Volume 19 Issue 49
Originally issued as E8



Global Journal of HUMAN-SOCIAL SCIENCE: E
Economics
Volume 19 Issue 8 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460x & Print ISSN: 0975-587X

ARDL Modeling of the Impact of Financial Reforms on Private Domestic Saving in Cameroon

By NEBA Cletus YAH & Ebo' oh Ntjen Salomon Desiree
University of Douala

Abstract- The aim of this study is to model the effects of financial sector reforms on private domestic savings in Cameroon. After building an econometric model of private domestic savings from the theory of financial repression of McKinnon and Shaw (1973), it is analyzed using ARDL co integration approach. The results indicate that there exist a long run negative and significant relationship between private domestic savings and financial reforms. In the short run, this relationship is positive though not significant. On the basis of these results, we recommend that Cameroonian authorities, in their quest for growth and prosperity for the country, should envisage revising the ongoing liberalization process in the country.

Keywords: financial reforms, private domestic savings, ARDL modeling approach.

GJHSS-E Classification: FOR Code: 349999



Strictly as per the compliance and regulations of:



© 2019. NEBA Cletus YAH & Ebo' oh Ntjen Salomon Desiree. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ARDL Modeling of the Impact of Financial Reforms on Private Domestic Saving in Cameroon

NEBA Cletus YAH [α] & Ebo' oh Ntjen Salomon Desiree [σ]

Abstract- **The aim of this study is to model the effects of financial sector reforms on private domestic savings in Cameroon. After building an econometric model of private domestic savings from the theory of financial repression of McKinnon and Shaw (1973), it is analyzed using ARDL co integration approach. The results indicate that there exist a long run negative and significant relationship between private domestic savings and financial reforms. In the short run, this relationship is positive though not significant. On the basis of these results, we recommend that Cameroonian authorities, in their quest for growth and prosperity for the country, should envisage revising the ongoing liberalization process in the country.**

Keywords: financial reforms, private domestic savings, ARDL modeling approach.

I. Introduction

The financial system plays an important role in economic development. It intermediates between savers and borrowers (investors) in the economy. Economies with well-developed financial systems boast of liquidity availability created by financial institutions through the mobilization of savings (resources). The savings are allocated to the different productive investment sectors of the economy. A healthy and developed financial system does not only benefit the economy through savings mobilization but also through increased efficiency of financial intermediation (Levine, 1997). The efficiency of financial intermediation increases the ratio of private domestic savings to income. This in turn will make the process of domestic savings mobilization more effective. Thus efficient resource allocation and financial deepening will be achieved hence economic development (Shaw, 1973). According to Levine (1997), the financial intermediation functions of savings mobilization and the efficient allocation of resources leads to capital accumulation and technological innovation which in turn promotes economic growth and development.

One of the main aims of financial sector reforms is to enhance the efficient mobilization and allocation of private domestic savings in an economy by removing price distortions and decreasing the problem of incentives for both borrowers and lenders. Financial reforms therefore, entail usage of indirect monetary policy instruments, money and capital markets development, liberalization of interest rate and credit control relaxation. These efforts work towards promoting the efficiency of the financial sector in the mobilization and allocation of the savings of the economy (Ngugi, 2000).

Many countries, influenced by economic theories en vogue, applied different financial sector policies with the aim of ensuring the efficiency of financial intermediation. Kase kende and Atingi-Ego (2008) observed that most of the developing countries in the periods from 1970 to mid-1980s were characterized by financial repression. The wisdom behind financial restriction was to persuade financial institutions and other instrument from which the government obtains revenue disregarding other sectors. This was based on Keynes argument that capital formation could only be promoted by keeping interest rates low (Levine, 2001). This theoretical argument came under sharp criticism in the works of McKinnon (1973) and Shaw (1973) who termed the position as financial repression. According to these authors, financial repression policies lead to a loss in the efficiency of the financial sector in saving mobilization and allocation.

McKinnon (1973) and Shaw (1973) argued that LDCs underdevelopment was mainly as a result of financial repression which according to them interferes with financial deepening and financial intermediation. They hold that when interest rates are controlled, savings mobilization through financial institutions will not be allocated efficiently among competitive uses. This implies that the returns on the savings will be unpredictable and unstable. Capital investments are discouraged making the economy to stagnate. Interest rates therefore need to be attractive so as to mobilize more savings for productive and profitable investments. The McKinnon and Shaw hypothesis is based on the assumption that savings are always positively related to real interest rates and that if nominal interest rates are administratively determined, they will always be below the equilibrium level of real interest rates. The expected benefits of financial reforms therefore include among others; an increase in the size of domestic savings channelled through the formal financial sector,

Author α σ: Faculty of Economics and Applied Management University of Douala. e-mail: yah_neba@yahoo.fr

© 2019 Global Journals

increased efficiency of financial intermediation and the effectiveness of monetary policy (Levine (1997). There is therefore need to develop well-functioning financial systems to aid the process of economic development.

A large number of Sub Saharan African (SSA) Countries widely adopted Structural Adjustment Programs (SAPs) in view of reviving their deteriorating economies in the mid-80s (World Bank, 1994). SAPs were basically meant to encourage governments to pursue measures of economic liberalization in order to remove restriction in financial intermediation process, improve resource mobilization, productivity and operational efficiency which had made the process of economic development unachievable (Aryeetey, Hettige, Nissanke, & Steel, 1997). One of the major economic liberalization measures was the reform of the financial sector. Financial liberalization was therefore viewed as a process of allowing market forces to determine who receives or makes credit and what price. The financial liberalization measures that were to be adopted included deregulation of interest rates; elimination or reduction of directed credit control; allowing free entry in the banking sector as well as giving autonomy to commercial banks; allowing private ownership of banks; and liberalizing international capital flows (Odhiambo, 2009).

Cameroon as most of the countries in SSA initiated financial sector reforms in the late 1980s with liberalization of interest rates taking the lead in 1991 followed by removal of credit guidelines, free entry into the banking sector and opening of the financial sector to foreign investors (Noula, 2012). Despite the implementation of these reforms, private domestic savings ratehas been falling and remains very low. Domestic savings divided by GDP stood at 16.19% in 2018 according to the World Development Indicators 2019 online version. This figure is half its 1990 level which stood at 30% when reforms were undertaken. Furthermore, the performance of Cameroon in this indicator is very poor as it is below the average of Sub-Saharan Africa which stands at 18.89% in 2018. For high income countries, the domestic savings rate in 2018 was 24%, making us to believe that the low growth performance observed during the past years can be partly explained by its poor savings rate. As such, if the country intends to accomplish its ambitions of meeting the millennium development goals and becoming an emerging nation in 2035, it needs to increase its efforts in mobilizing financial resources to finance its projects. This might permit the country to realize the minimum required growth rate of 5.5% as stipulated in its Growth and Employment Strategy Paper (GESP) elaborated after the attainment of the completion point of the Heavily Indebted Poor Country (HIPC) Initiative in 2009.

II. Literature Review

The important role played by the financial sector in economic development can be traced back to Schumpeter (1911) who highlighted the key role of banks in facilitating financial intermediation between entrepreneurs who require credit to finance the acquisition of new products. His line of argument was later supported by authors such as Gurley and Shaw (1955), Goldsmith (1969) and Hicks (1969). These authors were in agreement with Schumpeter on the important role that the financial sector plays. They therefore recommended the formulation of policies which aim at enhancing the role of the financial sector in the process of economic development. However, though economists agreed on the important role played by the financial sector, they differed in the policies that would enhance its efficiency. This Keynesians proposed the ideology of financial repression which was highly adopted in developing countries. The governments in these economies used the policy measure of keeping interest rates low in order to finance their fiscal deficits. This measure was preferred because no increase in taxes or inflation was desirable. Other policy measures included high reserve requirement, selected credit to priority sectors of the economy, weak monetary policy and accommodation of government borrowing. There was no incentive to hold money anymore and other financial assets in these economies limiting, as such, credit available to investors. These diminished the size of the banking system and restrained financial intermediation.

The Keynesian ideology was later in the 1970s challenged by McKinnon (1973) and Shaw (1973). McKinnon model argued that since investment is self-financed, there is need therefore to have sufficient savings. On the other hand Shaw's model postulated on the role that financial intermediaries play in the process of economic growth by promoting investment through borrowing and lending. McKinnon (1973) analysed an open economy with little possibility of external finance for vast majority of investors. He argues that because of the lumpiness of physical capital, savers may find it convenient to accumulate funds in monetary assets until they have enough resources to invest in high yielding physical assets. In his words, McKinnon stipulated that deposits may serve as a conduit for capital formation making deposits and capital complementary assets. The availability of deposits generating real rates of returns may thus encourage both savings and capital accumulation. This however is in contrast with the neo-classical theory where these two assets (money and physical assets) are considered substitutes.

Shaw (1973) also stressed on the importance of positive real interest as an inducement to save in financially repressed economies. However unlike

© 2019 Global Journals

McKinnon, Shaw hypothesized on external rather than internal financial possibilities as the effective constraint on capital formation. Focusing on the role of deposits as a source of funds for financial intermediaries, Shaw argues that deposit rates would stimulate investment spending by allowing the supply of credit to expand in line with financial needs.

One clear argument of both Shaw and McKinnon hypothesis is the assumption that savings are always positively related to real interest rates and that administratively determined nominal interest rates were therefore always below the equilibrium market level of real interest rates. Their framework therefore advocates that economies should implement financial liberalization policies in order to enhance the mobilization of domestic savings, improve efficiency in resource allocation among the many investment alternative projects so as to contribute to economic development. Other financial liberalization policies apart from interest rate liberalization include: adoption of measures that enhance security markets development; reserve requirement reduction; privatization of publicly owned financial institutions; removal of entry into the banking sector; directed credit elimination; openness of both the capital and current accounts and enhancing prudential regulation measures (Levine, 2001).

The McKinnon and Shaw school of thought came under sharp criticism in the 1980s by the Neo-Structuralists school lead by Wijnbergen (1983), Taylor (1983) and Buffie (1984) due to their failure of including the informal financial market in the model. This school of thought contends that the benefits associated with financial liberalization will not be realized in the presence of an efficient curb market or informal financial market. This is because commercial banks were still subjected to reserve requirement which hinders efficiency of intermediation between savers and investors. The neo-structuralists school therefore saw households to be holding three types of financial assets which were substitutes. They are bank deposit, currency or gold and curb market loan. After financial liberalization, the neo-structuralists foresaw an increase in bank deposits rates. This will make households to demand more or want to hold more of bank deposits against curb market loans. This increases the cost of getting working capital from the informal sector since their rates will also increase as a result of financial liberalization. This implies that players in the curb market will disappear leading to a transfer of all the funds in this market to the banking system (Ang, 2007).

Later on, Campbell and Mankiw (1990) examined the effect that liquidity constraints could have on private savings rate. They divided households into two types in both developing and developed countries; those that are liquidity constrained and others who are not liquidity constrained. Those households that are liquidity constrained, their consumption is determined by current income while those that are not liquidity constrained can smooth out consumption since they can access capital markets freely. Financial liberalization enables the liquidity constrained households to freely access the capital market hence smoothing their consumption path. This implies that the household consumption has been stimulated at the expense of savings. Therefore a fall in the saving rates will be expected. This means that financial liberalization leads to a fall in private savings rates. This sentiment is shared by a host of other authors who felt that easing credit constrains as a result of financial liberalization reduce the incentive of previously constrained households or individuals to save (Bayoumi, 1993; Jappelli and Pagano, 1994; Bandiera*et al*., 2000).

Other critics of the McKinnon-Shaw framework are found in the works of Stiglitz (1994), Akyuz (1995) and Ogaki, Ostry and Reinhart (1996). According to Stiglitz (1994), financial markets experience imperfections which call for some form of intervention from the government to correct the imperfections. The government should intervene and keep interest rates below their market clearing level. The wisdom behind the government intervention is due to the presence of a certain level of interest rate threshold beyond which will lead to lower lending. This is because the quality of borrowers will be changed in favour of the high risk category.

Akyuz (1995) criticized the efficacy of the McKinnon-Shaw framework in an analysis in which households, private firms and governments were considered. According to the his analysis, a rise in interest rates that result from financial liberalization tends to benefit deposit holding households though they are perceived to be low savers compared to firms. As a result, the profit of the firms falls due to high cost of debt. This further results to a fall in private savings rate since the profit of higher saving firms would have declined as opposed to low saving households who end up getting the highest share of total income. This also happens in public sector savings too since financial liberalization makes interest payments on government debt high. This will reduce tax revenue from interest income leading to a fall in public sector savings. Thus overall savings decline as compared to financial savings.

Ogaki *et al*. (1996) on their part focused on the subsistence level of households in a country. According to them, countries with a significant proportion of households near subsistence level of income, their elasticity of substitution will approach zero whenever there is a change in income. This implies that when interest rates rise as a result of financial liberalization, private savings in these countries will not respond to the rise, thus no effect in the levels of savings. On the

© 2019 Global Journals

contrary, countries which have a significant proportion of its households just above the income subsistence level will have an increase in their levels of private savings as a result of interest rates from financial liberalization.

In summary, there exists a vast body of literature that supports the efficacy of financial liberalization theory. However some authors have argued that fall in savings rates are more pronounced after implementation of financial liberalization policies. The authors have attributed the decline in private savings rate to either income distribution effect (Akyuz, 1995), easing liquidity constraint (Campbell and Mankiw, 1990; 1991; Bayoumi, 1993; Jappelli and Pagano, 1994; Bandiera*et al*., 2000) or presence of subsistence consumption (Ogaki *et al*., 1996). These theoretical arguments against the McKinnon and Shaw hypothesis lead to the question whether financial liberalization has indeed promoted savings mobilization. According to Odhiambo (2009) demystifying this remains as an empirical issue. This study aims at empirically testing the case of Cameroon. An earlier study was carried out in Cameroon by Noula (2012) who used cointegration time series techniques to investigate the effects of financial liberalisation on household savings. He found a long run positive effect of financial liberalisation on household savings. The present study improves on this previous study by using the Autoregressive Distributed Lag (ARDL) cointegration technique which deals with issues of simultaneity bias and short time series that could have flawed the first study.

III. Methodology

a) Model Specification

The theoretical base of financial liberalization is the seminal works of McKinnon (1973) and Shaw (1973). They argued that nominal interest rates which are administratively determined; a situation largely evidenced in LDCs in the 1960s and early 1970s; would hold real interest rates below their equilibrium level. This according to McKinnon and Shaw (1973) is financially repressing. This is because interest rates will be fixed at very low level leading to very low amount of savings that hinders investment levels. According to them, real interest rates at each rate of economic growth are assumed to be positively related to savings. The theory of McKinnon (1973) focuses on demand for real money and investment response to different rates of return. Since the McKinnon theory assumes these two as the only forms of assets held by the private sector, then the McKinnon model can be summarized as follows:

$$M/P = l(y, d-\pi^e, I_p/Y) l_y \succ 0; l_{Ip/Y} \succ 0; l_{d-\pi^e} \succ 0 \quad (1)$$

$$I_p/Y = f(y, d-\pi^e, I_g/Y)\, f_{Ig/Y} \succ 0;\ f_{d-\pi^e} \succ 0 or \prec 0 \quad (2)$$

Equation (1) represents the accustomed long-run real money balances demand function. Real income *y* is the scale variable. The opportunity cost variable represented by $d-\pi^e$ is real interest rate, while private sector investment to Gross Domestic Product (GDP) ratio represented by I_p/Y is the argument. Equation (2) on the other hand is a private sector investment function which depends on real interest rate, real income and public sector investment to GDP ratio (I_g/Y). McKinnon (1973) postulated under equilibrium condition that the ratio of actual investment to income (I/Y) must correspond to existing savings in the economy, thus:

$$I_p/Y = S/Y = f(y, d-\pi^e, I_g/Y) \quad (3)$$

Where, S/Y is the actual savings to income ratio. Since real deposit rates are below equilibrium under a financially repressed economy, there is therefore a positive relationship between savings and the real deposit rate ($d-\pi^e$). This is because a rise in interest rates towards equilibrium induces economic agents to shift from other assets to savings.

In order therefore to get the relationship between savings and growth in the demand for real money balances, equations (1) and (3) are differentiated with respect to arguments and then dividing their differentials, equation (4) is obtained:

$$\frac{d[M/P]}{d[S/Y]} = \frac{d[M/P]/d(.)}{d[S/Y]/d(.)} = \frac{l(.)}{f(.)} \succ 0 \quad (4)$$

Equation (4) above states that there is a positive relation between savings rate and the demand for real money balances. The complementarity hypothesis holds true on the assumption that investment opportunity are plentiful and that the binding constraint is the supply of savings and not the demand for investable funds. Thus savings rate can be incorporated as one of the determinants of demand for real money balances.

© 2019 Global Journals

$$M/P = l(y, S/Y, d-\pi^e, I_p/Y) l_y \succ 0; I_{s/y} \succ 0; l_{Ip/Y} \succ 0; I_{d-\pi^e} \succ 0 \quad (5)$$

Equations (4) and (5) exhibit a case where there is disequilibrium in the money market; where the supply of loanable funds is less than its demand. Thus in the model a rise in real interest rates leads to an increase in savings and also growth in the demand for real money leading to an increase in savings. The problem now is to reverse the complementarity hypothesis. However, since complementarity hypothesis works on both ways in that the conditions of money supply have first order impact on the decision to save and invest, a savings function that must be determined simultaneously with demand for real money is specified as follows:

$$S/Y = f(y, r, M/P, S_f/Y, v) \quad (6)$$

Using equation (5) and since the complementarity hypothesis works in both directions, a savings function is estimated in order to examine the effects of financial reforms on private domestic savings as specified in equation (6).

In order to test the effects of financial reforms on private domestic savings in Cameroon, equation (6) is re-specified to include measures of financial reforms, financial development, real deposit interest rates, and public savings as a proportion of GDP. The equation therefore becomes:

$$S/Y = f(fr, m_2/y, fd, y, tot, s_g, v) \quad (7\})$$

Equation (7) can be written in linear form as follows:

$$PDSG_t = \beta_0 + \beta_1 FR + \beta_2 \ln RMBP_t + \beta_3 FD_t + \beta_4 \ln PGDP_t + \beta_5 \ln TOT_t + v_t \quad (8)$$

Where: PDSG is the ratio of private domestic savings to GDP; RMBP isreal money balances (M2/GDP); FD is financial development (private domestic credit to GDP ratio); PGDP is per capita real GDP; TOT is terms of trade; FR is an index of financial refornsand *v* is the error term. In order to deal with the problem of spurious association and heteroscedasticity which arise from variables trend movements, real money balances and real income have been expressed in per capita terms (Thornton, 1990). Per capita real money balances and terms of trade are expressed in logarithmic form so as to smooth them since they are in ratios. Per capita Real GDP is also expressed in logarithmic form so as to smooth it out since it has large figures. All the variables are constructed by the authors using data from the World Bank's World Development Indicators (WDI) 2019 online version.

b) Measuring financial reforms (FR)

Financial reform is a process that involves the implementation of a number of policies. In order to show the degree or the level of financial reform at a particular time, a financial reform index (FLI) is constructed based on the method proposed by Abiad and Mody (2005). Their measure of financial reform takes into account six different dimensions of financial market policies. These are:

- *Credit controls:* directed credit towards favored sectors or industries, ceiling on credit toward sectors, and high reserve requirements,
- *Interest rate controls:* direct interest rate controls by the government, or interest rate controls through the use of floors, ceilings and interest rate bands,
- *Entry barriers:* licensing requirements for newly established domestic financial institutions, entry barriers for foreign banks, and restrictions on certain types of banking practices, such as specialized bank services or establishing universal banks,
- *Operational restrictions for securities markets:* restrictions on staffing, branching and advertising, and the establishment of securities markets,
- Privatization of financial institutions, and
- *Restrictions on international financial transactions:* capital current account controls and the use of multiple exchange rates.

For each of these six dimensions, a country gets a score that runs from zero to three. The meaning of the scores is as follows:

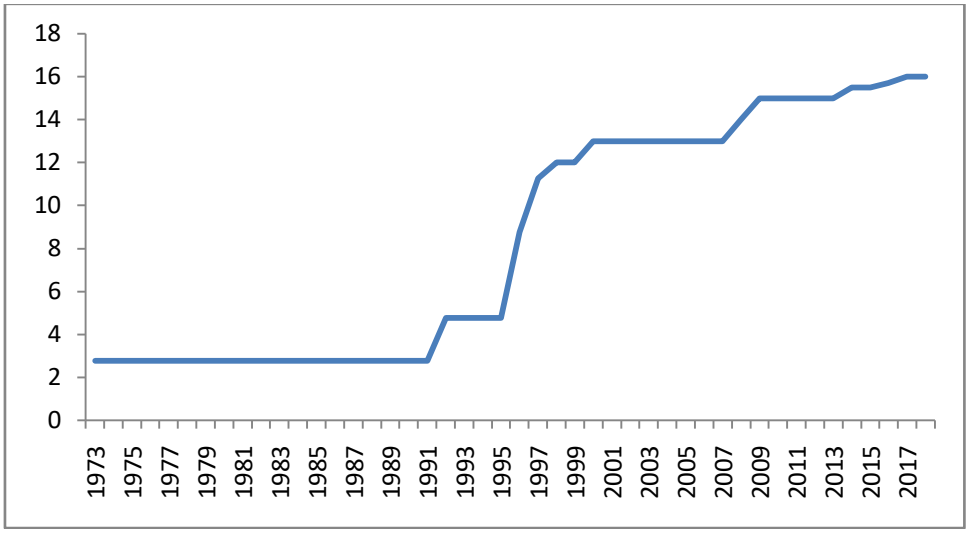
1. means that for a particular dimension of financial market policies, the country is fully repressed;
2. means partial repression;
3. means largely liberalized; and
4. means fully liberalized.

The way the financial reform measure is constructed allows for identifying changes in financial market policies and quantifying the extent to which they contribute to liberalizing financial markets. It also allows us to take into account periods in which governments decide to re-control markets, for instance during or after periods of severe financial and/or economic crisis. In short, the measure enables to determine more exactly the magnitude and timing of changes of various dimensions of financial market policies.

In this study, we consider a time period from 1973 to 2018 and the following dimensions of financial reforms for the construction of the financial liberalization

© 2019 Global Journals

index for Cameroon: credit controls, interest rate controls, entry barriers, privatization of public financial institutions, restrictions on international capital movement, and prudential regulations. Figure1, shows the evolution of the process of financial reforms in Cameroon.



Source: Authors

Figure 1: Evolution of financial reform index in Cameroon

c) ARDLcointegration technique

Equation (8) will be estimated using the ARDL bound testing approach. The bounds technique is based on three validations. First, Pesaran *et al*. (2001) advocated the use of the ARDL model for the estimation of level relationships because the model suggests that once the order of the ARDL has been determined, the relationship can be estimated by OLS. Second, the bounds test allows a mixture of I(1) and I(0) variables as regressors, that is, the order of integration of appropriate variables may not necessarily be the same. Therefore, the ARDL technique has the advantage of not requiring a specific identification of the order of the underlying data. Third, this technique is suitable for small or finite sample size (Pesaran *et al*., 2001).

Following Pesaran *et al*. (2001), we assemble the vector auto regression (VAR) of order *p,* denoted VAR (*p*), for the following saving function:

$$Z_t = \mu + \sum_{i=1}^{p} \beta_i z_{t-i} + \varepsilon_t \tag{9}$$

where z^t is the vector of both x^t and y^t, where y^t is the dependent variable defined as Private Domestic Savings on GDP (PDSG), x_t is the vector matrix which represents a set of explanatory variables i.e., financial reforms(FR), real money balances(RMBP), Financial Development(FD), per capita GDP (PGDP), Terms of Trade(TOT) and Public savings(PS). According to Pesaran *et al*. (2001), y_t must be I(1) variable, but the regressor x_t can be either I(0) or I(1). We further developed a vector error correction model (VECM) as follows:

$$\Delta z_t = \mu + \alpha t + \lambda z_{t-1} + \sum_{i=1}^{p-i} \gamma_t \Delta y_{t-i} + \sum_{i=1}^{p-1} \gamma_t \Delta x_{t-i} + \varepsilon_t \tag{10}$$

Where, Δ is the first-difference operator. The long-run multiplier matrix λ as:

$$\lambda = \begin{bmatrix} \lambda_{YY} \lambda_{YX} \\ \lambda_{XY} \lambda_{XX} \end{bmatrix}$$

The diagonal elements of the matrix are unrestricted, so the selected series can be either I (0) or I(1). If $\lambda_{yy} = 0$, then *Y* is I (1); In contrast, if $\lambda_{yy} < 0$, then *Y* is I (0).

© 2019 Global Journals

The VECM procedures described above are imperative in the testing of at most one cointegrating vector between dependent variable y_t and a set of regressors x_t. To derive the model, we followed the postulations made by Pesaran *et al*. (2001) in Case III, that is, unrestricted intercepts and no trends. After imposing the following restrictions, $\lambda_{yy} = 0$, $\mu \neq 0$ and $\alpha = 0$, the GIIE hypothesis function can be stated as the following unrestricted error correction model (UECM):

$$\Delta(PDSG) = \beta_0 + \beta_1(RMBP)_{t-1} + \beta_2(FD)_{t-1} + \beta_3(PGDP)_{t-1} + \beta_4(TOT)_{t-1} +$$

$$\beta_5(FR)_{t-1} + \sum_{i=0}^{p} \delta_1 \Delta(PDSG)_{t-i} + \sum_{i=0}^{q} \delta_2 \Delta(FR)_{t-i} + \sum_{i=0}^{r} \delta_3 \Delta(RMBP)_{t-i} + \sum_{i=0}^{s} \delta_4 \Delta(FD)_{t-i} + \quad (11)$$

$$\sum_{i=0}^{t} \delta_5 \Delta(PGDP)_{t-i} + \sum_{i=0}^{u} \delta_6 \Delta(TOT)_{t-i} + \mu^t$$

Where Δ is the first-difference operator and u^t is a white-noise disturbance term.

Equation (11) can also be viewed as an ARDL of order (p, *q*, *r*, *s*, *t*, *u*). Equation (11) indicates that private domestic savings ratio tends to be influenced and explained by its past values. The structural lags are established by using minimum Akaike's information criteria (AIC). From the estimation of UECMs, the long-run elasticities are the coefficient of one lagged explanatory variable (multiplied by a negative sign) divided by the coefficient of one lagged dependent variable (Bardsen, 1989). The short-run effects are captured by the coefficients of the first-differenced variables in equation (11).

After regressing Equation (11), the Wald test (*F*-statistic) was computed to differentiate the long-run relationship between the concerned variables. The Wald test is carried out by imposing restrictions on the estimated long-run coefficients. The null and alternative hypotheses are as follows:

$$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \quad \text{(No long-run relationship)}$$

Against the alternative hypothesis

$$H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0 \text{ (Long-run relationship)}$$

The computed *F*-statistic value will be evaluated with the critical values tabulated in Table CI (iii) of Pesaran *et al.* (2001). According to these authors, the lower bound critical values assumed that the explanatory variables x_t are integrated of order zero, or I(0), while the upper bound critical values assumed that x_t are integrated of order one, or I(1). Therefore, if the computed *F*-statistic is smaller than the lower bound value, then the null hypothesis is not rejected and we conclude that there is no long-run relationship between private domestic saving ratio and its determinants. Conversely, if the computed *F*-statistic is greater than the upper bound value, private domestic saving ratio and its determinants share a long-run level relationship. On the other hand, if the computed *F*-statistic falls between the lower and upper bound values, then the results are inconclusive.

IV. Results and Discussions

a) Unit root test results

The order of integration of variables should be checked because ARDL-bounds test approach depends on the time series characteristics of the data sets. Although both I(0) and I(1) variables can be used in the ARDL approach, the variables must not be I(2) stationary because, in the presence of I(2) variables the computed F-statistics provided by Pesaran *et al* (2001) are not valid as the bound test is based on the assumption that the variables are I(0) or I(1). Therefore, the implementation of unit root tests in the ARDL procedure is still necessary in order to ensure that none of the variables is I(2) or higher. The ADF test is applied for unit root test of all series under consideration. The results of the stationarity tests on the variables are presented in table 1 below.

© 2019 Global Journals

Table 1: ADF unit root test results

Variables	ADF TEST STATISTICS		
	Level	First difference	Decision
PDSG	-2.893872	-7.304418***	I(1)
RMBP	-1.129090	-3.627007***	I(1)
FD	-1.439138	-2.643870***	I(1)
PGDP	-1.353104	-5.626483***	I(1)
TOT	-5.871967***	--------	I(0)

Source: Authors calculations

NB: (*), (**), (***) indicates significance at 10%, 5%, and 1% respectively

b) Cointegration test results

The bound test procedure begins by estimating equation (11), followed by the verification of the robustness of the model using several diagnostic tests such as Breusch- Godfrey serial correlation LM test, ARCH test, Jacque-Bera normality test, Ramsey RESET specification test and the CUSUM and CUSUM squared test. All the tests disclosed that the model has the aspiration econometric properties, it has a correct functional form and the model's residuals are serially uncorrelated, normally distributed and homoskedastic. Therefore, the outcomes reported are serially uncorrelated, normally distributed and homoskedastic. Also, the CUSUM and CUSUM squared tests ascertain the stability of the coefficients throughout the period of study. The results of the regression of equation (11) and the different tests are presented in Appendix. Then, finally, the Wald test is used to test restrictions on the long run coefficients in order to ascertain the existence of a long run relationship. The results of the bound test based on the regression results of equation (11) are shown in table 2 below. If a cointegration relationship exists, the long and short run coefficients are then deduced.

Table 2: Bounds Test for Cointegration Analysis

Wald F- Statistics	Critical value	Lower Bound Value	Upper Bound Value
10.20296	1%	3.74	5.06
	5%	2.86	4.01
	10%	2.45	3.52

Note: Computed F-statistic: 10.20296 (Significant at 0.01 marginal values).Critical Values are cited from Pesaran et al. (2001), Table CI (iii), Case 111: Unrestricted intercept and no trend.

As the computed F-statistics (10.20296) is greater than the upper bound at the five percent level (4.01), we conclude that there exist a long run relationship between private domestic saving ratio and its determinants in Cameroon. We then proceed to compute the long and short run coefficients.

c) Long run relationship

The coefficients of the long run relationship between the private domestic savings ratio and its determinants are reported in table 3.

Table 3: Long-run coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FD	-0.148126	0.117092	-1.265045	0.2180
FR	-0.872285	0.197110	-4.425374	0.0002
LOG(PGDP)	14.268669	4.153708	3.435164	0.0022
LOG(RMBP)	-7.821694	4.388518	-1.782309	0.0874
LOG(TOT)	2.764350	2.478589	1.115292	0.2758
C	-134.625705	46.413959	-2.900543	0.0079

Source: Authors' calculations

The results show that there exist a long run negative relationship between financial reforms and private domestic savings ratio in Cameroon. Also, per capita GDP has a very positive impact on private domestic savings.

d) Short run relationship

The estimation of the short run parameters show that there exist a strong error correction mechanism, through the error correction term, that absorbs 94% of a shock the following year. This confirms the existence of the cointegration relationship. In the short run, there is also a positive and significant effect of per capita GDP on private domestic saving ratio.

© 2019 Global Journals

Table 4: Short-run coefficients

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FD)	-0.197790	0.163834	-1.207260	0.2391
D(FR)	-0.442915	0.480818	-0.921170	0.3661
DLOG(PGDP)	23.946474	10.972280	2.182452	0.0391
DLOG(PGDP(-1))	17.202912	9.334074	1.843023	0.0777
DLOG(RMBP)	3.361143	5.692924	0.590407	0.5604
DLOG(RMBP(-1))	6.456417	4.912707	1.314228	0.2012
DLOG(RMBP(-2))	1.094555	5.070514	0.215867	0.8309
DLOG(RMBP(-3))	7.919262	4.534231	1.746550	0.0935
DLOG(TOT)	-1.936732	2.454001	-0.789214	0.4377
DLOG(TOT(-1))	4.111056	3.303551	1.244436	0.2254
DLOG(TOT(-2))	-3.988065	3.109966	-1.282350	0.2120
DLOG(TOT(-3))	-5.814529	3.031494	-1.918041	0.0671
ECT(-1)	-0.935280	0.185527	-7.197221	0.0000

Source: Authors' calculations

V. Conclusion

The objective of this study was to test for the relationship between financial reforms and private domestic saving behavior in Cameroon using an ARDL cointegration modeling approach. The results reveal that there exist a long run negative and significant relationship between financial reforms and private domestic saving ratio in Cameroon. Also, per capita GDP is found to have a positive and significant effect both in the short and long run.

This therefore has significant policy implications for government authorities in Cameroon. In their search for resources to carry out their ambitious programs of higher economic growth and prosperity, they should revise the ongoing reform process in the country so as to permit its financial sector better mobilize domestic resources. This should obviously begin by carrying out further studies so as to determine the effect of each reform measure and even determine their optimal levels.

References Références Referencias

1. Abiad, A., and A. Mody (2005) 'Financial Reform: What Shakes It? What Shapes It?' American Economic Review, 95 (1): 66-88.
2. Akyuz, Y. (1995). Financial liberalization in developing countries: Keynes, Kalecki and the Rentier in *Poverty, Prosperity and the World Economy; Essays in Memory of Sidney Dell*, Gerry Helleiner et al. (eds.), London: MacMillan Press Ltd.
3. Ang, J. (2007). A survey of recent developments in the literature of finance and growth, Discussion Paper 03/07, Department of Economics, Monash University
4. Aryeetey, E., Hettige, H., Nissanke, M., & Steel, W. (1997), Financial Market Fragmentation and Reforms in Ghana, Malawi, Nigeria, and Tanzania, *World Bank Economic Review*, 11(2), 195-218.
5. Bandiera, O., Caprio, G., Honohan, P and Schiantarelli, F. (2000): "Does Financial Reform raise or reduce saving?" Review of Economics and Statistics, Vol. 82, No. 2. PP. 239-263
6. Bardsen, G. (1989) Estimation of long-run coefficients in error correction models, *Oxford Bulletin of Economics and Statistics*, 51, 345-50
7. Bayoumi, T. (1993) "Financial Saving and Household Saving" Economic Journal Vol.103 (November)
8. Buffie, E. F. (1984). Financial Repression, the New Structuralists, and Stabilization Policy in Semi-Industrialized Economies, *Journal of Development Economics* 14, 305-322.
9. Campbell, J., & Mankiw, G., (1990). Permanent income, current income, and consumption *Journal of Business & Economic Statistics*, 8(3), 265-279
10. Goldsmith, R. W. (1969). *Financial Structure and Development*, New Haven: Yale University Press
11. Gurley, J. G., & Shaw, E. S., (1955), Financial Aspects of Economic Development, *American Economic Review* 45, 515-538
12. Hicks, J. R., (1969) *A Theory of Economic History*, Oxford: Oxford University Press
13. Jappelli, T and Pagano, M. (1994): "Saving, Growth and Liquidity Constraints", Quarterly Journal of Economics, Vol. 109. Pp.83-109
14. Jappelli, T., & Pagano, M., (1994) Saving, Growth and Liquidity Constraints, *Quarterly Journal of Economics*, 109, 83-109.
15. Kase kende, L. A., & Atingi-Ego, M. (2008), Financial liberalization and its implications for the domestic financial system: The case of Uganda, *African Economic Research Consortium*
16. Levine, R. (2001). 'International Financial Liberalization and Economic Growth' Review of International Economics, 9 (4): 688-702.

© 2019 Global Journals

17. Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda, *Journal of Economic Literature*, 35(2), 688-726
18. McKinnon, R. I. (1973): Money and Capital in Economic Development, Brookings Institution, and Washington D.C.
19. Ngugi, R. W. (2000). Financial reform process in Kenya: 1989-96. *African Development Review*, 12(1), 52-77
20. Noula, A. (2012) "Financial liberalisation and household savings in Cameroon: A bound testing approach" *Global Advanced Research Journal of Educational Research and Review* Vol. 1(2) pp. 015-024, March, 2012
21. Odhiambo, N. M. (2009). Financial Liberalization and savings in South Africa, *African review of money finance and banking,* 61-74
22. Ogaki, M., Ostry, J. D. & Reinhart, C. M. (1996), Saving Behaviour in Low-Income Developing Countries, *IMF Staff Papers*, 43(1), 38-71
23. Pesaran, M. H., Y. Shin., and Smith R. (2001) Bounds testing approaches to the analysis of level relationships, *Journal of Applied Econometrics,* 16, 289-326
24. Schumpeter, J. A. (1911). *The Theory of Economic Development*, Oxford: Oxford University Press
25. Shaw, G. S. (1973), Financial Deepening in Economic Development, Oxford University Press, New York.
26. Stiglitz, J. E. (1994). The role of the state in financial markets, *Proceedings of the World Bank Annual Conference on Development Economics 1993,* Washington D. C.: The World Bank
27. Thornton, J. (1990). The demand for money in India: A test of McKinnon's complementarity hypothesis, *Savings and Development,* 14, 153-157
28. Wijnbergen, V. S. (1983). Interest Rate Management in LDCs, *Journal of Monetary Economics,* 12, 433-452.
29. World Bank, (1994) *World Development Report,* New York: Oxford University Press

Appendix

Dependent Variable: PDSG
Method: ARDL
Date: 09/06/19 Time: 08:38
Sample (adjusted): 1977 2018
Included observations: 42 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): FD FR LOG(PGDP) LOG(RMBP) LOG(TOT)
Fixed regressors: C
Number of models evalulated: 12500
Selected Model: ARDL(1, 0, 1, 2, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
PDSG(-1)	-0.335280	0.185527	-1.807173	0.0833
FD	-0.197790	0.163834	-1.207260	0.2391
FR	-0.442915	0.480818	-0.921170	0.3661
FR(-1)	-0.721829	0.512492	-1.408469	0.1718
LOG(PGDP)	23.94647	10.97228	2.182452	0.0391
LOG(PGDP(-1))	12.30910	14.19949	0.866869	0.3946
LOG(PGDP(-2))	-17.20291	9.334074	-1.843023	0.0777
LOG(RMBP)	3.361143	5.692924	0.590407	0.5604
LOG(RMBP(-1))	1.664943	5.268594	0.316013	0.7547
LOG(RMBP(-2))	-6.456417	4.912707	-1.314228	0.2012
LOG(RMBP(-3))	-1.094555	5.070514	-0.215867	0.8309
LOG(RMBP(-4))	-7.919262	4.534231	-1.746550	0.0935
LOG(TOT)	-1.936732	2.454001	-0.789214	0.4377
LOG(TOT(-1))	-0.063626	2.946358	-0.021595	0.9829
LOG(TOT(-2))	-4.111056	3.303551	-1.244436	0.2254

© 2019 Global Journals

LOG(TOT(-3))	3.988065	3.109966	1.282350	0.2120
LOG(TOT(-4))	5.814529	3.031494	1.918041	0.0671
C	-179.7630	73.72885	-2.438163	0.0225
R-squared	0.801838	Mean dependent var		21.03716
Adjusted R-squared	0.661473	S.D. dependent var		3.202040
S.E. of regression	1.863044	Akaike info criterion		4.379828
Sum squared resid	83.30243	Schwarz criterion		5.124544
Log likelihood	-73.97639	Hannan-Quinn criter.		4.652796
F-statistic	5.712534	Durbin-Watson stat		1.907854
Prob(F-statistic)	0.000065			

© 2019 Global Journals