya's savings rate has been on the decline over the last four decades. For instance, during the period 2010-2019, domestic savings averaged 11.5 per cent of GDP. This is a significant fall in domestic savings compared to the savings rate of 20.20 percent recorded in the period 1970 – 1979 (World Bank Data, 2020). This is also contrary to the Government's envisaged savings rate of 30 percent of GDP as per Vision 2030. Some policy makers and economic scholars have thus raised concerns about the country's falling savings rate. The argument is that the low and declining rate of saving has forced the Government to run large current account deficits to maintain reasonable levels of investment. The excessive reliance on foreign saving has exposed the economy to volatile international capital flows.

Despite these concerns, the impact of growth on savings and / or the impact of savings on Kenya's economic growth is not fully understood. This is because most of the studies on the causal relationship between savings and economic growth have been done mainly in Europe, Latin America, and Asia. Few of the studies have been conducted on the Sub-Saharan African region. Even where such studies have been done, the empirical findings on the relationship between savings and economic growth have largely been inconclusive. This study therefore seeks to contribute to the ongoing discourse on savings and economic growth by examining the relationship between

savings and economic growth in Kenya, a developing country.

An examination of the direction of causality between the savings rate and GDP growth rate is of considerable importance for development policy. For example, if savings drive growth through an automatic translation of savings into capital formation, then the main goal of development policy should be to increase savings, while if growth results less from savings and capital formation and more from other factors such as policies relating to technological innovation, human capital, international trade or foreign direct investment, then they should be the main targets of development policy (Agrawal & Sahoo, 2009). In order to get a firm conclusion, this study analyzes the direction of causality between savings rates and growth rate. We also include the impact of other explanatory variables like dependency ratio, foreign savings and interest rates.

The remaining part of the paper is organized as follows: Section 2 briefly presents a review of the literature on savings and economic growth. Section 3 presents trends in growth and savings in Kenya, section 4 dwells on research methodology while section 5 presents the results and a discussion of the findings. Section 6 concludes the study and provides policy recommendations.

2. Review of Literature

Sajid & Sarfraz (2008) investigated the causal relationship between savings and output in Pakistan by using quarterly data covering the period 1973 to 2003. The study concluded that savings precede the level of output in the case of Pakistan. Odhiambo (2008) examined the dynamic causal relationship between financial depth, savings and economic growth in Kenya. The results reveal that economic growth Granger causes savings, while savings drive the development of the financial sector in Kenya.

Sinha (1996) studied the relationship between GDP and saving in India. He found that both gross domestic saving and gross domestic private saving are cointegrated with GDP. However, causality tests between the growth of gross domestic saving/the growth of private domestic saving and the growth of GDP indicate that the causality does not run in any direction. Mohan (2006) studied the causal relationship between savings and economic growth in countries with different income levels. The results could not fully determine the direction of causality for low-income countries. In all of the low-middle income (LMC) countries, the causality is from economic growth rate to growth rate of savings. In all of the high-income (HIC) countries, except Singapore, the causality is from economic growth rate to growth rate of savings. However, bi-directional causality is more prevalent in upper-middle income (UMC) countries. The study concluded that economic growth rate causes growth rate of savings.

Sinha and Sinha (1998) studied the relationship among private saving, public saving and economic growth in Mexico. The results indicate that private saving and GDP have a long run relationship. The multivariate causality

tests indicate that there is evidence that the growth of GDP Granger causes the growth of private and public savings. The study did not find any evidence of reverse causality. Jappelli and Pagano (1997) studied the determinants of saving focusing on the Italian experience. The findings indicate a very strong contemporaneous correlation between national saving and growth. The data also reveal that in the Italian historical experience growth tends to lead saving, rather than the opposite.

Gavin et al. (1997) examined saving behavior in Latin America. The findings indicate that higher growth precedes higher saving, rather than the reverse. It is only after a sustained period of high growth that saving rates increase and may do so with a delay that can be quite significant. The most powerful determinant of saving over the long run is economic growth. He recommends that the emphasis of policy should be shifted away from saving and concentrated on removing the impediments to growth.

Carroll & Weil (1994) examined the relationship between income growth and saving using both cross-country and household data. The findings indicate that growth Granger causes saving, but that saving does not Granger cause growth. The study also finds that households with predictably higher income growth save more than households with predictably low growth. On the other hand, Jangili (2011) investigated the relationship between saving, investment and economic growth for India over the period 1950 to 2007. The results of Granger causality test show that higher saving and investment lead to higher economic growth, but the reciprocal causality is not observed. Further, the study observed that saving and investment led growth comes from the household sector.

Sothan (2014) tested the direction of causality between domestic saving and economic growth in Cambodia, using data for the period 1989–2012. The study found that domestic saving does not Granger cause economic growth, and also economic growth does not Granger cause saving. The study concluded that domestic saving and economic growth are independent of each other in Cambodia. On the other hand, Mavrotas and Kelly (2001) tested the causality between savings and growth in India and Sri Lanka. The study did not find causality between GDP growth and private savings in India, and bidirectional causality between private savings and growth in Sri Lanka.

Agrawal and Sahoo (2009) found that the total savings rate is determined by the GDP growth rate, dependency ratio, interest rates and bank density. Savings rate is also affected by the public savings rate. Further, using the Granger Causality they find that in Bangladesh, there is a bi-directional causality between savings and growth. While trying to examine the determinants of private and public savings in 36 Latin American countries, Edwards (1996) finds that per capita income is the most important determinant of private savings along with the demographic structure, social security expenditure and the depth of the financial sector. The strong positive relationship between savings and income have been found by Lahiri (1989) and Dayal-Gulati & Thimann (1997).

Real growth and foreign savings influence both private savings and public savings. The panel study by Loayza, Schmidt-Hebbel, and Servén (2000) finds that income, inflation and fiscal policy have a positive impact on the savings rate but the dependency ratio and financial liberalization have negative impact on private savings.

Trends in Savings and Economic Growth in Kenya

Kenya's long-term blue print, popularly referred to as Vision 2030 recognizes savings as key to Kenya's economic growth. The Vision targets to achieve a savings rate of 30% of GDP by year 2030 in order to domestically fund the bulk of Kenya's investment needs, and achieve an economic growth of 10% annually. However, Kenya's present savings rate of 11.76% is relatively low. This is true given that the country's savings rate was higher than Singapore's savings rate in the 1960s, a country which currently has one of the highest savings rates in the world. Kenya's savings rate started declining in the 1980s, a trend which has persisted since then (Figure 1). For example, the gross domestic savings fell from about 19.3% of GDP during the period 1980–1989 to 11.5% during the period 2010-2019.
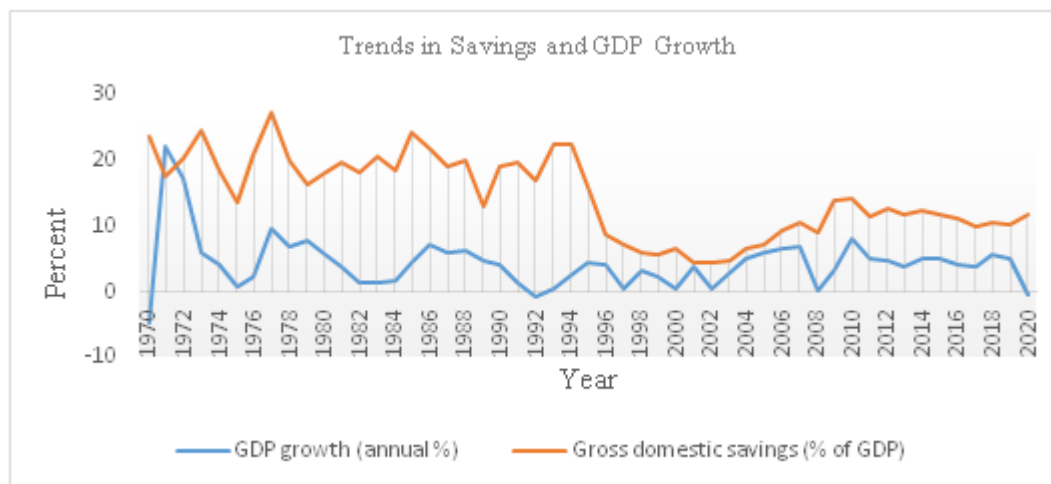

Figure 1: Savings and GDP Growth in Kenya

3. Methodology

Regarding the relation between savings and growth, most growth theories imply that higher savings rates lead to faster capital accumulation and faster growth. The theoretical underpinnings of the relationship between savings and growth can be traced to the early growth models of Harrod (1939) and Domar (1946) which assumed that output Y was proportional to the capital, $Y = AK$ where A is a constant and imply that growth rate of output would be proportional to the investment and savings rate. Formally,

$$dY/dt = AdK/dt = AsY$$

where $s = (dK/dt)/Y$ is the investment rate assumed to equal savings rate, So that,

$$Growth = (dK/dt)/Y = As$$

Since labour requirement is not a binding factor in the context of developing countries, which often have unlimited supplies of labour, growth would be proportional to the savings rate. Therefore, Lewis (1954) and Rostow (1960) emphasized that a higher rate of savings would lead to higher economic growth. The endogenous growth models (Lucas, 1988; Romer, 1986), which return to the Horrod-Domar assumptions of constant returns to capital again come to the conclusion that higher savings and investment rates lead to a higher growth rate of output. Thus, growth theories imply that higher savings rates should lead to higher growth rates, at least if the economy is below the steady state rate of output.

Consumption theories for example, the permanent income hypothesis and life cycle hypothesis presume that growth of income (current as well as expected) determines the level of consumption and in turn influences the level of savings. Supporting this view, Modigliani (1986) and Franco (1970) argue that income growth makes the young richer than the old. Thus, under the life-cycle hypothesis, the young will be saving more than the dis-savings of the old, so that a positive association between savings and growth can be expected. Extending the Modigliani model of the life cycle hypothesis to the macro level, the major determinants of the savings rate are the rate of growth of per capita income and the age structure of the population. However, the impact of growth on savings could be negative if the consumption habits change rapidly upward with growing income. If the consumption habits change slowly in response to growing income, a larger fraction of increased income may be saved resulting in higher savings with higher income (Carroll & Weil, 1994). Thus, consumption theories suggest that it is growth that determines the savings rate although the direction of the impact of growth on savings rate is debatable.

We follow the approach of Agrawal and Sahoo (2009). The savings rate is measured as the ratio of Gross Domestic Savings (SAV) to nominal Gross Domestic Product. As already discussed above, growth is one of the important factors affecting the savings rate according to the growth and consumption theories. Demographics

(ADEP) also affect aggregate savings, measured by the age distribution of the population or the share of inactive or dependent population. We use the age dependency ratio (ADEP), the share of dependent age population (aged below 15 or over 64 years) to the working age population (aged 15 to 64 years), as a reasonable proxy to capture this effect. The expected sign of the coefficient of DEPEND is negative. Foreign Savings as Share of GDP (FS) may encourage more consumption, and reduce savings. That is, foreign and national savings are likely to be substitutes. The variable FS used in the relation to be estimated is the negative of the current account balance as a proportion of the GDP. The expected sign of its co-efficient is negative. Analytically, an increase in interest rates (DEPR) will have an ambiguous effect on savings because of a positive substitution effect towards future consumption and a negative income effect due to increased real returns on saved wealth. An increase in the inflation rate (INFL) can impact income or wealth negatively, which can lower savings. It can also lower the real interest rate which can have an ambiguous effect on the savings rate. Further, an increase in variability of inflation rate (which usually accompanies a higher level of inflation) is often treated as a proxy for macroeconomic uncertainty. The increased macro uncertainly due to increase in inflation rate may induce people to save more for precautionary motives. Therefore, analytically, the overall impact of an increase in inflation on the savings rate is ambiguous.

The relation between the total domestic savings rate, growth and other relevant variables is proposed to be as follows:

$$SAV = \alpha_0 + \alpha_1 GDPG + \alpha_2 DEPR + \alpha_3 ADEP + \alpha_{1_4} FS + \alpha_5 INFL$$

Additionally, we analyze the direction of causality between savings and GDP growth rate using Granger Causality test.

Secondary data on savings and GDP growth was obtained from the World Bank over the period 1970 – 2020. The data collected was analyzed by using both descriptive and inferential statistical procedures.

4. Data Analysis and Discussion of Results

4.1 Does Higher Savings Lead to Higher Growth?

The variable series cover the period from 1970 to 2020.

Table 1 indicates a positive correlation of 0.15 between savings and GDP growth.

Table 1: Correlations

	SAV	GDPG
SAV	1.00	0.15
GDPG	0.15	1.00

With application of 5 lags, the Granger causality results indicate that the direction of causality is from economic growth to savings rate, rather than savings to growth (Table 2). The implication of this is that higher savings does not necessarily lead to higher growth.

Table 2: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
GDPG does not Granger Cause SAV	46	3.93445	0.0062
SAV does not Granger Cause GDPG		0.46030	0.8030

4.2 ARDL Results of Savings Equation

The starting point is confirmation of the unit roots of the variables. This is given in Table 3, in which we show a mix of variables integrated of orders 1 (I (1)), 2 (I (2)) and 3 (I (3)). The age dependency (ADEP) variable is I (2), hence the need to difference it twice prior to estimation of the model. Thus the ARDL approach is considered the most suitable for estimation of the savings equation.

Table 3: Unit Root Test

Variable	Augmented Dickey-Fuller Test (t-value [prob.])	
GDPG	-5.63 (0.00)	Stationary
SAV	-2.39 (0.15)	Nonstationary
DEPR	-1.94 (0.31)	Nonstationary
ADEP	-0.14 (0.94)	Nonstationary
FS	-3.71 (0.01)	Stationary
INFL	-4.00 (0.00)	Stationary
First Difference		
SAV	-7.77 (0.00)	Stationary
DEPR	-7.14 (0.00)	Stationary
ADEP	-1.78 (0.39)	Nonstationary
Second Difference		
ADEP	-6.34 (0.00)	Stationary

The estimated autoregressive distributed lag (ARDL) model is ARDL (3, 5, 2), covering the period 1970-2020 (restricted constant and no trend). The bounds test as shown in Table 5 supports the existence of a long run relationship between savings and its determinants. Furthermore, the estimated long run model (given in Table 4) indicates that GDP growth has significant effect on savings. Moreover, foreign savings has a negative effect on domestic savings as expected, though not highly significant.

Table 4: Long-run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPG	5.238058	2.411934	2.171725	0.0376
FS	-2.362466	1.198099	-1.971845	0.0576
C	5.024940	8.230880	0.610498	0.5460
SAV = 5.2381*GDPG-2.3625*FS + 5.0249				

Table 5: F-Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
			Asymptotic: n=1000	
F-statistic	6.037996	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	44		Finite Sample: n=45	
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725
			Finite Sample: n=40	
		10%	2.835	3.585
		5%	3.435	4.26
		1%	4.77	5.855

4.3 The Short-run Model

As given in Table 6, the short-run model shows that lagged GDP growth has significant effects on savings. The other variable (foreign savings) has insignificant impact in the short run. The model satisfies all the diagnostic tests: Normality of the residuals is satisfied with Jaque-Bera statistic of 0.85 [Prob=0.65]. Serial correlation is ruled out in the residual series given that the Breusch-Godfrey Serial Correlation LM test returns an F-statistic of 0.56 [Prob. =0.58]. The residual series is confirmed to be homoskedastic given a Breusch-Pagan-Godfrey heteroscedasticity test F-value of 0.56 [Prob. =0.85]. The model stability is confirmed by a Ramsey Reset test of 1.82 [prob. =0.08] and also indicated by the test results of CUSUM and CUSUM of Squares (Figures 2 and 3 given below).

Table 6: Error Correction Model (ECM) Regression

| Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (SAV (-1))	-0.428858	0.139108	-3.082901	0.0043
D (SAV (-2))	-0.352987	0.130414	-2.706677	0.0110
D (GDPG)	0.223084	0.162939	1.369125	0.1808
D (GDPG (-1))	-0.951511	0.198423	-4.795353	0.0000
D (GDPG (-2))	-0.942785	0.211297	-4.461889	0.0001
D (GDPG (-3))	-0.813263	0.197998	-4.107424	0.0003
D (GDPG (-4))	-0.355591	0.151022	-2.354556	0.0251
D (FS)	-0.115284	0.088874	-1.297165	0.2041
D (FS (-1))	0.161017	0.094596	1.702153	0.0987
CointEq (-1) *	-0.171478	0.033318	-5.146773	0.0000
R-squared	0.627087	Mean dependent var		-0.208612
Adjusted R-squared	0.528375	S. D. dependent var		3.220820
S. E. of regression	2.211897	Akaike info criterion		4.622295
Sum squared resid	166.3447	Schwarz criterion		5.027793
Log likelihood	-91.69049	Hannan-Quinn criter.		4.772673
Durbin-Watson stat	2.127019			
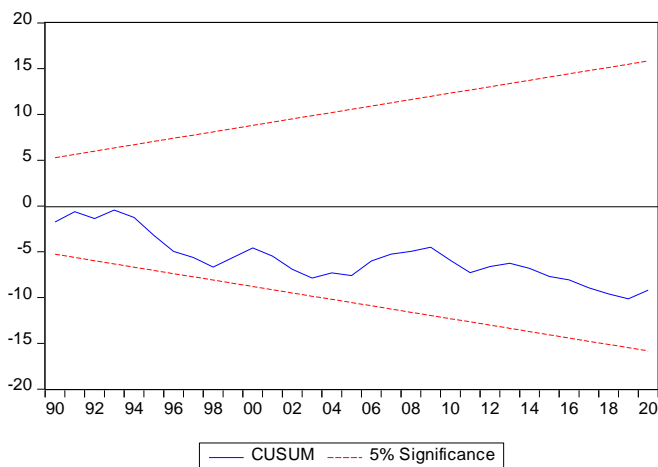
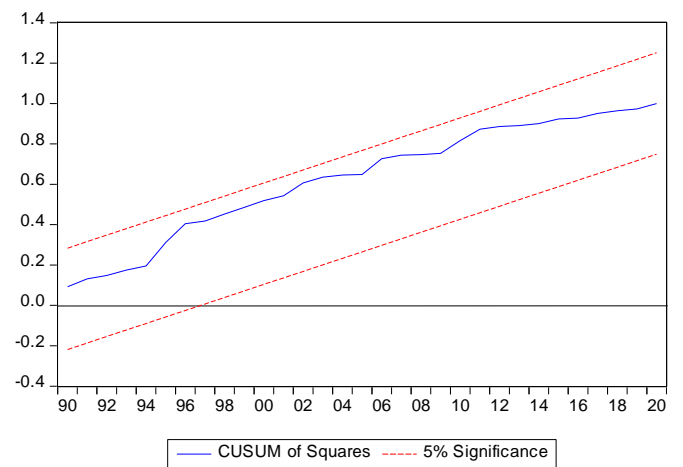**Figure 2:** Recursive Estimates (CUSUM Test)

Figure 3: Recursive Estimates (CUSUM of Squares Test)

5. Conclusion

This study set out to establish the determinants of savings in Kenya and the causal relationship between savings and growth, whether higher growth leads to higher savings in the long run. The results derived from the study indicate that the positive relationship between savings and growth can be attributed to a causal relationship whose direction is from growth to savings, rather than from savings to growth. Therefore, growth has significant impact on savings and indeed higher growth will lead to increased savings in the long-run.

The findings of this study are in support of studies have cast doubt on the savings-driven economic growth models and argued that economic growth promotes savings and not vice versa (Carroll & Weil, 1994; Mohan, 2006; Odhiambo, 2008; Sinha & Sinha, 1998). It is therefore recommended that policy makers in Kenya prioritize economic growth policies in order to enhance Kenya's savings rate.

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