INFLATION-INDUCED SAVINGS IN KENYA

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Abstract

Recently most nations have been experiencing reduced gross savings due to external shocks, among them the financial crisis and coronavirus disease-related macroeconomic costs, this study investigates the role of the inflation rate in explaining the variation in the saving behaviour in Kenya. Available empirical works have been conducted mostly in advanced economies and hence are difficult to generalize for developing countries considering differences in macro economic conditions. Therefore, this study will investigate the effect of inflation on savings variations in Kenya. This study adopted a quantitative research design to analyse the effect and trend of the inflation rate on saving behaviour in Kenya. This was applied for the period 1975-2020 using secondary data and the ordinary least squares (OLS) estimation technique. From the regression findings, inflation rate, income growth and interest rate positively influence savings behaviour in Kenya. In contrast, the high consumption rate harms national savings in Kenya. From regression results, high inflation is critical for stimulating national savings in Kenya. This finding is puzzling as it contradicts the implications of most monetary general equilibrium theories. Expansionary inflation findings imply that the Central Bank of Kenya should bolster inflation programmes and policies to accelerate national saving growth.

Keywords: Inflation, Savings, General Equilibrium Theory

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Introduction

Worldwide, persistent general price increase remains one of the macroeconomic variables that are of concern to the economist. In particular, the effect of inflation on savings stands out as a concept that appeals to the attention of not only the public sector and households but all stakeholders in any developing country. The stimulation resulting from a high inflation rate may result to impacting on real wealth by depressing the real value of financial assets in an economy (Wachtel, 1977; Thomi & Mose, 2022). On the other hand, the wealth effect would slow consumption and therefore augment national savings through economy saving involuntary. This would result from a switch from demanding financial assets to real assets driven by consumers' response to unanticipated inflation (Deaton, 1977) if real income is accurately indexed. To a greater extent, most empirical works on the inflation and savings relationship, generally observed that households and governments respond to the rising price level of goods and services by cutting back on consumption and borrowing, thereby increasing their aggregate gross savings (Wachtel, 1977). Thus, if the positive relationship between inflation and saving no longer holds with the financial crisis and coronavirus effects, a rising rate of the general price level in the future will not guarantee a higher average rate of household or government saving. This development could hurt the economic growth progression of an individual nation since reduced national savings tend to slow government obligation to supply public goods through expenditure and investment. However, the traditional economic theory indicates that inflation has no significant impact on average saving, except under certain macroeconomic conditions, to generate readjustments in some components of household wealth (Deaton, 1977). The empirical evidence on the effects of inflation on gross savings in developing countries is still mixed and inconclusive (Heer & Suessmuth, 2006; Celik & Kayali, 2009; Osundinak & Osundina, 2014).

Inflation and Savings Relationship in Kenya

Gross savings which result from the amalgamation of private and public savings of a nation is vital to economic growth. From a global view, savings rates vary from one region to the other, for example at least 40% of East Asia's gross disposable income is saved as compared to 20% of Sub-Saharan Africa. The slowdown in savings was attributed to cyclical factors that included low incomes, high dependency ratios, and high inflation (World Bank, 2015). This implies that inflation has to be kept in check to avoid it becoming detrimental to savings.

In the period of 1980s, Kenya's savings was greater than most of its peer neighbouring states. Currently, this is not the case over the past decade; Uganda, Tanzania, Senegal, and Ghana have overtaken Kenya in terms of savings (World Bank, 2015). The inflation rates that have been perceived to affect the saving growth rate have been attributed to several factors with the least growth of - 0.80% in 1992 (World Bank, 2013) followed by the highest inflation rate in 1993 at 45.98%. Figure one presents the national savings trend in Kenya for the period 1980 to 2014.
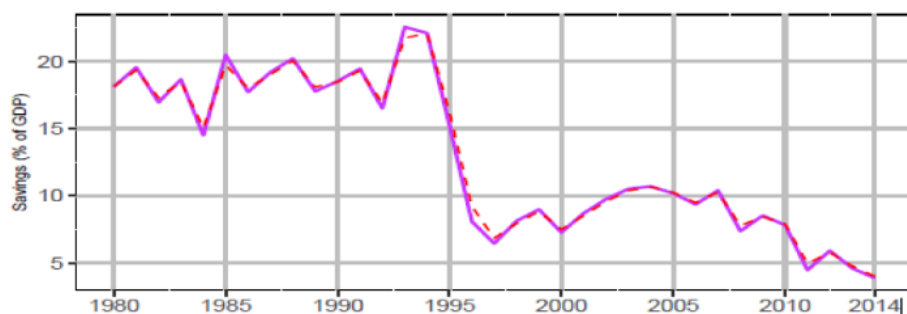
Figure 1: Kenya's National Savings Trend.

Source: World Bank (2015).

The straightforward dissimilarity between willingness to save and determinants of the ability to save is that capacity relies on two main factors, which are the level of per capita income and growth of income. On the other hand, willingness to save is dependent on financial variables like inflation, financial deepening levels, and interest rates (World Bank, 2015). Specifically, arguments have been put forward concerning inflation that it applies a mild positive effect which within a short instance turns negative and thus puzzling (Deaton & Paxson, 1993).

There is no doubt that savings mobilization is core in monetary and fiscal policy as a development process. In their empirical work, Cheruiyot et al. (2012) termed it the surest way of increasing income and boosting productivity in an attempt to eradicate poverty in developing nations. This infers that unless there exists a corresponding rise in income levels the accumulated savings will end up being depleted (Labonte, 2011; Cheruiyot et al., 2012). Hence, the concern by both stakeholders and policymakers on the unpredictable relationship between inflation and savings culture around the globe.

Over time, a great deal has been put into studying the drivers of inflation rather than the effects of inflation, especially on national savings. This is contrary to the ideal case which puts savings as a key precondition for developing countries to sustain economic growth (Heer & Suessmuth, 2006). Since savings and inflation are interrelated variables, it is paramount to understand their complex relationship. This informs the need for this study to answer the following question: Does inflation exert a positive influence on savings?

Objective

This study aims at examining the effect of inflation on savings in an open economy in Kenya for the period 1975 to 2020.

Review of Literature

Theoretical Literature

The interrelationship between inflation and savings is highly dependent on households' reactions to changes in the inflation rate (Chopra, 1988). Should households alter their savings pattern by redirecting their savings to consumer durables and physical assets from finances then savings will decline. Conversely, individuals who are after sustaining real value, in an inflationary case, would increase their savings. In the life cycle theory of savings, the lack of an established institutional structure and the existence of inflation would result in higher savings in the system (Chopra, 1988). According to Heer and Suessmuth (2006), a greater number of models that look into the effect of inflation on savings establish a negative effect. The explanation behind this is that unanticipated inflation causes the real income to decline and therefore the savings rate also reduces. Miller and Benjamin (2008) also gave a possible explanation that in high inflation there is an increased opportunity cost of holding

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money and increased rewards for the search activities in shopping wasting real resources and thereby reducing savings. However, Deaton and Paxson (1993) give a converse explanation of this relationship.

Deaton's hypothesis portrays the existence of a positive relationship between savings and inflation rate (Deaton, 1977). It proposes that the savings rate can increase during unanticipated inflation if real income is accurately anticipated or indexed (Deaton, 1977; Deaton & Paxson, 1993). Therefore, in a macro economy, the higher the uncertainty the larger the portion of the money saved for precautionary motives. This indicates that should inflation rates increase then the savings rates should as well increase. The uncertain impact that results from inflation leads to a rise in savings, as captured by empirical hypotheses and theories. The hypotheses treat inflation as a proxy for attitudes about economic conditions, particularly uncertainty (Wachtel, 1977). Should the different groups within a household portray different propensities to consume and are subject to dissimilar taxation rates, then redistribution will affect the aggregate savings of these respective households (Howard, 1978). To a greater extent, inflation also interferes with other macroeconomic factors that determine savings behaviour (Miller & Benjamin, 2008).

Empirical Gap and Future Research

The empirical literature in both developed and developing countries have proven the existence of inconclusive outcome concerning the effect of inflation on saving. Some of the research findings on the relationship between inflation and savings include; the insignificant effect of inflation on saving (Den Haan, 1990; Chari et al., 1996; Celik & Kayali, 2009), and some findings portraying a negative effect (Gylfason & Herbertsson, 2001; Ahimad & Muhamood, 2013; Osundinak & Osundina, 2014) while some studies stating positive effect (Dholakia, 1995; Mallik & Chowdhury, 2001; Thomi & Mose, 2022). Therefore, this study will focus on reviewing the relationship between savings and inflation in Kenya. The driving motivation is to derive findings and policy recommendations that can be applied in the context of Kenya.

Conceptual Framework

The study postulates that inflation and other determinants of savings influence the saving culture in Kenya. In between the dependent and explanatory variables are the intervening variables that are not controlled for in the study. This relationship is conceptualized in Figure Two.
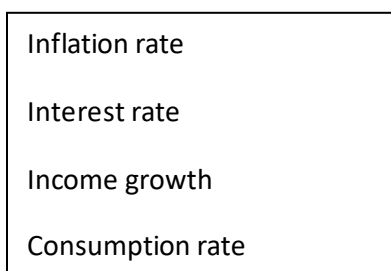
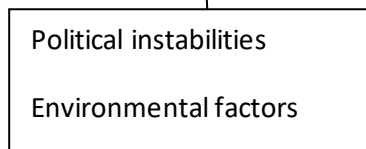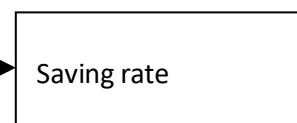**Independent Variables**   **Dependent Variable**

Figure 2: Conceptual Framework Analysis.

Research Methodology

Research Design

The study applied a quantitative research design to investigate the effect of the inflation rate on the saving rate in Kenya. The quantitative research design involves collecting and analyzing numerical time series data. Research analysis was applied for the period 1975-2020 using time series secondary data and the ordinary least squares (OLS) estimation technique. The research was carried out in Kenya. Kenya is located in the sub-Saharan African region. Kenya's latitude and longitude are 0.0236° S and 37.9062° E respectively (Gisore, 2021). Kenya's governance system consists of national government and county governments. Kenya's national savings have been affected by the financial crisis and several external shocks. The slowdown in savings was attributed to cyclical factors that included low incomes, high dependency ratios, and high inflation (Cheruiyot et al., 2012; World Bank, 2015). This development could hurt the economic growth progression of Kenya since reduced national savings tend to slow government obligation to supply public goods through expenditure and investment.

Data Collection Methods

This study applied the time series yearly data for 46 years taken from the period 1975 to 2020 for Kenya. The secondary data had been collected from different sources such as World Bank national accounts data, the International Monetary Fund database and Statistical Abstracts using a data collection schedule. The description of the study variables is given in Table One.

Table 1: Description of Variables

Variables	Description	Unit of Measurement	Source
s	Saving rate	Gross savings (% GDP)	World Bank national accounts data
i	Inflation rate	Consumer prices (%)	International Monetary Fund database
y	Income growth	Real GDP growth rate (%)	Statistical Abstracts
r	Interest rate	Real interest rate (%)	International Monetary Fund database
c	Consumption rate	Final consumption expenditure	World Bank national accounts data

Notes: i– Inflation rate, r– interest rate, y– income growth, c–consumption rate, and s–saving rate

Regression Model and Interpretation

Building on Gisore (2021), a simple econometric saving growth function during which savings is an explanatory variable was formulated and presented as follows:

$$s_t = \beta_0 + \beta_1 i_t + \beta_2 y_t + \beta_3 r_t + \beta_4 c_t + \varepsilon_t$$

ε_t - Error term, β_0, β_1, β_2, β_3, and β_4 are slope coefficients.

Where,

$s_{i,t}$ - Gross savings (as a percentage of GDP) as a proxy of savings;

$i_{i,t}$ - Consumer prices (annual %) as a proxy of the inflation rate. Inflation can stimulate or impede the level of gross savings in a country;

$y_{i,t}$ - Real GDP growth as a proxy of income growth. The study expects a positive relationship between income growth and savings. According to the permanent income theorem, higher income growth translates to higher future savings growth (Friedman, 1957);

$c_{i,t}$ - Final consumption expenditure as a proxy of consumption rate. Consumption increase is expected to slow savings growth as captured in the theory of consumer behaviour. If the expenditure budget increases, agents would increase their consumption, hence, decrease savings (Modigliani & Brumberg, 1954; Loayza et al., 2000)

$r_{i,t}$ - Real interest rate as a proxy of interest rate. The study expects a positive relationship, as the interest rate increases savings will accumulate. This can be attributed to the expected returns, in other words, the higher the interest rate, the higher the expected level of savings and returns.

ε_t - Error term, $\beta_0, \beta_1, \beta_2, \beta_3,$ and β_4 are slope coefficients.

Data Analysis Technique

The study used the ordinary least squares (OLS) estimation technique to analyze the relationship between the study variables. The study adopted Phillips–Peron unit root test which is positively built on the Dickey-Fuller test estimation approach. The test is robust concerning unspecified autocorrelation and heteroscedasticity in the disturbance process of the test equation (Ahmad & Mahmood, 2013; Emara & Kasa, 2021; Gisore, 2021). Unit root test is important to make sure all variables are stationary to avoid misleading and inconclusive results. In addition, diagnostic examinations were applied to assess the validity of the model regression analysis and to reduce endogeneity issues in the study (Emara & Kasa, 2021). The study conducted diagnostic tests such as heteroscedasticity (Breusch-Pagan test) and autocorrelation (Breusch–Godfrey LM test) regression estimations.

Findings and Discussion

Descriptive Statistics Results

Table two presents the descriptive statistics of both the dependent and independent variables for the period 1975-2020.

Table 2: Descriptive Matrix

Variable	Observations	Mean	Standard Deviation	Min	Max
i	46	11.91027	8.136223	1.554328	45.97888
r	46	6.272396	7.127078	-10.096	21.09633
c	46	2.34e+10	2.58e+10	2.75e+09	9.03e+10
y	46	3.854185	2.428679	-.799494	9.453798
s	46	15.71004	6.583931	5.014243	37.15646

Notes: *i– Inflation rate, r– interest rate, y– income growth,   c–consumption rate, and s–saving rate*

The average value of the interest rate is 11.9 units. The interest rate on average increased from the value of 1.55 and reached the maximum value of 45.98 per cent in Kenya. The value for the standard deviation for the inflation rate in Kenya stood at 8.136223, implying deviation from the mean was minimal during the period. The saving rate average is 15.7, the savings increased from the value of 5.01 and go to the maximum level at the point of 37.15. The standard deviation in Kenya of savings was 6.583931 showing that savings did not deviate too much from the mean. The descriptive estimation result showed that in Kenya the income growth stood on average at 3.9 per cent. The income is increased from -0.799494 per cent and goes to the maximum level of 9.453798 per cent. The Consumption rate average value is 2.34e+10. The value increased from 2.75e+9 and go to the maximum level at the point of 9.03e+10 per cent. Bivariate correlation was applied to determine the degree of variable relationship as captured in Table three.

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Table 3: Correlation Matrix Results

Variables	*s*	*i*	*c*	*r*	*y*
s	1	0.567	-0.475	-0.046	-0.077
i	0.567	1	-0.368	-0.286	-0.365
c	-0.475	-0.046	1	0.070	0.069
r	-0.046	-0.046	0.070	1	-0.121
y	-0.077	-0.046	0.069	-0.121	1

Notes: i– Inflation rate, r– interest rate, y– income growth, c–consumption rate, and s–saving rate

The absolute value of the coefficient of correlation ranges from 0 to 1. In general, most independent variables seem to be negatively correlated between themselves. The saving function has a negative relationship with consumption rate, income growth and interest rate. However, the saving function was positively related to the inflation rate against theoretical expectations (Mallik & Chowdhury, 2001).

Analysis Results

Phillips-Peron unit root test was conducted to find out whether the variables were stationary at the level or whether they were non-stationary at the level and the result is reported in Table four. The unit root analysis is significant to eliminate any possibility of spurious regressions and erroneous conclusions (Nyoni & Naftaly, 2023).

Table 4: Phillips-Peron Unit Root Analysis Result

Variables	Phillips-Peron at Level		Order	Phillips-Peron at First difference		Order
	t value	P-value		t value	P-value	
r	-4.449572***	0.0009	I(0)	_	_	_
y	-4.068307**	0.0026	I(0)	_	_	_
i	-3.798189***	0.0056	I(0)	_	_	_
c	5.247197	1.0000	I(1)	-5.980668***	0.0000	I(0)
s	-2.801566	0.0661	I(1)	-9.256772***	0.0000	I(0)

*Notes: i– Inflation rate, r– interest rate, y– income growth,   c–consumption rate, and s–saving rate. *** one percent level of significance, **five percent level of significance*

From Table four findings, interest rate, income growth, and inflation rate were found to be stationary at the level while the remaining variables, that is savings and consumption rate were determined to be stationary after first differencing that is integrated of order one. Table five reports the results of the OLS regression analysis.

Table 5: Analysis Results

Variable	Coefficient	Std. Error	t-ratio	Prob.
i	0.750565	0.073345	10. 23330	0.0000***
r	0.333182	0.108230	3.078453	0.0037***
y	1.234034	0.267585	4.611752	0.0000***
c	−7.36875e-011	3.22453e-011	−2.285	0.0275**
$cons$	9.27266	3.05194	3.038	0.0041***
The goodness of Fit Test	Adjusted R-squared		= 0.439227	
F-Statics	$F_{(4,41)}$ = 8.028357		Prob> F = 0.000071	
Breusch-Godfrey LM Test	$F_{(1,41)}$ = 18.37513		Prob> F = 0.0001	
Breusch-Pagan Test	$F_{(4,41)}$ = 1.361759		Prob> F = 0.2639	

Notes: i– Inflation rate, r– interest rate, y– income growth, c–consumption rate, and s–saving rate.
*** *one percent level of significance,* ** *five percent level of significance*

The findings reveal that the inflation rate is positively significant in Kenya to the savings rate at a five per cent level of significance. This suggests one per cent increase in the inflation rate will translate to about a 0.8 per cent increase in the saving rate. Therefore, as inflation increases people maintain their assets and wealth and thus savings increase (Labonte, 2011; Dash & Kumar, 2018). As captured in the life cycle theory of savings, the lack of an established institutional structure and the existence of inflation would result in higher savings in the economic system (Chopra, 1988; Deaton & Paxson, 1993). In general, there is a positive relationship between the two but in past empirical studies, there exists a negative affiliation. The results agree with Chaturvedi et al. (2008) study in Asia; they found a positive relationship between saving and inflation. The findings support Deaton's hypothesis that unanticipated inflation may lead to involuntary savings in Kenya (Deaton, 1977; Deaton & Paxson, 1993). Deaton and Paxson (1993) argue that the savings rate can increase during unanticipated inflation if real income is accurately anticipated or indexed. Therefore, in a macroeconomy, the higher the uncertainty the larger the portion of the money saved for precautionary motives. The finding contradicts a similar study by Emara and Kasa (2021), who reported a negative relationship between inflation and savings in India. The study concluded that inflation is harmful to savings as captured by Den Haan's (1990) shopping-time model. In addition, arguments have been put forward concerning inflation that it applies a mild positive effect which within a short instance turns negative and thus puzzling (Osundinak & Osundina, 2014).

From the regression analysis, the interest rate has a positive effect on the saving rate in Kenya. This implies a one per cent rise in interest rate will stimulate 0.3 increases in savings. The changes in the interest rate could have a substitution effect on saving; for example, the lower the interest rate, the higher the level of consumption and investment leading to a lower level of saving (Nabar, 2011). Most empirical works argue that increasing the interest rate will stimulate savings while discouraging consumption and new investment (Masson et al., 1997; Thomi & Mose, 2022), furthermore in some cases, a low-interest rate may also prompt the population to increase their savings to compensate for expected lower returns (Loayza et al., 2000).

Income growth is positively significant to the saving rate in Kenya. This suggests one per cent increase in income will translate to about a 1.2 per cent increase in national savings. The high-income growth will translate to a high saving rate if employees have a high saving tendency (Rasmidatta, 2011). This infers that unless there exists a corresponding rise in income levels the accumulated savings will end up being depleted (Labonte, 2011; Cheruiyot et al., 2012). As captured in the permanent income hypothesis (Modigliani & Brumberg, 1954; Friedman, 1957; Rasmidatta, 2011), higher income growth, which may represent higher future growth, should translate to higher savings in the economy.

Consumption expenditure was negative when regressed in the saving growth function. This suggests one per cent increase in final consumption will translate to about a 0.01 per cent decrease in national savings. This means that higher consumption leads to fewer savings, which could also result in poor capital accumulation and growth (Modigliani & Brumberg, 1954; Rasmidatta, 2011). According to the life-cycle hypothesis households seek to smooth consumption throughout their lifetime by borrowing when their income is low and saving when their income is high (Modigliani & Brumberg, 1954; Loayza et al., 2000).

The F-test result indicates that all the independent variables have explanatory power at a 1 per cent level of significance. The coefficient of determination (adjusted R^2) shows that about 44 per cent of the dependent variable is explained within the model which implies it fits the regression function well. From the Breusch-Pagan test result, heteroscedasticity is not a problem. The Breusch-Godfrey LM test shows there is a serial correlation. This research employed robust standard error to correct the autocorrelation problem.

Conclusions and Recommendations

This study's estimation findings affirm that the inflation rate is a key enabler of savings growth in Kenya. This implies that an increase in the inflation rate results in the growth of savings in the Kenyan economy. Many studies demonstrate that inflation hurts national savings in an economy but in this study, the findings show inflation as an enabler of savings growth. The findings support Deaton's hypothesis that unanticipated inflation may lead to involuntary savings in Kenya. In addition, Income growth, interest rate, and consumption rate have mixed results and substantial influence on the saving rate in Kenya. Based on the findings the study recommends that the government and the stakeholders should adopt an expansionary monetary and fiscal policy that will help to speed up the inflation rate and thus stimulate the saving rate. The expansionary policy seeks to stimulate an economy by boosting demand through monetary and fiscal stimulus. The Central Bank of Kenya would use monetary and fiscal policy instruments such as increased expenditure and low-interest rates to achieve high inflation. However, inflation has to be kept in check to avoid it becoming detrimental to savings. Specifically, arguments have been put forward concerning inflation that it applies a mild positive effect which within a short instance turns negative. From the findings of this study, there's a necessity for further savings data disaggregation into household savings and government savings for deeper policy prescription.

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