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The Effect of Interest-Rate Changes on Household Saving and Consumption in Rwanda

Consolee Umuganwa[1], Dr. Patrick Mulyungi[2]

[1]Student, Jomo Kenyatta University of Agriculture and Technology

[2]Lecturer, Jomo Kenyatta University of Agriculture and Technology

Abstract: ***The effects of interest rate changes on consumption and saving are central concerns in macroeconomics and the economy at large. Rwanda generally has a good track record in recent years of maintaining a stable macroeconomic environment. However, recent developments in international financial and commodity markets have increased the risks to the macroeconomic stability, particularly to savings and investments. Due to increased inflation, interest rates have also gone up in order to pursue tightened monetary policies. However, there is a need to create an environment with moderate inflation accompanied with positive interest regimes to help mobilization of savings. This study aims at analyzing effects of interest rate changes on household consumption and saving in Rwanda. Using both primary data and secondary data, exploratory, descriptive and inferential analyses were conducted. The research targeted population of Rwanda and 400 individuals were sampled. Multistage sampling, convenience and judgement sampling techniques were used. Both univariate and multiple regression analyses were conducted to check household behavior and establish relationship between interest rate, consumption and saving. This study therefore results end up by revealing that there is a positive relationship between interest rate, household consumption and saving in Rwanda. Researcher recommends that government should put strong control on monetary policies to ensure interest rate remain in band whereby encouraging household to save and yet consume appropriately for better welfare.***

1. Background of the Study

The effects of interest rate changes on consumption and saving are central concerns in macroeconomics and the economy at large. Among many issues that are related to inter-temporal substitution, one of the most relevant from today's perspective is whether consumers can be induced to increase consumption and saving subject to changes in interest rate paid on deposits. There are crucial implications for understanding the timing and effectiveness of the interest rate as a policy instrument that affects consumption, savings and ultimately the growth rate of an economy. Understanding the response of household saving and consumption to changes in interest rates is central to many issues in economic policy. For instance, a reduction in the budget deficit would probably cause interest rates to decline. Alternatively, contractionary monetary policy generally causes interest rates to rise. If personal saving increases as a result, the corresponding fall in consumer spending slow the economy. Rwanda generally has a good track record in recent years of maintaining a stable macroeconomic environment. However, recent developments in international financial and commodity markets have increased the risks to the macroeconomic stability, particularly to savings, consumption and investments (MINECOFIN, 2018).

Under the Permanent Income Hypothesis, the elasticities of consumption and saving to interest rate depend on the model parameters such as the intertemporal elasticity of substitution. These elasticities have wide ranging implications for monetary policy, business cycles (Plosser and Rebelo, 1988), and tax incentives for saving. Most studies have found small effects of interest rates on consumption and saving (Hall, 1988). However, it remains unclear whether interest rate elasticities are truly small or these findings are spurious due to endogeneity of interest rate (Summers, 1982;Hall ,1988 and Balassa, 1989) or measurement problems like the difficulty of observing household specific interest rate (Browning and Lusardi, 1996; Mishkin, 1995).

The interest elasticity of consumption is defined as the percent change in consumption that results from a one-percent change in the interest rate. There is disagreement among economists about both the sign and magnitude of this elasticity, as existing theory and empirical evidence do not appear to offer any clear conclusions. Economists' standard model of consumer behaviour is the lifecycle model, which assumes that people determine their consumption and saving at each point in their lives by looking forward to their future income and desires, rather than considering only their current income and desired spending. Basic economic courses use a stylized version of this model to show that the interest elasticity of consumption can be decomposed into a "substitution" effect and an "income‖ effect, which work in opposite directions. Although this characterization of the lifecycle model appears in most casual writing on the topic, it is appropriate only for individuals in very specific situations (Elmendorf D.W., 1996).

In particular, this characterization is incomplete because it ignores the way in which interest rate changes induce revaluations of existing wealth that affect saving. This additional "wealth" effect contributes positively to the interest elasticity of saving, thus reinforcing the substitution effect, although it does not resolve the theoretical ambiguity about its sign. Alternative models of consumer behaviour lead to different analysis of the interest elasticity of consumption. While lifecycle consumers consider all of their lifetime resources in Campbell and Mankiw (1989), Carroll and Summers (1991), Poterba (1994), and Bernheim (1996) all emphasis the importance of considering a variety of models of saving behaviour. Choosing their current consumption and saving, one alternative model of behaviour posits that individuals have short planning horizons and use

a "rule of thumb" for choosing consumption and saving (Elmendorf, D.W., 1996).

Domestic savings are generally classified in three types, such as, voluntary savings, involuntary savings & forced savings. Voluntary saving relates to voluntary abstinence from consumption by private individuals out of personal disposable income and by companies out of profits. Involuntary savings is brought through involuntary reductions in consumptions. Forced Saving comes as a result of rising prices and the reduction in real consumption. Depending on time frame also, the savings can be categorised as short, medium and long-term savings. Savings can also be from foreign and domestic sources, from the private public sources and at the individual and institutional level (MINECOFIN, 2018). The growth of any economy depends on capital accumulation, which in turn depends on investment and an equivalent amount of savings to match it.

Two of the most important issues in development economics and for developing countries are how to stimulate investment and increase the level of saving to fund increased investment. Understanding the determinants of the aggregate savings rate is a crucial prerequisite in designing a number of policy interventions; from the design of the tax and social security system to the layout of financial markets regulations (MINECOFIN, 2018). It is therefore not surprising that the analysis of interest rate, consumption and saving behaviour has become one of the central issues in empirical macroeconomics.

2. Statement of the Problem

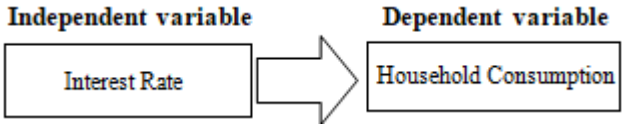
Over the past four decades, real interest rates have risen then fallen across the industrialized world. Over the same period, nominal investment rates fell, while house prices and household debt ratios rose (Gregory, 2015). Various Economists postulate that whenever there is an increase in interest rate, consumers tend to increase their savings thereby reducing their consumption to take advantage of the increase in interest rate on deposit. Some are of the view that, income exerts greater influence on consumption than even interest rate on deposit. Theories on consumption also confirm this assertion. Firstly, a conceptual breakthrough by Keynes in 1936 after which it was fairly obvious that a key relationship in macroeconomics analysis was the relationship between income and consumer expenditure; the ratio of consumer expenditure to income varies with the level of income both cyclically and across families at any given time. A different theory was suggested by Duesenberry in 1949.In his analysis, Duesenberry posited that, current consumption is not influence merely by present level of absolute and relative income but also by levels of consumption attain in previous period. Milton Friedman in 1957, in his work came out to postulate that consumption does not only depend on current income but also permanent income and series of papers written on consumption by Ando, Brunberg and Modigliani beginning in the early 1950s. These theories have their similarities and differences in their implications for stabilization policy.

According to MINECOFIN (2018), in Rwanda, due to increased inflation, interest rates have also gone up in order to pursue tightened monetary policies. However, there is a need to create an environment with moderate inflation accompanied with positive interest regimes to help mobilization of savings and consumption for attaining good standard living. The central question of this study is, what are effects of interest changes on household consumption and saving in Rwanda? By what magnitude does an interest rate change affect household consumption and saving in Rwanda if such effects exist? Though, there are a number of studies that were conducted at a global level on subject matter, most of the studies were made with reference to developed countries especially in Europe and USA. This means, they do not expound situation of developing countries Rwanda including. This study therefore seeks to answer the question, to what extent does interest rate changes affect household consumption and saving in Rwanda.

3. Objective of the study

To examine the effects of interest rate changes on household consumption in Rwanda.

4. Conceptual Framework



5. Research Design

This research is a mixed method and used a non-experimental design including case study, hypotheses and longitudinal research designs to reach objectives of the whole undertaking. According to (Kothari C.R., 2004) no single research design can sol1ely be sufficient for a whole research process, hence the combination of many designs.

Thus, this study follows a deductive research approach to confirm or disprove the logical assumption in the hypotheses and the study is both quantitative and qualitative nature.

6. Population of the Study

The target population under this study consists of households in Rwanda. As gender parity assumedly has the same implication in all parts of the world, the study seeks to make deductions tube applicable to the whole population so defined. The total population of this study is 2,952,325 households.

7. Sample Size and Sampling Techniques

The research was conducted within the Republic of Rwanda and both primary and secondary data were collected.

The sample size was calculated using Slovin Formula: $n = \frac{N}{1+N(e)^2}$; Where; n = the minimum sample size, N = the population from which the sample was obtained, e = the margin of error estimated at 5%.

According to National Institute Statistics of Rwanda (NISR)(2017) total households in According to Dépelteau, within the environment of cases, one uses the table of estimation of the size of a sample. Thus, while using the table of estimation of the size of a sample, a researcher who makes a research on a population of 100,000,000 individuals, should choose 384 individuals at random in order to have a sample of a level of confidence of 95% and precision of not less or more than 5%.This guarantee that sample size of 400 is sufficient.

Rwanda is 2,952,325 and by plugging in Slovin Formula we get 400 households. A total 400 respondents were sampled in the process. Nevertheless, our sample of 400 individuals remains in the limits of a representative sample, acceptable and even recommended.

8. Data Collection Instruments

To get useful data, primary data were collected by means of interviewing respondents with a pro-tested survey questionnaire loaded into KoBo collect form designed to hold responses from respondents. And secondary were collected through documentations.

9. Research Findings and Discussion

9.1 Effects of Interest Rate Changes on Household Consumption

Table 1, presents behavior of household consumption when interest rate rises

Table1: Consumption change when interest rises

	Frequency	Percent
Go up	228	51.25
Stay the same	70	18.25
Go down	102	30.5
Total	**400**	**100.0**

Source: Primary data, 2018

The majority (slightly more than 51 percent) confirmed than when interest rate rises their consumptions go up. Nearly 31 percent reported that when interest rate rises, their consumptions go down. However, slightly more than 18 percent reported that when interest rate rises their consumptions stay the same.

To check the magnitude effects of interest rate changes on household consumption, we run a regression analysis of interest on household consumption from data retrieved from Rwanda EICV4 and below are results:

9.2 Regression Analysis

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.396[a]	.157	.157	448445.39823

Source: NISR, EICV4
a. Predictors: (Constant), Interest
R–square shows that interest rate is not the only factor to influence household consumption since R-square statistic is low. That means that there are other factors that influence household consumption.

Table 3: ANOVA test for household consumption and interest rate model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	538409497269410.000	1	538409497269410.000	2677.279	.000[b]
	Residual	2899305918443453.000	14417	201103275192.027		
	Total	3437715415712863.000	14418			

Source: NISR, EICV4
a. Dependent Variable: Household consumption
b. Predictors: (Constant), Interest

ANOVA test revealed that there is an association between household consumption and interest rate since p-value is less than 0.05.

Table 4: Coefficients for household consumption and interest rate model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	299336.597	3747.464		79.877	.000
	Interest	.684	.013	.396	51.742	.000

Source: NISR, EICV4
a. Dependent Variable: Household consumption

The SPSS output from regression of interest on consumption revealed that there is a positive relationship between interest rate and household consumption. One unit change of interest rate results into 0.684, increase in household saving. Then model is written as Household consumption= 299336.597+0.684 Interest rate, whereby 299336.597 is autonomous consumption that a household can consume even if interest remain unchanged, 0.684 is a coefficient of regression that tell us that for one increase of interest rate leads 0.684 increase in household consumption.

9.3. Effects of Interest Rate Changes on Household Saving

Table 5. Shows how household savings behave when interest rate rises

Table 5: How saving change when interest rises

	Frequency	Percent
Go up	291	74.75
Stay the same	98	24.75
Go down	11	0.5
Total	**400**	**100.0**

Source: Primary data, 2018

The majority (nearly 75 percent) reported that when interest rate rises, savings go up. Nearly 25 percent reported that incase interest rate rises saving stay the same and nearly 1 percent reported that when interest rate rises household savings fall down. To check the magnitude effects of interest rate changes on household saving, we run a regression analysis of interest on household saving from data retrieved from Rwanda EICV 4 and below are results:

Table 6: Summary for household saving and interest rate model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.320[a]	.103	.103	264222.046

Source: NISR, EICV4

a. Predictors: (Constant), Interest

R–square shows that interest rate is not the only factor to influence household saving since R-square statistic is low. That means that there are other factors that influence household saving.

Table 7: ANOVA test for household saving and interest rate model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	115080058586360.000	1	115080058586360.000	1648.398	.000[b]
	Residual	1006498198359349.400	14417	69813289752.331		
	Total	1121578256945709.400	14418			

Source: NISR, EICV4

a. Dependent Variable: Saving

b. Predictors: (Constant), Interest

ANOVA test revealed that there is an association between household saving and interest rate since p-value is less than 0.05.

Table 8: Coefficients for household saving and interest rate model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14135.178	2207.989		6.402	.000
	Interest	.316	.008	.320	40.600	.000

Source: NISR, EICV4

a. Dependent Variable: Saving

The SPSS output from regression of interest on saving revealed that there is a positive relationship between interest rate and household saving. One unit change of interest rate results into 0.316, increase in household saving. Then model is written as Household saving=14135.178+0.316 Interest rate, whereby 14135.178 is amount of saving that a household could save even if interest remain unchanged, 0.316 is a coefficient of regression that tell us that for one increase of interest rate leads 0.316 increase in household saving.

10. Conclusion

The objective of this study was to analyze effects of the interest rate changes on the household consumption and saving in Rwanda. The study used a set of primary data and secondary data from EICV4 [2013/2014] and also employed multiple regression analysis for estimation of the model to achieve the above objective. As a country, household consumption and saving play major role in economic growth. As household consumption and saving increase aggregate demand and therefore investment also increases. This calls for the need to give maximum attention to policy makers to set up adequate policies for household consumption and saving in the country. The study results revealed that there is positive relationship between interest rate and household consumption and saving. Even though, study was successfully completed, various limitations were encountered in the course of the study. The study was hampered by financial and material constraints as well as time. There was virtually no funding for the study; all the funding for the study came from the researcher who is already weak financial background. Closing JKUAT Kigali campus also affected the researcher since it was difficult to reach supervisors and inability to access university facilities such as library. To overcome these challenges, researcher used electronic data collection tools to reduce time in data collecting and recording and then enhance quality and accuracy of data as well as results yielded. Also accessing online resources were useful to the completion the study.

11. Recommendations

Reviewing to statistics this research came up, taking account relationships revealed a positive relationship between interest rate changes and household consumption and saving. Therefore, the researcher recommends the following point in order to support policy makers to sustain economic growth and development.

Researcher recommends that government should put strong control on monetary policies to ensure interest rate remain in band whereby encouraging household to save and yet consume appropriately for better welfare.

Since study found that there other variables that influence household consumption and saving than interest rate.

Researcher strongly recommends other researchers to deepen the research on this subject matter to increase the evidence base and promote household consumption and saving by expanding time and adding more variables would be beneficial.

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