

# DETERMINANTS OF PRIVATE SAVINGS IN LESOTHO

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**Abstract:** Savings are necessary if investment, and hence economic growth and development are to be stimulated. The paper looks at the broad set of possible determinants of private savings in Lesotho using annual time series data for the period 1980-2010. The paper estimates the saving rate function and Error-Correction modelling is used to avoid spurious results. The results indicate that public savings are important in explaining changes in private savings, both in the short-run and long-run and that the terms of trade negatively influence private savings in Lesotho in the long-run.

**Keywords:** Co integration, Economic Growth, Error-Correction Modeling, Private Savings, Lesotho.

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## I. INTRODUCTION

Different regions of the world have experienced different patterns of saving rates overtime. Sub-Saharan Africa, in particular, experienced falling saving rates in the period 1970s to 1990s (Loayza et al., 2000). According to Loayza et al. (2000), during the same period different regions encountered different economic growth rates due to varying saving rates since economic growth rates and saving rates are perceived to be correlated by the literature.

On the contrary while countries like China experienced an increase in savings in 1980s and 1990s, Latin America experienced a fluctuation in savings (Ferrucci and Miralles, 2007). Consistent with theory, low private savings and hence low investment levels led to sluggish economic growth levels in Sub-Saharan Africa. According to Elbadawa and Mwege (1998), in Sub-Saharan Africa, private savings as a share of disposable income dropped to 7.5 percent in 1980s from 11.4 percent in the 1970s. In the 1990s, however, the Sub-Saharan region saw a dismal increment of these private savings, which did not even reach 9 percent, from 7.5 percent in 1980s.

Domestic saving rates in Lesotho are not only low but have been showing a systematic decline over the last thirty years, and this not only severely retards the economic growth of the country, but also makes it excessively dependent on foreign capital inflows to finance its investment which leaves it vulnerable to external shocks and changes in investor sentiments towards developing countries. Gross domestic saving is and has been negative since independence in 1966. This is probably due to the fact that migrant labourers in South Africa, who form a significant portion of Lesotho's total labour force, deposit their savings in South African banks, hence why a significant amount of Basotho savings is held in commercial banks in South Africa (Mowatt and Zulu, 1999). In the 1990s, gross domestic savings as a percentage of GDP improved from an average of about -50 percent in 1980s to an average of about -40 percent in 1990s as well as beyond the year 2000. The improvement in domestic savings was as a result of government initiatives in lowering government expenditure coupled with increase in private savings. In 2010 gross domestic savings as a percentage of GDP was -30.89 percent. Its highest value since 1960 is -21.35 percent in 2001, and lowest value is -86.45 percent in 1976.

That notwithstanding, Government has been making some considerable efforts to reduce gross domestic dissaving and considerable efforts have been made to mobilize domestic savings by the concerned stakeholders. However, there remains still a need for a general overhaul of the financial sector. This in particular, calls for improving the network of branches of commercial banks and other financial institutions to improve the accessibility of financial services which in turn would lead to an increase in domestic savings and hence funds for potential investment which would spur a meaningful economic growth.

Since literature suggests that savings are necessary if investment, economic growth and development are to be stimulated, analyzing the factors explaining the level of savings, to determine what needs to be taken into consideration in order to increase savings and hence investment will be of great importance for Lesotho. Savings, investment and output growth are of paramount importance to the overall development of any economy. Therefore, policy issues influencing savings and hence investment and growth need to be conducted efficiently, otherwise the targeted high rate of development in any economy, Lesotho included, may not be achieved and sustainable in the longer term. The purpose of this paper, therefore, is to look at the broad set of possible determinants of private savings in Lesotho using annual time series data for the period 1980-2010.

The rest of this study is organized as follows. Section two reviews the relevant literature. Section three presents the model and the empirical methodology used in the study. Section four presents data and empirical results. And finally, section five concludes the study.

## II. LITERATURE REVIEW

This section reviews the existing theoretical and empirical literature on the determinants of private savings. Economics literature has several theories of savings and its determinants. Some of those theories are reviewed below.

### Deposit Rate:

The seminal work of Shaw (1973) and Mckinnon (1973) emphasized on the role of interest rate in mobilizing savings for productive investment. They suggested that financial repression had retarded the growth of many less developed countries (LDCs). The argument involved interest rate regulations and restrictions that lead to below market rates which hampers the level of savings in an economy. Kiplang'at (2012) found out that deposit rate is an important factor explaining changes in private savings in Kenya.

### Income and Growth:

Keynes (1936) claims that consumption and hence savings are related to the current income. Keynes introduced a short-run consumption function that shows that as income increases people tend to save an increasing percentage of income (Branson, 1988). According to Fry (1980) both savings and investment are determined by the rate of economic growth. Jongwanich (2010) found out that increases in economic growth influence household and private saving rates positively.

### Public Saving:

Public saving may or may not affect private saving depending on the assumptions made. It may have some impact (Keynesian) or it may be fully crowded-out (Ricardo equivalence). With some idle resources in the Keynesian model, the offset coefficient is positive but less than one because budget deficits may lead to an increase in output which in turn generates some offsetting changes in private saving (Elbadawi and Mwege, 1998).

### External Saving:

Literature suggests that external savings and private savings tend to move in opposite offsetting movements. In a case of credit rationing in a country, foreign saving tend to increase at the expense of domestic saving (Masson et al., 1998). This situation, of credit rationing, is particularly common in less developed countries like Lesotho. Bulir and Swiston (2006) found out that external saving offsets private saving in Mexico.

### Terms of Trade:

According to Harberger- Laursen – Metzler (HLM) effect, temporary deterioration in the terms of trade is associated with a decline in saving and vice-versa. This is because households attempt to smooth their consumption following shocks in terms of trade. The effect of a permanent change in terms of trade on saving by households is ambiguous depending on whether or not the change was anticipated.

## III. MODEL AND THE EMPIRICAL METHODOLOGY

### Model:

Based on the foregoing discussion, the saving function for the impending empirical analysis is specified as follows:

$$PSRT = \beta_0 + \beta_1 DPR + \beta_2 PSR + \beta_3 ESR + \beta_4 GDPR + \beta_5 TOT + \varepsilon \dots \dots \dots (1)$$

Where:

$\beta_0$  and  $\beta_i$  for  $i = 1, 2, 3, 4, 5$  are the intercept and slope coefficients respectively and

PSRT = Private Saving Rate

DPR = Real Deposit Rate

PSR = Public Saving Rate

ESR = External Saving Rate

GDPR = Real GDP Growth Rate

TOT = Terms of Trade

$\varepsilon$  = Error Term

### Empirical Methodology:

The cointegration and Error-Correction Methodology (ECM) is utilized in this study. The error-correction modeling procedure involves first estimating the general saving function, after which variables whose coefficients are statistically insignificant are dropped to eventually come up with a parsimonious model. The ECM helps to minimize the possibility of estimating spurious relations, while at the same time retaining long-run information. It achieves this by specifying the relationship being investigated as a dynamic representation with both lagged dependent and independent variables. A major advantage of this method is that it yields an equation with stationary dependent variable and retains long-run information included in the data.

Data analysis is carried out in the following way:

i) Augmented Dickey-Fuller (ADF) test is used to establish the stationarity of the variables by checking for the unit roots. The following equation is estimated for the ADF test for variable Z;

$$\Delta Z_t = \alpha_0 + \beta_1 Z_{t-1} + \delta t + \sum_{i=1}^m \theta_i \Delta Z_{t-i} + \varepsilon_t \dots \dots \dots (2)$$

Whereby if  $\beta_1$  is negative and statistically significant we conclude that the series does not contain a unit root and vice versa.

ii) Likelihood Ratio statistic is relied on to determine the cointegration rank, while Johansen test for cointegration is used to test whether the non-stationary series converge to equilibrium in the long-run. After finding that the linear combination of the variables, in the model, converges to equilibrium the long-run relationship is estimated.

iii) The dynamic model is estimated and subjected to heteroskedasticity, serial correlation and normality tests respectively. The short-run equation includes the lagged error term as a regressor to correct for any deviations from long-run equilibrium.

## IV. DATA AND EMPIRICAL RESULTS

### Data:

Annual time series data for the period 1980-2010 is used to estimate the model. The sample period was determined in accordance with the availability and accessibility of data on the variables under study. The study mainly uses secondary data from World Bank Database.

### Stationarity test:

Testing for the presence of unit roots is of paramount importance in studies that use time series data. The existence of a unit root indicates that a series in question is not stationary and the opposite is also the case. Usage of non-stationary series leads to conclusions that do not make sense hence why non-stationary series are differenced to make them stationary.

The time series nature of each of the variables using the ADF test is presented in Table I. The results show that all the six variables, private saving rate (PSRT), deposit rate (DPR), public saving rate (PSR), external saving rate (ESR), real GDP growth rate (GDPR) and terms of trade (TOT) are non-stationary at level but become stationary after first differencing. Therefore, all the six variables are integrated of order one, I(1).

TABLE I: STATIONARITY TEST RESULTS

Variables	Level		1 <sup>st</sup> difference	
	ADF Statistic	Critical Value	ADF Statistic	Critical Value
PSRT	-0.936670	-2.6560	-3.498626	-2.6649
DPR	-1.919896	-2.6560	-4.648670	-2.6649
PSR	-0.232589	-2.6560	-3.377851	-2.6649
ESR	-2.085646	-2.6560	-2.683545	-2.6649
GDPR	-0.248103	-2.6560	-4.955304	-2.6649
TOT	-0.505499	-2.6560	-2.869918	-2.6649

**Co integration Analysis:**

In this study, Johansen's test is used to carry out the co integration test. Unlike Engle-Granger approach Johansen's test is appropriate if there is more than one co integrating relationships. Co integration analysis combines both the short-run and long-run properties while at the same time maintaining stationarity in all the variables. Table II presents the results for co integration test. According to the results the null hypothesis of no co integration is rejected by the Likelihood Ratio test, but the null hypothesis of three co integration equations is not rejected. Hence, there are three long-run relationships among the six variables. This implies the stationarity of the linear combination of the six series and hence long-run convergence to equilibrium.

TABLE 11: JOHANSEN COINTEGRATION TEST RESULTS

Eigen Value	Likelihood Ratio (L.R)	5% Critical Value	1% Critical Value	Hypothesized number of Cointegration Equation(s)
0.784180	141.5057	94.15	103.18	None**
0.749793	95.50635	68.52	76.07	At most 1**
0.614564	53.94239	47.21	54.46	At most 2*
0.355798	25.34098	29.68	35.65	At most 3
0.230887	12.14868	15.41	20.04	At most 4
0.132759	4.273143	3.76	6.65	At most 5

Notes: (i) \*(\*\*) denotes rejection of the hypothesis at 5 %(1%) significance level.

(ii) L.R. test indicates 3 cointegrating equation(s) at 5% significance level

**Long-Run Model Results:**

Since cointegration results revealed that the variables have long-run equilibrium we estimate the long-run model and the results are presented in Table III below.

TABLE III: LONG-RUN MODEL REGRESSION RESULTS

Variable	Coefficient	t-Statistic	P-Value
PSRT	1.000000	-	-
Constant	-0.655476	-9.495316	0.0000
DPR	0.053949	0.269764	0.7896
PSR	0.201155	-12.77611	0.0000
ESR	0.175867	1.899357	0.0691
GDPR	0.097487	0.273603	0.7866
TOT	-0.101151	-4.684149	0.0001

The real deposit rate (DPR) enters the model statistically insignificantly indicating that private saving rate in Lesotho, in the long-run, is non-responsive to real deposit rate. This is inconsistent with Mackinnon-Shaw hypothesis that an increase

in real deposit rate leads to an increase in savings. The findings support the work of Mwega et al. (1990), but contradict the work of Kiplang'at (2012).

Public saving rate (PSR) has a negative and statistically significant coefficient. A one percent increase in public savings leads to a decrease of about 2.57 percentage points in private saving rate in the long-run. This is probably due to the reason that when government saves, taxes are not likely to increase in future, hence people's fear of government increasing taxes in the future in order to finance its expenditure goes down, and that provides an incentive for households to increase consumption at the expense of saving in the long-run. Jongwanich (2010) also found that public savings less than proportionately crowd out private savings in Thailand.

Private saving rate in Lesotho, as per the results, is influenced by the external saving rate (ESR) in the long-run. Thus a one percent increase in external saving rate leads to a decline of about 0.18 percentage point in private saving rate. The findings are supported by the works of Bulir and Swiston (2006) and Masson et al. (1998). Contrary to Keynesian hypothesis postulation that income growth is an important factor influencing private saving rate, real GDP growth rate (GDPR) does not influence private saving rate in Lesotho.

Terms of trade (TOT) enters the model statistically significantly with a negative coefficient. An improvement in terms of trade by one unit is associated with a decline in private saving rate by about 0.10 percentage point in the long-run. This could be that, due to positive shocks to commodity prices in the international market, borrowing constraints relax and hence consumption increases and private savings fall. Terms of trade, however, can improve due to either improvement in export price index or fall in import price index, both of which lead to positive substitution effects. That is, an increase in consumption and a decline in savings. The findings are contrary to the results of Jongwanich (2010) and Agenor and Aizenman (2004).

#### Dynamic Error-Correction Model:

The optimal lag length of three, for all the variables, determined using Schwarz information criterion (SIC) is used in the general model and then a more desirable model is arrived at using general-to-specific modeling procedure. The specific model results are presented in Table IV. The coefficient of the error-correction term (RES(-1)), as per the estimation results, is negative and statistically significant. The coefficient of approximately -1.131892 indicates that all of previous period deviations from equilibrium are corrected in one year.

In the short-run private saving rate is not responding to changes in real deposit rate. Although the first and third lags of real deposit rate have statistically significant coefficients, they substantially offset each other. Like in the long-run, public saving rate partially offsets private saving rate. The first and third lags of public saving rate interestingly affect private saving rate, but with different signs. Private saving behaviour responds to fiscal policy changes in the short-run in Lesotho. This is contrary to the findings by Nwachukwu and Egwaikhide (2007) that fiscal balance does not affect private saving behaviour in Nigeria in the short-run.

The results show that private saving behavior in Lesotho, in the short-run, is non responsive to external savings. However, previous period external saving rate negatively affect private saving rate. Like in the long-run, real GDP growth rate does not influence the private saving rate in the short-run. However, the third lag of real GDP growth rate affects the private saving rate negatively. Terms of trade does not influence private saving rate in the short-run as per the results.

TABLE IV: DYNAMIC ERROR-CORRECTION MODEL RESULTS

Variable	Coefficient	t-Statistics	P-Value
DPSRT	1.000000		
Constant	-0.004020	-0.618673	0.5477
DPSRT(-1)	0.378432	2.913095	0.0130
DPSRT(-3)	-0.226007	-2.268704	0.0425
DDPR	-0.062036	-0.798460	0.4401
DDPR(-1)	-0.224332	-2.674299	0.0202
DDPR(-3)	0.222748	3.298961	0.0064
DPSR	-2.054643	-6.090898	0.0001

DPSR(-1)	1.646873	3.191507	0.0078
DPSR(-3)	-1.271199	-3.445596	0.0048
DESR	-0.069075	-1.391782	0.1892
DESR(-1)	-0.215696	-3.283316	0.0065
DGDPR	-0.095705	-0.553366	0.5902
DGDPR(-3)	-0.330992	-2.377789	0.0349
DTOT	-0.064361	-0.948323	0.3617
RES(-1)	-1.131892	-6.113057	0.0001

Heteroscedasticity, serial correlation and normality tests, respectively, for the dynamic model are performed. Table V presents the diagnostic tests results. The results from this research, as per the diagnostic tests results, are suitable and can be relied upon.

**TABLE V: DIAGNOSTIC TESTS RESULTS**

Test	Null Hypothesis	F-Statistic	P-Value
ARCH	No conditional heteroskedasticity	0.832651	0.521903
Breusch-Godfrey (LM)	No serial correlation	0.771674	0.573042
Jarque-Bera	There is a normal distribution	2.454037	0.293165

## V. CONCLUSION AND RECOMMENDATIONS

The paper looks at the broad set of possible determinants of private savings in Lesotho using annual time series data for the period 1980-2010. The paper estimates the saving rate function and Error-Correction modeling is used to avoid spurious results. The results indicate that public savings are important in explaining changes in private savings, both in the short-run and long-run and that the terms of trade negatively influence private savings in Lesotho in the long-run.

The government should avoid excessive saving as that would compromise on the private savings and hence private investment and production capacity of the economy. Therefore the fiscal policy should be designed and implemented in a prudent way such that it cannot lead to crowding out of private saving which could exacerbate the already bad unemployment situation in Lesotho.

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