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IN CAMEROON USING COINTEGRATION
APPROACH

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Abstract

Purpose: This study explores the empirical relationship between growth rate of real GDP and financial development using Cameroons time series data spanning from 1978 to 2017.

Methodology: After shedding light to the evolution of financial development in Cameroon and exploring some relevant literature, the study assesses the finance-growth linkages in Cameroon by specifying and estimating the long run and short run functions for financial development using cointegration and Error Correction modeling (ECM) techniques in addition to Engle and Granger causality testing.

Findings: Growth of real GDP used in this paper to capture economic growth was reported to have a positive and highly significant relationship with the variable for financial development and the relation was more significant in the short run than in the long run after controlling for other variables. Bidirectional causality was also noticed between the two set of variables.

Unique contribution to theory, practice and policy: Results of this paper suggests that financial sector of Cameroon can efficiently allocate credit to the private sector as an indicator of financial development by stimulating economic activities with the aim of raising gross domestic product of the country in both short and long run.

Keywords*: Economic growth, financial development, cointegration, Cameroon*

1   Introduction

Most modern development economists adhere that there is a need for sound financial systems in developing countries so that the efficiency of credit allocation could be improved. There are considerably different views on how this should be approached. Indeed, the role of financial markets in economic development has been the subject of debate in the academic literature for decades. Evidence show that the role of role of finance on development which was neglected in early literature was later realised in the work of Bagehot (1873) and Schumpeter (1911). To strengthen the finance-growth relations, the 19th Century British Prime Minister- *William Gladstone*, once said "Finance is, as it were, the stomach of the country, from which all the other organs take their tone.

The controversy surrounding the direction and nature of linkage between finance and growth has attracted many scholars. A good number of studies have reported a positive link between finance development and the economic growth such as Xu (2000), Levine *et al*., (2000), Ghirmay, Seetanah *et al*., (2004), and Habibur (2007), Zhang, et al., (2012) Adu (2013), and Adusei (2013). Subsequent empirical work by Hakeem and Oluitan, (2013), Samargandi and Sugata (2014), Elie (2015), Mandiefe, (2015) and Muhammad et al., (2016), Pradhan, et al., (2016), Papadavid, et al., (2017), equally confirmed the finance- growth significant relation. Financial institutions are equally very crucial for firm and industrial expansion as noted by Demirguc-Kunt and Maksimovic (1998) and Rajan and Zingales (1998). Jappelli and Pagano (1994), Tche (1997), and Ram (1999) however, do not find financial sector as an engine of economic.

Most studies focusing exclusively on developing countries such as Demetriades and Hussein (1996), and that of Odhiambo (2004) were in line with the demand-following hypothesis. Odedokun (1996) and Güryay, Şafakli, Tüzel (2007) however found mixed results. Jung (1986) noted that finance causes growth more frequently in developing countries and growth causes finance mostly in industrialized countries. According to Jung (1986) and Yousif (2002) finance- growth nexus is country specific and tend to vary with the proxies used in measuring financial development. It is worth noting that majority of studies on finance- growth linkages concentrated mainly on developed countries with limited empirical research studies based exclusively on developing countries. Taking the particular case of Cameroon, there are very few studies on the finance-growth debates devoted exclusively on Cameroon's data (Tabi, Njong and Neba, 2011 and Asongu 2011)

The world economy has recently been heated with COVID 19 pandemic which required heavy financial expenses which can only be funded by a stable financial system. Astonishingly, Cameroon's financial market develop slowly as indicated by private credit to GDP ratio. Despite this challenges, very few studies have passively attempted to addressed the issue (Tabi, Njong and Neba, 2011, Achamoh and Ngouhouo, 2016). Understanding the nature of linkages between financial development and economic growth or development is therefore a call for concern especially as the country's great ambition for emergence by 2035 requires study of this nature in designing effective policies for the target. In this line, a pertinent question remains that of determining the actual nature of relationship that exist between financial development and in economic growth in Cameroon.

This paper therefore has as an objective, to assess the effect of private credit to GDP ratio on the growth rate Cameroon's real GDP. To attain this objective, the remainder of the paper is organised as follows: Section 2 focuses on the evolution of Cameroon's financial. Section 3 reviews the relevant literature, while Section 4 describes the data and methodology used. Section 5 presents and discusses the empirical results, followed by the conclusion in Section 6.

2   Overview of Cameroon's financial development

Cameroon's financial market comprises of the multinational central bank at the apex, commercial banks, public and semi-public financial institutions (Achamoh & Ngouhouo, 2016). In the early 1970s, there existed three State financial establishments (Cameroon Development Bank- CBD, National Investment Corporation-SNI and the Funds for Rural Development- FONADER), three private (*Le Socièté Camerounaise d'Equipement*- SCE, *Société Camerounaise de Credit Automobile*- SOCCA, and Taw International Leasing- TIL) and, one foreign financial institution (the Central Funds for Economic Corporation- CFEC). The Central Bank by then was the Central Bank for Equatorial Africa (CBEA) together with six commercial banks: Banque Internationale pour L'Afrique Occidentale Cameroun (BIAOC); Banque International pour le Commerce et Industries du Cameroun (BICIC); Cameroon bank (CB); Société Camerounaise de Banque (SCB); Société Générale de Banque au Cameroun (SGBC); Standard Bank of West Africa (SBWA).

With the advent of economic crisis by 1987, and financial crisis thereafter (Bernanke, 2010), a great number of banks especially those with foreign equity holdings withdrew from Cameroon and some local subsidiary were sold. The crisis adversely affected conditions of exploiting credit establishments and led to the liquidation and acquisition of many banks between 1989 and 1992 (Tabi and Zongang, 2006).

The restructuring of the financial sector under the framework of the structural adjustment programs, was put in place. In that line, COBAC was established as a new banking regulatory agency. A good number of banking reforms were implemented such as deregulation of interest rates, and the privatisation of some banks which permitted the economy to regain the path of growth and equally enable the banking sector regained its soundness. On the non-banking sector, the Inter-professional Committee of the Insurance Market (CIMA), established on July 10, 1992 in Yaoundé to regulate and supervise the insurance sector in the country.

To reinforce the strength and performance of the financial institution, BEAC was established with a monetary committee to replace CBEA following the convention signed at Brazzaville (Congo) on 22nd november1972 by Cameroon, Gabon, Congo, RCA and Chad. The number and structure of commercial banks remained the same since 1970 except for the cessation of activities by standard bank of West Africa -SBWA on the 30th June 1974 (Tabi and Nzongang, 2006). According to the National Credit Council report (2000), the network of banks was enriched in 1980 with two new banks; Chase Bank Cameroon (CBC) and Banque de Paris et des Pays-Bas Cameroun (BPPC). From the year 2000, financial sector become more performance as many institutions expanded their activities and the number of commercial banks in the country rose from six recorded in 1998 to eleven by 2008 and to over fifteen as of 2018 (National Credit Council, 2018).

3   Review of related Literature

Since the work of Bagehot (1873) as one of the earliest economists to research on finance-growth nexus, several prominent economists have since then acknowledged that financial systems were a hallmark of an advanced economy, but argued that they did not in themselves contribute to growth. A good number of empirical studies have been conducted on the role of financial development on economic growth. A bulk of these studies find a positive and significant role of finance in determining growth (McKinnon, 1973; Shaw, 1973; King and Levine, 1993; Luintel & Khan 1999; Xu, 2000; Levine *et al*., 2000; Habibur, 2007; Huang, 2010), some find the relationship to be bidirectional (Odhiambo, 2004), Uddin, Sjo, and Shahbaz, (2013) and others find it to be country specific (Yousif, 2002).

According to Schumpeter (1911) the services provided by financial intermediaries stimulate innovation and economic growth while Robinson (1952) added that financial systems emerge in a passive way that responds to the needs of the real economy, that is, where enterprise leads, finance follows. According to Aryeetey (1995), the correlation between financial market development and economic development can be clarified by tracing the McKinnon-Shaw, the structuralists and the imperfect information schools of thought.

Large empirical literature has evolved since the work of Schumpeter (1911) to test the effect of growth and foreign direct investment on financial development. Goldsmith (1969) assess whether finance exerts a causal influence on growth between 1860 and 1963 using data of 35 countries. Capturing financial development as the value of financial intermediary assets divided by GNP, the author found that, financial intermediary size relative to the size of the economy rises as countries develop. He equally reported a positive correlation existing between financial development and economic development. The study however, fails to systematically control for other factors influencing growth and the chosen measure of financial development was questionable.

King and Levine (1993) examine the relationship between financial development and economic growth for 77 countries over the period 1960-1989 and found that real economic growth is positively linked with key indicators of financial development such as the size of the formal sector relative to GDP, M_2 to GDP ratio, proportion of credit to the private sector and the importance of commercial banks relative to the central bank. In the same vein, DeGregorio and Gudotti (1995) investigate the relationship between the degree of financial development and long-run economic growth using private credit ratio as the proxy for financial development. In the case of Latin American countries, the impact of financial liberalization is negative. It hypothesized that the reason for this is the radical and comprehensive liberalization program.

In the year 2000, Levine *et al*. used Generalized Method of Moments dynamic panel estimators and the results show that financial development is a good predictor of economic growth which was consistent with the results of Beck, Levine and Loayza (1999), and Xu (2000). This result was in line with the supply-leading hypothesis which posits a causal relationship from financial development to economic growth (Patrick, 1966; McKinnon, 1973; Jung, 1986; Ghirmay, 2004) as well as the demand-leading hypothesis which postulates a unidirectional causality instead from

economic growth to financial development (Gurley and Shaw, 1967; Goldsmith, 1969; Odhiambo, 2004; Ang and Mckibbin, 2005).

LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1998) collected and summarized information on the legal systems of forty-nine countries. Levine (1998) has examined the relationship between legal systems and banking-sector development to complement LaPorta *et al*. (1998). The author equally examined whether the exogenous component of banking development, the component defined by the legal system, is positively associated with economic development in a cross-section of countries over the 1976-1993 period. King and Levine (1993) show that the level of financial development in 1960 is a good predictor of growth over the next thirty years.

Recent studies strongly support the finance led growth hypothesis by identifying the finance sector as an important source of economic growth. A large number of studies find a positive relationship and a causality running from growth to financial development (Ang and Mckibbin 2005; Erdal, Okan and Beblye, 2007, Achamoh and Baye, 2016). Others however find a positive and significant relationship between finance and growth and a unidirectional causality running from finance to growth (Jung, 1986; Xu, 2000; Ghirmay, 2004; Habibur, 2007, Ang and McKibbin (2005); Odhiambo, (2007); Apergis *et al*., (2007), Yıldırım, Özdemir and Doğan (2013) Hakeem and Oluitan,).

Modern economists have started discovering the unbeatable role of finance in growth and are incorporating it in both literature and empirical studies. Based on the relationship between banking development and economic grow, Ergungor (2003) noted that the mainstream economists are coming to understand that, the banking sector is not a "hand maiden" of growth as it was viewed some thirty years ago, but that a sound, well-functioning financial sector with efficient institutions is a significant determinant of an economy's long term growth prospects.Banking services facilitate economic exchanges by providing among others the means to clear transactions (Ndikumana, 2000).

Vighneswara and Munusamy (2019) studies the relationship between financial development and economic growth in developed countries using a fully balanced panel of 31 years from 1983 to 2013 for 24 economies and the results of the study provide new evidence on the finance-growth relationship. That, there exists a threshold effect of the finance-growth relationship estimated at 142 percent of GDP described in the study as an inverted U-shaped long run relationship. The study employed panel Granger causality test and the results indicate that financial development should be associated with optimal growth performance.

In spite of the bulk of research on financial development and growth relation, empirical study of that nature are scanty using Cameroon time series data such as Tche, (1997 and Tabi, Njong and Neba (2011). Thoroughly examination of the linkages between real GDP growth and financial sector development in Cameroon is therefore a pending gap in research to fill.

4   Methodology

4.1   Econometric model of financial development

To empirical assess relationship between financial development and real GDP growth in Cameroon, the functional model as specified in equation 1, is used

$$FD_t = f(RGDP_t, Con_t, u_t) \qquad (1)$$

Where:

FinD$_t$ is financial development variable (credit to the private sector ratio)

RGDP$_t$ is the variable for a vector of growth rate of GDP

Con$_t$ is a vector of control variables (investment rate, trade openness of the economy, size of the government, rate of inflation, and financial liberalisation among others)

u$_t$ is the error term

4.1.1   Variables Description

Financial Development (FinD)
Financial development is measured in terms the ratio of credit to the private sector to GDP as used in Ghirmay (2004), (2013) and Mandiefe, (2015) among others. This indicator recognizes financial sector as an intermediary and it captures the allocative efficiency of the financial sector which makes it preferable to other indicators[1]. It isolates credit issued to the private sector, as opposed to credit issued to public sector or issued by the central bank. Private credit ratio has been extensively used because it improves on other measures of financial development (Levine *et al*., 2000). Higher level of private credit ratio is interpreted as higher level of financing services and therefore greater financial intermediary development.

Growth rate of real GDP (RGDP)

Expansion in an economy obviously spark the need for financial service as different sectors of the economy demand credit for obvious reasons thereby enhancing the development of the financial sector. The growth rate of an economy captured in this study by annual growth rate of real GDP is therefore expected to have a positive effect on financial development.

The channel through which financial development affect the general level of economic growth are summarized in the following figure with the a priori relationship is indicated with '+' and '-' for positive and negative links respectively.

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[1] Size of the financial sector, Ratio of Commercial bank assets to that of commercial bank/central bank, and Size of the Stock market, as discussed in chapter three
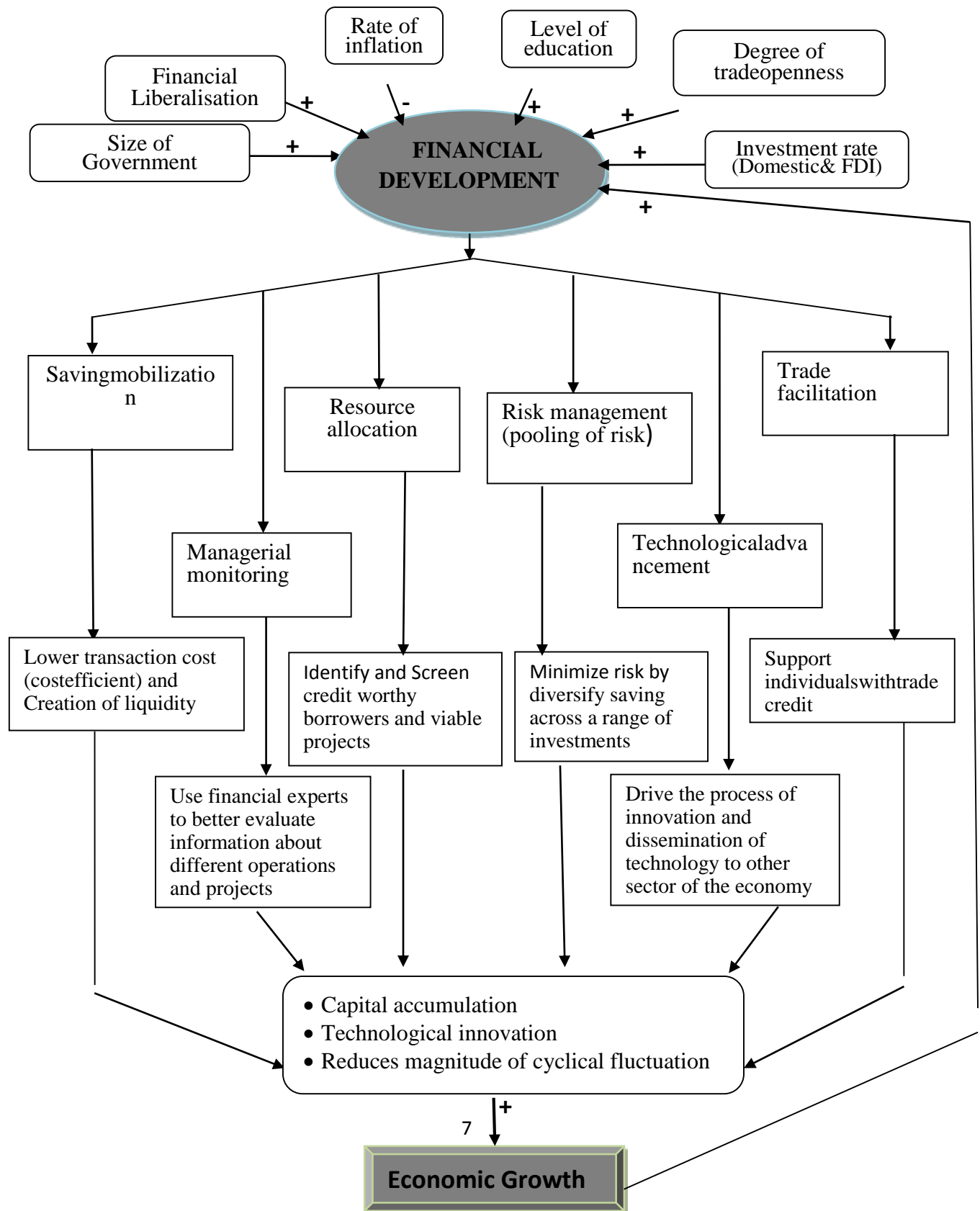
It is noticed from the figure that financial development of a country is the outcome of many macroeconomic variables (predictors). Apart from high rate of inflation which deter financial development (defined in terms of credit to the private sector), the rest of the determinants so far identified tend to foster financial development. Most especially, financial liberalization has a positive relation with financial development as well as the level of gross investments.

4.2 Specification of the long run model to capture finance- growth nexus

To empirical examine the links between financial development and real GDP growth rate, use was made of Cameroon's time series data obtained from WDI (2016), IMF (2018), and National Institute of Statistics (NIS, 2018). The cointegration regression modeling was as specified below:

$$Log(FinD)_t = a_0 + a_1(RGDP)_t + a_2(FinL)_t + a_3Log(GOVT)_t + a_4Log(OPEN)_t$$

$$+ a_5(INFL)_t + a_6Log(INVT)_t + e_t \qquad (2)$$

Where;
   LogFinD is the Log of financial development
   RGDP is the growth rate of real GDP
   FinL is the financial liberalization
   LogGOVT is the Logarithm of total government expenditure
   LogOPEN is the Logarithm of trade openness of the country
   INFL is rate of increase in consumer price index
   LogINVT is the investment rate
   e_t is the error term

4.3 Error Correction Model for finance-growth nexus

To better apprehend a short run relationship between financial development and economic growth variables in the presence study, a flexible dynamic distributed lag model which includes an error correction term from a cointegrating regression as in equation (2) was specified.

$$\Delta Log(FD)_t = a + \sum_{j=0}^{n1} p_{i,j}\, \Delta(RGDP)_{i,\,t\text{-}j} + \sum_{j=0}^{n2} c_{i,j}\, \Delta(FinL)_{i,t\text{-}j} + \sum_{j=0}^{n3} d_{i,j}\, \Delta Log(GOVT)_{i,t\text{-}j} +$$

$$\sum_{j=0}^{n4} m_{i,j}\, \Delta Log(OPEN)_{i,t\text{-}j} + \sum_{j=0}^{n5} n_{i,j}\, \Delta(INFL)_{i,\,t\text{-}j} + \sum_{j=0}^{n1} b_j\, \Delta Log(INVT)_{t\text{-}j} +$$

$$\sum_{j=1}^{n7} q_j\, \Delta Log(FinD)_{t\text{-}j} + \pi ECT_{t\text{-}1} + \mu_t$$

(3)

Where;
   ECT_t is the predicted residual term from a cointegrating regression model
   π is the coefficient of the error correction term

Δ is the difference operator and

μ_t is the error term describe in this case as the white noise, and

Other variables are as defined earlier

4.4   Estimation procedure

Given the limited length of data with 40 years or observations which spans from 1978 to 2017, in the presence study, there was a need to incorporate the cointegration technique of Engle and Granger (1987) rather than the method of cointegration used in similar studies proposed by Johansen (1988). The Engle and Granger (1987)'s cointegration method for time series data has three main steps. First was time series pre-testing for unit roots in which the Augmented Dickey–Fuller (ADF) was employed for that to avoid the risk of dubious regressions. The second step consisted of specifying a long-run cointegrating relationship between the financial development and economic variables as in equation (2). Thereafter, the regression model was estimated by ordinary least squares (OLS), the residual series was tested for unit root and if it was stationary at level form, it attested that Error Correction Model existed to account for short run deviations from the long run equilibrium established in the cointegration model.

The third step was to establish the short-run error-correction model (ECM) using the general-to-specific methodology. To establish ECM from cointegration regression, the error term which has passed stationarity test is lagged and included as one of the explanatory variables in the model. To ascertain the validity of the short run relationship between the two sets of variables, the significance of the lagged error correction term (ECT*t-1*) included in the Error Correction Model (equation 3) is verified. When it is significant, then a conclusion is reached that the financial development and economic growth variables are actually related in the shortrun.

Secondly, causality test using standard Granger-causality approach was conducted to verify the direction of causality between financial development and economic growth variables. The test examined whether or not past changes in financial development helps to explain current changes in growth rate of the real GDP. That is, whether the hypothesis that FinD Granger causes GDP at a given level of significant has to be rejected or not. In order to test for direct short run causality between FD and GR, a pairwise Granger causality test wass performed by estimating equations (4) and (5):

$$LnFinD_t = \phi + \sum_{i=1}^{p} \delta_i \cdot LnRGDP_{t-i} + \sum_{i=1}^{q} \lambda_i \cdot LnFinD_{t-i} + \eta_t \qquad (4)$$

$$LnRGDP_t = \gamma + \sum_{i=1}^{p} \alpha_i LnRGDP_{t-i} + \sum_{i=1}^{q} \beta_i \cdot LnFinD_{t-i} + \mu_t \qquad (5)$$

Where LnRGDP$_t$ and LnFinD$_t$ are stationary time series sequences, γ and ϕ are the respective intercepts, μ_t and η_t is white noise error terms, and, p and q are the maximum lag length used

in each time series. The optimum lag length is identified using Hsiao's (1981) sequential procedure, which is based on Granger's definition of causality and Akaike's (1969, 1970) minimum final prediction error criterion. If in equation (5), $\sum_{i=1}^{k}\beta_i$ is significantly different from zero, then we conclude that FinD Granger causes RGDP. Similarly, if $\sum_{i=1}^{k}\delta_i$ in equation (4) is significantly different from zero, it implies that real GDP Granger causes FinD. Granger causality in both directions is, of course, a possibility. This procedure is repeated to verify the direction of Granger causality between the main variables under study.

5   Empirical Results and discussion

Following the three steps methodology used in this study, the first preoccupation is to report the results of unit root as a pretest, follow by the results of cointegration regression and lastly that of the ECM. This is supplemented by the result of short term causality test. Analysis was done with the help of Microsoft Excel 2016, Eviews 9 econometric software.

5.1   Results of unit roots test.

The table below presents the Augmented Dickey-Fuller (ADF) unit roots test results. This consists of rejecting or accepting the null hypothesis, Ho, of unit roots or non stationarity of the series. The results are presented in the Table (1).

Table 1:   Results of Unit Roots

variables	ADF unit root test		Order of integration
	Level Form	First difference	
Log of Financial development- (LogFinD)$_t$	-1.277	-3.332*	I(1)
Economic growth rate: (RGDP)$_t$	-3.90**	-7.522	I(0)
Log of government spending: (LogGOVT)$_t$	-1.322	-4.101**	I(1)
Rate of inflation: (INFL)$_t$	-3.555*	-6.137	I(0)
Logarithm of trade openness: (LogOPEN)$_t$	-1.301	-4.154**	I(1)
Financial liberalisation dummy: (FinL)$_t$	-1.271	-3.937**	I(1)
Logarithm of investment rate: (LogINVT)$_t$	-2.162	-5.731**	I(1)

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MacKinnon critical values at 1%, 5% and 10% are respectively -3.6496, -2.9558 and -2.6164**. (**),** (*) indicate variables significantly stationary at 1% and 5% levels of confidence respectively.

Source: By Author

The results depict that most of the variables used in this chapter are integrated to the order one, I(1) except the variable for growth rate and that of the rate of inflation.

5.2   Testing for the stationarity of error term

The results of cointegration regression equation of Financial Development are presented in Table (2) with growth rate of real GDP as independent variable

Table 2:   Results of cointegrating regression of Financial Development in Cameroon

Dependent Variable: Log of Financial development- (LogFinD)$_t$				
Method: Two-Stage Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Economic growth rate: (RGDP)$_t$	0.013868	0.007206	1.924672	0.0632
Financial liberalisation dummy: (FL)$_t$	-0.938368	0.146251	-6.416161	0.0000
Logarithm of government spending: (LogGOVT)$_t$	-0.372162	0.180863	-2.057696	0.0478
Logarithm of the degree of openness: (LogOPEN)$_t$	0.050869	0.221977	0.229164	0.8202
Rate of inflation: (INFL)$_t$	-0.000171	0.005115	-0.033389	0.9736
Logarithm of investment rate: (LogINVT)$_t$	0.734308	0.301720	2.433742	0.0207
Constant	1.676498	1.386515	1.209145	0.2355
ADF Test Statistic	-3.8902			
MacKinnon critical values at 1%	*-3.6171*			
R-squared	0.9273			
Adjusted R-squared	0.9136			
S.E. of regression	0.1571			
Durbin-Watson stat	1.4904			
F-statistic	**53.19**(P=0.000)			
Breusch-Godfrey LM Test	**0.857**(*p=0.298*)			

Source: By Author

The results of unit roots test on residuals are included in Table (2). The intention of this test is to verify whether longrun relationships exist between the variables or not. The ADF test on ECT is significant at level form, indicating that the model in stationary at the level form and that the Error correction model actually exist as the calculated value of Augmented Dickey Fuller (-3.8902) is less than MacKinnon critical value at 1 percent (-3.6171). This is an indication that longrun

relationship exists between the variables. The model is highly robust with over 92 percent explanatory power and absence serial correlation.

5.3   Results of Error Correction Model with Financial Development as dependent variable

The results of Error Correction Model reported in Table (3) show that financial development and economic growth have a positive and significant relationship which flows from the later to the former in the short run. This link was arrived at after controlling for other significant determinants of Financial development as inflation rate, the first difference of financial liberalisation, first difference of gross investment rate.

Table 3: Results of Error Correction Model for Financial Development in Cameroon

Dependent Variable: $\Delta(LogFinD)_t$				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
$(RGDP)_{t-1}$	0.034185	0.011169	3.060775	0.0183
$\Delta(FinL)_t$	-0.993282	0.350957	-2.830210	0.0115
$\Delta(LogGOVT)_{t-1}$	-0.356945	1.500222	-0.237928	0.8148
$\Delta(LogOPEN)_t$	-0.888305	4.016311	-0.221174	0.8276
$\Delta(LogINVT)_t$	0.087849	0.044871	1.957801	0.0721
$(INFL)_{t-2}$	-0.103055	0.046642	-2.209495	0.0628
$(ECT)_{t-1}$	0.079935	0.024222	3.300099	0.0057
Constant	3.162191	0.207798	15.21765	0.0000
R-squared	0.753770			
Adjusted R-squared	0.670029			
S.E. of regression	0.418611			
Durbin-Watson stat	2.565274			
F-statistic	**4.695** (*p=0.004*)			
Breusch-Godfrey LM test	**0.416** (*p= 0.379*)			
ARCH test for heteroscedasticity	**0.213** (*p=0.527*)			

Source: By Author

5.4   Results of Engle and Granger causality test.

The Engle and Granger causality test as explained earlier consists of rejecting the null hypothesis (Ho) of which states that there is no causality between financial development and economic growth. The Ho is rejected according to this test whenever the probability of the F-Statistics is less than 10 percent. The results of this test is presented in Table (4).

Table 4: Results of short run causality between growth rate of real GDP and financial development

Null Hypothesis:	Obs	F-Statistic	Probability	Decision
LogFinD does not Granger Cause RGDP		8.143	0.012	reject Ho
LogRGDP does not Granger Cause LogFinD	40	3.915	0.056	reject Ho

Source: Authors calculations

The results of short run causality verify in this paper using Engle and Granger causality test reported in Table (4) depict a bidirectional (two ways) causality between financial development and economic growth variable as the null hypothesis of no causality is rejected in both cases.

5.5   Interpretation and Evaluation of Econometric Results

The coefficient estimates of real GDP growth in the cointegration regression results presented in Table (2) and those of the corresponding Error Correction Model estimated in Table (3) enable us to establish the following empirical relations between economic growth and financial development in Cameroon.

The value for growth rate of real GDP has a positive sign as hypothesized in both short and longrun. The result of cointegrating regression model indicates that the variable is significant only at 10 percent in explaining variations in the total credit to the private sector (financial development) in the long run. The effect of economic growth (real GDP) is equally positive in the short run and relatively highly significant (at 5 percent significant level) in the ECM. The results of Engle and Granger causality test report bidirectional relation between these variables to further shed more light to the results. This implies that growth rate of real GDP contributes to financial development more in the short run than in the longrun. This findings are consistent with those of Do and Levchenko (2004), Chinn and Ito (2005), Habibur (2007), and Seetanah *et al*. (2011), Zhang, et al., (2012) Adu (2013), Mandiefe, (2015) and Muhammad et al., (2016), Pradhan, et al., (2016), Papadavid, et al., (2017) that economic growth significantly fosters financial development.

The cointegration model and ECM reported in Table 2 and 3 respectively are globally significant at one percent, as indicated by the p-value of F-statistics. The Augmented Dickey Fuller's unit root test on the error correction term (ECT) is significant at 1 percent and its coefficient bears the expecetd negative sign, indicating that financial development is really cointegrated with growth of real GDP in Cameroon. The probability (p) of Breusch-Godfrey LM test and heteroscedasticity test indicate that there no evidence of abnormality of error term, unequally distributed variance, and serial correlation of the successive error terms in the two models(CRM and ECM).

6   Conclusion and policy implications

In this paper, residual based cointegration test was applied to investigate the effect of real GDP growth on financial development using Cameroon's time series data from 1978 to 2017. After exploring an overview of financial development in Cameroon, followed with the review of related literature. The results of cointegration test revealed a strong long-run correlation between real GDP growth variable and financial development in the long-run as the residual term was negative and significantly stationary at the level form and equally in the short run. This signifies that the research hypothesis emanating from the objective was attained as real GDP growth used as proxy for economic growth rate has a positive sign as hypothesized. The variable is highly significant in explaining variations in total credit to the private sector (financial development) in the long-run. Bidirectional causality is equally reported between real GDP growth and financial development in Cameroon. Economic growth contributes to financial development and the later intend promotes the former in the short run.

This brings us to the conclusion that, there exist a positive short run and longrun relationship between economic growth and total credit to the private sector in Cameroon. Crucial policy implications of this study is that for the government to achieve the great ambitious programs of higher economic growth and prosperity, policies should be designed to increase the efficiency of the financial sector in allocating credit to the private sector leading to financial development.

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