The Responsiveness of National Savings to the Monetary Policy and Economic Growth Strategies in Rwanda

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ABSTRACT

National saving is an important fortitude for a sounding economic growth as it can kindle high domestic investments at affordable costs. The closed-open economy model is applied to test the impact of monetary policy proxied by deposit interest rate and economic growth strategies through exports and FDI in Rwanda. This study analysis was performed by the dynamic error correction model to draw the long run relationships among variables using annual time series for the sample period of 1980-2016. The significant impact of FDI and exports on national savings testifies outcome of more efforts by Rwanda to make a business friendly environment to excite foreign investments as well as suitable polices to raise exports. As Rwanda plans to become a middle income country by 2020, monetary policy governance could plan to shape national savings through the profitable deposit interest rate under condition of developed financial system in order to get affordable finances for 2050 plan announced.

Keywords: *National savings; Monetary Policy; Economic growth strategies, Rwanda*

INTRODUCTION

Enough national savings turned out to be a debatable point in economic growth. Researches over time they identified different factors influencing national savings.

In economic growth model of Robert M. Solow, saving was mentioned as a paramount element to the higher capital accumulation which returns into economic growth visa-versa (Solow, 1956).

In the Harrod-Domar model, the savings have been recognized as a necessary condition to the wealthy economic growth as it empowers investment level in the economy(Guru,2016).

The magnitude of savings in the economy was also recognized in the life cycle hypothesis (Modigliani,1985) and hypothesis of permanent income(Friedman, 1957) and at the same time income was mentioned as best basis for savings, taking into consideration ideas of pioneers researches concerning factors spur savings in the economy; they have contributed more for further economics studies over time .

The positive relationship between national saving and efficient pension systems was recognized across the world (Axel Börsch-Supan and Lusardi, 2003), budget deficit has been also mentioned as factor that can negatively affect national saving which resulted into low investments (Gale and Orszag,2004),in USA tax incentives to noncurrent and financial assets with saving subsidies strategy through public spending for low income housing have been used to improve low savings(Johnson and Mensah, 2006), private credits and habit-formation effects were also pointed out to add up private saving(Aghion et al., 2009).

The extremely high Chinese saving rate for the period 1990-2007 as was confirmed by researchers resulted from economic growth, low rate of dependency of old population, low urbanization and weak social safety net (Hung and Qian, 2010), to assess the cause of Tanzanian's national savings ; disposable income, real GDP growth, population growth, inflation, life expectancy were employed and results found all variables except inflation with positive impact (Epaphra,2014), in India, same features found statistically significance on household savings (Samantaraya and Patra, 2014), Ahmad and

Mahmood, (2013) found in Pakistan that gross income, per capita income, exchange rate and inflation are contradictory to national savings while trade openness and money supply were found with positive impact.

Income growth, Financial deepening, government and corporate savings found as determinants of saving in Poland , (Kolasa and Liberda, 2015), in Nigeria , Adelakun, O. Johnson(2015), they have used inflation, income and interest rate drivers of national saving and inflation, interest rate found with negative and positive impact to Nigerian's savings while income was not significant, similarly demographic factors coupled with unemployment, were used in transitional economies to determine level of savings and were found with significant positive causality except unemployment rate with inverse impact (Doker,Turkmen and Emsen, 2016).

In view of previous researches mentioned above, savings in different economies were made either by demographic causes, financial drivers; monetary incident, fiscal policy and behavioral factors. In addition the factors of savings, the heterogeneity of model validity also was learnt throughout earlier works done as no identical national saving model that can vigorous for every economy/country's situation. One set of variables/policies can be effective here and not in other country.

Separately from practical tactic, we are motivated to add to the literature as follow.

First, to make the use of closed-open economy model to inspect and discuss the responsiveness of national savings to the monetary policy through deposit interest rate as a monetary policy tool and economic growth strategies where FDI and Exports have been chosen due to that they are on the top list of priorities strategies taken by Rwanda to reach the middle income economy by 2020.

Second, this article tends to make bigger empirical literature to Rwanda's experience of national savings and presents the existing - recommendations are given as a support to the long term economic growth decision making process in Rwanda.

This paper is prepared where Section 2 deals with methodology. Section 3 deals with empirical analysis and results of the study while the section 4 is the conclusion as well as recommendations to the policy makers.

METHODOLOGY

The Keynesian model of 1939 that shows the main liaison of economic agents, has been remained a foundation of immense literature which has served in various economic policies formulation and researches.

$$Y = C + I + G + X - M \qquad (1)$$

represents national output/Income, C is national consumption, I investment of the economy, G is government spending, X stands for exports of the economy (foreign spending to domestic economy), M represents the total imports of the economy (total spending in the foreign by domestic economy).

In this above equation, both domestic–international incidences can incite influence to the total national output or income Y, the rearrangement of equation (1) can reach the targeted point by this paper.

$$Y - C - G = I + NX \qquad (2)$$

In equation 2 , the left side can represent the total national savings while the right side stands for total investment and trade balance of the economy. Then this leads to the next step where

$$S = I + NX \qquad (3)$$

The vital point of this paper roots on equation (3), where in less developed countries in reality saving is weak to stimulate investments and positive trade balance instead to hold the equilibrium of equation (3), less developed countries, they need to adopt other policies that can increase economy's output/income (Y) which in return will raise up the level of savings that will become later a domestic source of long term investments, otherwise less developed countries they cannot save without income as we now that even their income is weak to please basic needs, with high poverty rate.

To validate this hypothesized thought that national savings can be affected through total economy's income by domestic and foreign factors, DR for representing the role of monetary policy's influence, FDI proxies investment which and exports (EXP) stands for trade balance . The last two show the role of economic policies adopted by Rwanda to amplify the economic growth/ national income. Previously, more researches have used economic growth as driver of national saving in developing countries (Collins, 1991), this highlights the reciprocity which appears in the equation (3) as found by Najarzadeh, Reed and Tasan (2014), which means that every economic governance must be sure that the two variable are associated for being able at every time to influence them from any of their side.

The FDI was recognized by international development agencies as sources of savings (OECD, 2002), in Egypt also FDI and exports have been found positively related to savings(Mohamed, 2003) which means that less developed countries they have to create advantageous business environment to gain those overseas investments give more economic benefits to the economy including employment which affects domestic savings through income to citizens.

Monetary policy proxied by DR influences national savings and during previous researches has been found either with significant positive causality in some less developed economies such Algeria(Berrehouma, 2013) while in Ethiopia findings proved insufficient causality in short run (Ayalew, 2013), the payback on saving deposit was elevating national savings in Malaysia(Abdullah, 2010), both income and interest rate found positively related to national saving in Mauritius (Khadaroo, 2014).

In this work, the research framework is designed in a way to check the impact of economic growth strategies in place and monetary policy influence to raise national savings, to attest this, two hypotheses have been set and proved.

H1: The economic growth strategies impact positively national saving in Rwanda. This hypothesis was set for the sake of checking if there is positive relationship the impact of Investment, export growth, and output growth on national saving as many researchers have revealed(Gemech and Struthers, 2003&Fry, 1998). The hypothesized positive association between savings and economic growth strategies is energized by more efforts that the government of Rwanda has engaged to undertake various economic policies where FDI and Exports are on the top of the list as per Rwandan investment code of 2005 and one of May 2015 and vision 2020 agenda.

This paper takes part of Keynesian model as a basis to perform its empirical analysis, where the national identity equation helps to drawn a part of savings and its drivers. And this paper uses the multiple linear regression form to check the sensitivity of national saving to selected drivers.

$$NS_t = ß0 + ß1 \, DR_t + ß2EXP_t + ß3FDI_t + µ_t \quad (4)$$

Where **NS_t:** National Savings as dependent variable, DR_t: Deposit interest rate at period t, EXP_t: Exports at period t and FDI_t: Foreign Direct Investment at period **t, $ß_0$, $ß_1$, $ß_2$, $ß_3$, $ß_4$,**

$ß_5$ are coefficients and $µ_t$ represents an error term which is assumed to be normally distributed.

EMPIRICAL ANALYSIS

Description of Data

This article has utilized time series secondary data ranged from 1980-2015 as per World Development Indicators (World Bank 2016).To examine the responsiveness of national savings to the change of monetary policy and economic growth strategies. Data computed in thousand billion in current local currency for national saving and exports while deposit interest rate and FDI (% of GDP) are in percentage. The data analysis for Johansen cointegration method which involves Unit root test for stationarity of variables(A. Fuller, 1979) , Vector Autoregressive estimates provides number of cointegrating equation based on the Trace and Eigen value test while Vector Error Correction Model (VECM) by Engle and Granger (1987) is used to check the speed of adjustment of the model as well the short run relation among variables.

Unit Root Test for Time Series

To find the long run connection between national savings and DR, Exports and FDI, the starting point is the check up of whether series are stationary or not by performing the unit root test using ADF test and results are displayed down.

Table1. *Augmented Dickey-Fuller test*

Font Size	Results are with intercept, based on Schwarz information Criterion for maximum lag selection which 9	
	t-test statistics	Probability
d(DNS)	-5.073437***	0.0002
d(DR)	--5.782079***	0.0000
d(EXP)	-3.555700**	0.0123
d(FDI)	-4.439523***	0.0014

*, ** and *** indicates rejection of the null hypothesis of unit root at 10%, 5% and 1% significant level, respectively.

Note: d is the first difference operator, which means that times series are stationary at their first difference.

Based on the results in table 1, all series are stationary at first difference and the use of co-integration test is acceptable. Having achieved stationarity, accordingly, as Engle and Granger (1987) indicate, there should be a co-integration test. The existence of cointegration is the indication of long run affiliation among the variables. The Tarce and Eigen value test displayed one cointegration equation.

Table2. *Johansen co integration test for trace and Maximum Eigen value*

Hypothesized No. of CE(s)	Results for Trace test	
	Trace Statistics	Prob.**
None *	71.08313***	0.0001
At most 1	27.74010	0.0848
At most 2	7.241420	0.5498
At most 3	0.653329	0.4189
Hypothesized No. of CE(s)	Max. Eigen value	
	Max-Eigen stat.	Prob.**
None *	43.34304	0.0002
At most 1	20.49868	0.0611
At most 2	6.588091	0.5390
At most 3	0.653329	0.4189

Trace and Max-eigenvalue tests indicate1 cointegrating equation at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level;

**MacKinnon-Haug-Michelis(1999) p-values

EMPIRICAL RESULTS

Using the dynamic error correction model the results are presented in table 3.

Table3. *The VEC model results*

Variables	Results are with respective lags	
	Coefficients	Probability
Constant	22.39851	0.0007***
DR_{t-1}	1.918693	0.3359
EXP_{t-2}	0.133524	0.3339
FDI_{t-2}	43.95693	0.0003***
Error correction term	**-0.404125**	0.0083***

*, ** and *** indicates rejection of the null hypothesis at 10%, 5% and 1% significant level, respectively.

Based on the VECM, the results are interpreted as follow:

- Consequently national savings in the long run will increase in units by 19.56 ,1.748 ,108.73 from the change of one unit of DR, exports and FDI respectively. Based on long run results it is FDI that has a higher impact which really matches with the economic agenda of Rwanda to transform the economy by making Rwanda a vibrant business area which will attract international capital inflows.

- For the short run results, it is only FDI which its one unit increase has meaningful impact of 43.95693 units on national savings.

- The adjusted R-squared of 75.8% confirms the fitness of the model with all variables and the speed of adjustment coefficient of -0.404 with significance at 1% level shows that disequilibrium is progressively corrected in order to re-establish the long- run equilibrium among cointegrating variables at 40.4% and places of interest the existence of long run relationship between national saving with deposit interest rate, FDI and exports in Rwanda.

- The diagnostic tests revealed the stability and consistent of parameters for the model, are rely on the plot of % critical bound by CUSUM proposed by Brown et al. (1975), absence of serial correlation up to the 16th lag, because all probabilities are greater than 10% level of significance under correlogram squared residuals and Breusch-Pagan-Godfrey proves that the model of study is homoscedastic as the probability of obs*R-squared (48.06%) is greater than 10% level of significance.

CONCLUSION

This article has used variables from two different type of economic growth catalysts; one is DR for monetary policy influence and two (exports & FDI) picked from national comprehensive economic transformation strategies to check how they influence national saving for the period of 1980-2015 and results confirmed the hypothesis one that economic growth strategies increase national saving through FDI as it is significant in short and long term while the other two variables are only significant in the long run. The validity of significance of FDI marks the upshot of more efforts that the Rwanda has put in foreign investments attraction by styling a favorable business atmosphere through Rwanda Development Board , where FDI is clear and specific concern of the government. Based on macroeconomic theories monetary policies can positively influence domestic savings through DR which is more in hand of monetary authorities than other monetary tools but this hypothesis was not valid in this work. The results of this paper bring on following recommendations to make progress of national savings as one way of financial independence and as a condition to have lively economy.

- Monetary authorities could make deposit money in the bank an investment option by increasing deposit interest rate more above inflation rate and this will increase the domestic capital accumulation for the economy and the deposit interest rate is the best tool for monetary authorities as they have more control over it compared to other monetary tools. The central bank could plan to convey undeviating relationship linking savings and deposit interest rate; otherwise economic

agent will invest in other businesses like real estate and other hot dealings. Practically if there is a full-size disparity between deposit and lending interest rate, lenders over exploit depositors which has a negative effect on capital accumulation and this will not stimulate investment significantly latter the economic growth will unhurried .

- Fiscal authorities, they must be always to work in complementarily with monetary authorities by stimulating demand by rising government spending and control the overexpansion when it happen through taxation. For the case of developing economies to increase the capacity of creating jobs it is a condition to increase savings as people they can't save what they don't have.

- The investment promotion legislation could continue to create various strategies to attract foreign direct investments as this remained significant to the Rwandan economy by bringing new value and distributes income among domestic economic agents .The investment promotion legislation could make available spurs to different saving initiatives by different private groups across the country in order to increase enough domestic capital reserves which figure a competitive advantage to the country.

- Saving campaigns: For those who earn any income, they should understand that it is even promising to save before consuming; it is matter of culture not of the amount for one side. Create a habit for profitable savings of a given amount for a given time, to reap at the end of time.

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