EXAMINING THE FINANCE- GROWTH NEXUS 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 Cameroon’s 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 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 Société 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 November 1972 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 Aryeeetey (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, M₂ 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 growth, 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 empirically assess relationship between financial development and real GDP growth in Cameroon, the functional model as specified in equation 1, is used

\[ FD_t = f (RGDP_t, Con_t, u_t) \]  

(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.

\(^1\) 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
Saving mobilization

Financial Liberalisation
Size of Government

Rate of inflation
Level of education
Degree of trade openness
Investment rate (Domestic & FDI)

FINANCIAL DEVELOPMENT

Resource allocation
Risk management (pooling of risk)

Managerial monitoring

Identify and Screen credit worthy borrowers and viable projects
Minimize risk by diversify saving across a range of investments

Use financial experts to better evaluate information about different operations and projects

Drive the process of innovation and dissemination of technology to other sector of the economy

Support individuals with trade credit

Lower transaction cost (cost efficient) and creation of liquidity

Capital accumulation
Technological innovation
Reduces magnitude of cyclical fluctuation

Economic Growth
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 empirically 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:

\[
\log(FinD)_t = a_0 + a_1(RGDP)_t + a_2(FinL)_t + a_3(\log(GOV’T))_t + a_4(\log(OP\,EN))_t + a_5(INFL)_t + a_6(\log(INV’T))_t + e_t
\]

(2)

Where;
- \(\log(FinD)\) is the Log of financial development
- \(RGDP\) is the growth rate of real GDP
- \(FinL\) is the financial liberalization
- \(\log(GOV’T)\) is the Logarithm of total government expenditure
- \(\log(OP\,EN)\) is the Logarithm of trade openness of the country
- \(INFL\) is rate of increase in consumer price index
- \(\log(INV’T)\) 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.

\[
\Delta \log(FD)_t = a + \sum_{j=0}^{n_1} p_{t,j} \Delta (RGDP)_{i,t-j} + \sum_{j=0}^{n_2} c_{i,j} \Delta (FinL)_{i,t-j} + \sum_{j=0}^{n_3} d_{i,j} \Delta \log(GOV’T)_{i,t-j} + \sum_{j=0}^{n_4} m_{i,j} \Delta \log(OP\,EN)_{i,t-j} + \sum_{j=0}^{n_5} n_{i,j} \Delta (INFL)_{i,t-j} + \sum_{j=0}^{n_6} b_{j} \Delta \log(INV’T)_{t-j} + \sum_{j=1}^{n_7} q_{j} \Delta \log(FinD)_{i,t-j} + \pi ECT_{t-1} + \mu_t
\]

(3)

Where;
- \(ECT_t\) is the predicted residual term from a cointegrating regression model
- \(\pi\) is the coefficient of the error correction term
\( \Delta \) is the difference operator and \\
\( \mu_t \) 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 short-run.

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 was performed by estimating equations (4) and (5):

\[
LnFinD_t = \phi + \sum_{i=1}^{p} \delta_i \cdot LnRGDP_{t-i} + \sum_{i=1}^{q} \lambda_i \cdot LnFinD_{t-i} + \eta_t
\]  
\[4\]

\[
LnRGDP_t = \gamma + \sum_{i=1}^{p} \alpha_i LnRGDP_{t-i} + \sum_{i=1}^{q} \beta_i \cdot LnFinD_{t-i} + \mu_t
\]  
\[5\]

Where LnRGDP\(_t\) and LnFinD\(_t\) are stationary time series sequences, \( \gamma \) and \( \phi \) are the respective intercepts, \( \mu_t \) and \( \eta_t \) 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).

| variables                                    | ADF unit root test | Order of integration |
|----------------------------------------------|--------------------|----------------------|
|                                              | Level Form         | First difference     |
| Log of Financial development- (LogFinD)<sub>t</sub> | -1.277             | -3.332*              | I(1)                |
| Economic growth rate: (RGDP)<sub>t</sub>     | -3.90**            | -7.522               | I(0)                |
| Log of government spending: (LogGOVT)<sub>t</sub> | -1.322             | -4.101**             | I(1)                |
| Rate of inflation: (INFL)<sub>t</sub>        | -3.555*            | -6.137               | I(0)                |
| Logarithm of trade openness: (LogOPEN)<sub>t</sub> | -1.301             | -4.154**             | I(1)                |
| Financial liberalisation dummy: (FinL)<sub>t</sub> | -1.271             | -3.937**             | I(1)                |
| Logarithm of investment rate: (LogINVT)<sub>t</sub> | -2.162             | -5.731**             | I(1)                |
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) | Method: Two-Stage Least Squares |
|-----------------------------------------------------------|---------------------------------|
| Variable                                                  | Coefficient | Std. Error | t-Statistic | Prob. |
| Economic growth rate: (RGDP) s                              | 0.013868     | 0.007206   | 1.924672    | 0.0632 |
| Financial liberalisation dummy: (FL) s                    | -0.938368    | 0.146251   | -6.416161   | 0.0000 |
| Logarithm of government spending: (LogGOVT) s               | -0.372162    | 0.180863   | -2.057696   | 0.0478 |
| Logarithm of the degree of openness: (LogOPEN) s            | 0.050869     | 0.221977   | 0.229164    | 0.8202 |
| Rate of inflation: (INFL) s                                | -0.000171    | 0.005115   | -0.033389   | 0.9736 |
| Logarithm of investment rate: (LogINVT) s                  | 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: $\Delta(\text{LogFinD})_t$ | Coefficient | Std. Error | t-Statistic | Prob. |
|---------------------------------------------|-------------|------------|-------------|-------|
| $(\text{RGDP})_{t-1}$                       | 0.034185    | 0.011169   | 3.060775    | 0.0183|
| $\Delta(\text{FinL})_t$                     | -0.993282   | 0.350957   | -2.830210   | 0.0115|
| $\Delta(\text{LogGOVT})_{t-1}$              | -0.356945   | 1.500222   | -0.237928   | 0.8148|
| $\Delta(\text{LogOPEN})_t$                  | -0.888305   | 4.016311   | -0.221174   | 0.8276|
| $\Delta(\text{LogINVT})_t$                  | 0.087849    | 0.044871   | 1.957801    | 0.0721|
| $(\text{INFL})_{t-2}$                       | -0.103055   | 0.046642   | -2.209495   | 0.0628|
| $(\text{ECT})_{t-1}$                        | 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 expected 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 long run 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.

References

Achamoh V. N. and Baye F. M., (2016), Implications Of Foreign Direct Investment, Financial Development And Real Exchange Rate For Economic Growth In Cameroon, EuroEconomica. Issue 1(35)/ ISSN: 1582-8859
Achamoh V. N. and Ngouhouo I., (2016) Does Financial Liberalization and Investment Rate Affect Financial Development in Cameroon? International Journal of Economics and Finance; Vol. 8, No. 2; ISSN 1916-971X E-ISSN 1916-9728
Adu G, Marbuah G, Mensah J. T. (2013) Financial development and economic growth in Ghana: does the measure of financial development matter? Review of Development Finance 3(4):192–203
Adusei M (2013) Financial development and economic growth: evidence from Ghana. International Journal of Business and Finance Research 7(5):61–76
Al-Malkawi H. Marashdeh H. A, Abdullah N., (2012) Financial development and economic growth in the UAE: empirical assessment using ARDL approach to co-integration. International Journal of Economics and Finance 4(5):105–115. https://doi.org/10.5539/ijef.v4n5p105
Asongu, S. A. (2011): “New financial intermediary development indicators for developing countries”. MPRAPaper No. 30921
Bagehot, W. (1873). Lombard Street: A Description of the Money Market. London: John Murray.
BEAC. (1992, 1997, 2005, 2010). Etudes et Statistiques. Yaounde, Cameroun.
Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). Law, endowment and finance. Journal of Financial Economics, 70, 137-181. http://dx.doi.org/10.1016/S0304-405X(03)00144-2

Bernanke, B. (2010). Causes of the recent financial crises. Before the financial crises inquiry commission, Washington DC.

Bruno, G. (2010). The Financial and Economic Crisis and Developing Countries. Revue internationale de politique de développement.

Chinn, M. D., & Ito, H. (2005). What matters for financial development? Capital controls, institutions, and interactions. NBER working paper (11370).

Demirgüç-Kunt, A., & Detragiache, E. (1998). Financial Liberalisation and Financial Fragility. International Monetary Fund Working Paper, WP (98/83), Washington, D.C.

Elie N., (2015) Financial development and economic growth in sub-Saharan Africa: a dynamic panel data analysis. European Journal of Sustainable Development 4(2):369–378

Engle, R. F., & Granger, C. W. J. (1987). Cointegration and Error Correction: Representation, Estimation, and Testin. Econometrica, 55, 251-276. http://dx.doi.org/10.2307/1913236

Ghirmay, T. (2004). Financial Development and Economic Growth in Sub-Saharan African Countries: Evidence from Time Series Analysis. African Development Review, 16(3), 415-432.

Goldsmith, R. (1969). Financial structure and development. New Haven: Yale University Press.

Güryay E, Şafakli O. V, Tüzel B (2007) Financial development and economic growth: evidence from northern Cyprus. International Research Journal of Finance and Economics, ISSN 1450-2887(8):57–62

Hakeem, M., & Oluitan, O. (2013). Financial development and economic growth in SSA: a panel econometric approach. Res Appl Econ, 5(2), 42-69. doi: 10.5296/rae.v5i2.1492

Huang, Y. (2010). Determinants of Financial Development. Palgrave, Macmillan. Houndmills, Basingstoke, Hampshire, England. http://dx.doi.org/10.1057/9780230302495

Huran P, Chun W (2013) Financial development and economic growth: a new investigation. J Econ Dev 38(1)

IMF. (2016). International Financial Statistics. Washington D.C.

INS. (2018). Annuaire Statistique du Cameroun. Yaounde.

Jayati, G. (2005). The Economic and Social Effects of Financial Liberalization: A Primer for Developing Countries. DESA Working Paper (4).

Jung, W. (1986). Financial development and economic growth: International evidence. Economic Development and Cultural Change, 34, 333-346. http://dx.doi.org/10.1086/451531

King, R. G., & Levine, R. (1993). Finance and Growth: Schumpeter Might Be Right. Quarterly Journal of Economics, 108(3), 717-737. http://dx.doi.org/10.2307/2118406

Laporta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. Journal of Political Economy, 106, 1113-1155. http://dx.doi.org/10.1086/250042

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature, 25(2), 688-726.
Levine, R. (2001). International Financial Liberalization and Economic Growth. Review of International Economics, 9(4), 688-702. http://dx.doi.org/10.1111/1467-9396.00307

Luintel, B., & Khan, M. (1999). A Quantitative Reassessment of the Finance-Growth Nexus: Evidence from a Multivariate VAR. Journal of Development Economics, 60, 381-405. http://dx.doi.org/10.1016/S0304-3878(99)00045-0

Mandiefe, P. S. (2015) The impact of financial sector development on economic growth: analysis of the financial development gap between Cameroon and South Africa (May 2015). Available at SSRN: https://ssrn.com/abstract=2616296 or doi:10.2139/ssrn.2616296

McKinnon, R. I. (1973). Money and Capital in Economic Development. Washington DC: Brookings Institution.

National Credit Council. (1972, 2000, 2002 and 2008). Progress Report of Cameroon. Yaounde.

Odedokun, M. O. (1996). Alternative Econometric Approaches for Analysing the Role of the Financial Sector in Economic Growth: Time Series Evidence from LDCs. Journal of Development Economics, 50(1), 119-146.http://dx.doi.org/10.1016/0304-3878(96)00006-5

Odhiambo, N. M. (2007). Supply-leading versus Demand-following Hypothesis: Empirical Evidence from Three SSA Countries. African Development Review, 19(2), 257-280.

Rajan, R. G., & Zingales, L. (1998). Financial Dependence and Growth. American Economic Review, 88,559-586.

Samargandi, N. J. F., and Sugata G., (2014). “Is the Relationship between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle Income Countries.” CESifo Working Paper No. 4743. http://www.cesifo-group.de/DocDL/cesifo1_wp4743.pdf

Schumpeter, J. A. (1911). The Theory of Economic Development. Cambridge MA: Harvard University Press.

Seetanah, B., Padachi, K., Hosany, J., & Binesh, S. (2011). Determinants of Financial Development: The Case of Tabi, A. J., Njong, A. M., & Neba, C. (2011). Financial Development and Economic Growth in Cameroon, 1970-2005. Journal of Economics and International Finance, 3(6), 367-375.

Tabi, A. J., Njong, M. A., & Achamoh, N. V. (2012). Modeling Commercial Bank Deposits Mobilization in Cameroon. Cameroon Management Review, (24).

Tche, J. (1997). The Significance of Curb Markets in the Financial Liberalisation Debate. Unpublished Phd Thesis, Guildhall University, London.

Uddin, G. S., Sjo, B., and Shahbaz, M. (2013). The causal nexus between financial development and economic growth in KLenya. Economic modelling, 35, 701-707

Vighneswara S., and Munusamy D., (2019) The dynamics of finance-growth nexus in advanced economies International Review of Economics & Finance Volume 64, Pages 122-146 https://doi.org/10.1016/j.iref.2019.06.001Get rights and content

World Bank. (1989). World Development Report. New York: Oxford University Press.
Xu, Z. (2000). Financial development, investment, and economic growth. Economic Inquiry. http://dx.doi.org/10.1111/j.1465-7295.2000.tb00021.

Yıldırım S, Özdemir B. K, Doğan B (2013) Financial development and economic growth nexus in emerging European economies: new evidence from asymmetric causality. International Journal of Economics and Financial Issues 3(3):710–722

Yousif, K. A. I. Y. (2002). Financial development and economic growth: Another look at the evidence from developing countries. Review of Financial Economics, 11(2), 131-150. http://dx.doi.org/10.1016/S1058-3300(02)00039-32334