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INDUSTRIAL GROWTH VOLATILITY IN CAMEROON: DOES FINANCIAL SECTOR DEVELOPMENT MATTER?

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ABSTRACT
The objective of this paper was to investigate whether changes in financial sector development affect industrial growth volatility in Cameroon. After exploring the related literature on the issue, time series data for 41 years was used spanning from 1979 to 2020 and ARDL bound test estimation technique employed. Findings showed that changes in financial sector development do not significantly affect volatility in industrial growth in the country. Also, financial sector development as a moderating factor renders changes in inflation volatility insignificant in controlling industrial growth volatility in the economy. The authors recommend that stakeholders should implement policies to bridge the gap separating the financial sector and the industrial sector of the country so that they should be interdependent. The financial sector as well should be empowered to meet the demands of the industrial sector for the industrial sector to principally rely on it for finance.

Key Words: *Industrial Growth Volatility, Financial Sector Development, CIP index.*
JEF classification: G19

INTRODUCTION

Industrial sector is the prime economic sector that drives economic growth and development in every economy. Developed economies often referred as industrialised economies are often used interchangeably attributing growth and development to level of industrialisation of an economy. Developing countries need stable and increasing rate of industrialisation to achieve the status of industrialised economies. According to United Nations Industrial Development Organisation (UNIDO) (2023), there is a critical need for industrial development for African nations to be able to achieve sustainable as well as inclusive economic growth. But African economies face setbacks in industrialisation rate because of domestic inefficiencies. Vital economic sectors which can promote industrialisation are either inefficient or disconnected from the industrial sector. Eric and Zhongxiu (2017) underlined that there is a close and important relationship between financial sector development and industrialisation in an economy.

The financial liberalisation theory of Mckinnon (1973) and Shaw (1973) establishes that a liberalised financial sector increases investment in the economy. But African industrialisation depends more on Foreign Direct Investment (FDI), External Debt and Foreign Aid. Excessive external debt leads to debt overhang in most African countries. Debt overhang according to Krugman (1988) and Borensztein (1990) decreases financial sector's ability to finance investment in the economy. It leads to crowding-out hypothesis in Sub-Sahara African countries (Abdullahi et al., 2016), where crowding-out-effect causes increase in interest rates incapacitating the financial sector ability to provide funds for private sector investment. The consequence in African countries is a disconnection of the financial sector from the industrial sector such that volatilities in industrialisation rates do not longer significantly depend on financial sector development and financial sector shocks. Forgha et al. (2014) and Ngangnchi and Joefendeh (2021) attest in their empirical investigations that external debt retard economic growth in Cameroon. Industrialisation rate volatilities rather turn to respond to Foreign aid, FDI and external debts which impede industrialisation in African economies. Aljornaid et al. (2022) found out that the net effect of foreign aid on African industrial growth sectors instead reduces net benefit of overall aid on growth. Economies which rely more on external financing of their industrial sectors are bound to remain unindustrialised like most African economies.

Cameroon industrialisation rate is a call for concern. Cameroon is ranked 122 out of 153 in 2021 Competitive Industrial Performance (CIP) index for African middle-income industrialising economies (UNIDO, 2023). Given that financial sector is the spine of every economy, it becomes imperative to investigate if the industrial sector significantly depends on the financial sector of Cameroon. The objective of this study is therefore to find out whether changes in financial sector development significantly affect industrial growth volatility in the economy of Cameroon. Specifically,

- To investigate the effect of financial sector development on Industrial Growth
- To evaluate the moderating effect of inflation volatility on the FSD-Industrial Growth nexus.

Having introduced the paper in section one, the rest of the sections are structured as follows; Section two discusses the theoretical and empirical literature review. Section three centres on research methodology which elaborates on research design, data collection, data analysis techniques and limitation. The fourth section is reserved for the results and discussion. And the fifth section draws the paper into logical conclusion and making possible recommendations.

LITERATURE REVIEW

Empirical investigations have been made in Cameroon establishing the relationship between financial sector development and economic growth and well as industrialisation. These empirical findings include the work of Tabi et al. (2011) who investigated the relationship between financial development and economic growth in Cameroon using Johanson co-integration technique of analyses. They found that financial development has a positive effect on economic growth in the long run through efficient allocation of financial resources. It was equally observed there was a long term causality relationship from financial development to economic growth. Puatwoe and Piabou (2017), in a similar study investigated the impact of financial sector development on economic growth in Cameroon using the Auto Regressive Distributed Lag (ARDL) technique of estimation. The results showed there exist a short-run positive relationship between monetary mass (M2), government expenditure and economic growth and a short run negative relationship between bank deposits, private investment and economic growth. But in the long run, all indicators of financial development show a positive and significant impact on economic growth.

Eric and Zhongxiu (2017) studied the relationship between financial sector development and industrialisation in Cameroon. Time series data was used and Autoregressive Distributed Lag (ARDL) bound test to cointegration estimation technique employed. Results showed that there exists cointegration where financial sector impacts investment hence industrialisation. They observed nominal deposit rate has an influence on industrialisation in the short run as well as in the long run. However, the influence of bank deposits on investment is only in the short run. In addition, Ntsama et al. (2022) examined the effect of Bank Credits to private sector and gross domestic savings on economic growth in the economy of Cameroon. Time series data was used ranging from 1980 to 2019 and Johanson cointegration estimation techniques employed. Their results indicated that bank credits to private sector and gross domestic savings exhibit positive and significant effect on economic growth in Cameroon. They recommended that banking systems should be promoted to accelerate growth in the country.

These studies have examined the relationship between financial sector development and economic growth as well as industrialisation in Cameroon. All the studies have considered credit market development also referred to as financial institutional development to be the financial sector of Cameroon. Even in the credit market, they focus only on financial depth leaving out financial efficiency and financial access in the market. Thus these studies have not adequately exploited the entire financial sector development and its effect on industrialisation and economic growth in Cameroon. Financial sector development encompasses financial dept, financial efficiency and financial access both in the credit market and the capital market also referred to as financial market. Also, the studies on economic growth do not bring the contribution of financial sector on industrialisation rate as economic growth is an embodiment of the contributions of all sectors of the economy. Lastly, the work of Eric and Zhongxiu (2017) has not come out with how industrialisation volatilities respond to varying level of financial sector development in the economy. This empirical study therefore comes to bridge this gap in existing literature on Cameroon.

RESEARCH METHODS

DATA AND DESCRIPTION OF VARIABLES

Data is collected from secondary sources for a time period of 41years spanning from 1979 to 2020 on Cameroon. Data for industrialisation and inflation were lagged to 1979 in the calculation of their standard deviations for volatilities while the rest of the variables started from 1980. Description of variables and sources of data are summarised in the table below:

Table 3.1. Description of Variables

Variables	Meaning	Source of data
Industrial Growth Volatility	Standard deviations of yearly Industry (including construction) value added (current US$)	WDI
Aggregated Financial Sector Development	Financial Sector Development index	IMF
Disaggregated Financial Sector Development		
-Credit Market Development	Financial Institution Development index	IMF
-Capital Market Development	Financial Market Development index	IMF
Inflation Volatility	Standard deviations of Inflation (consumer price, annual %)	WDI
Exchange rate	Real effective exchange rate index (2010 = 100)	WDI
Economic Size	Real GDP (GDP/GDP deflator)	WDI
Trade openness	(Export+ Import)/GDP	WDI

From the table 3.1 of variable description, industrial growth volatility is the standard deviation of industry value added between time t and t+1 as well as for inflation volatility.

$$\delta_{IGV_t} = (\frac{1}{T}\sum_{t=1}^{T} IGV^2 - \overline{IGV}^2)^{\frac{1}{2}}$$

$$\delta_{IV_t} = (\frac{1}{T}\sum_{t=1}^{T} IV^2 - \overline{IV}^2)^{\frac{1}{2}},$$

Where δ is standard deviation between t and t+1. It shows the degree at which variations in industry value added and consumer prices deviate away from the mean between period t and t+1. Financial sector development constitutes of financial depth, financial efficiency and financial access. According to Estrada et al. (2010), financial depth provides a measure of the size of the financial system relative to size of the economy (GDP). Efficiency of a financial system is the ability of the system to perform its principal role of transforming deposits to credits (Asongu, 2012). Financial access is the measure of the level of availability of financial services of the financial sector of an economy. In the credit market, financial depth constitutes bank credit to the private sector excluding credit issued by the central bank, domestic savings, the assets of the mutual fund and pension fund industries and the size of life and non-life insurance premiums. Credit market efficiency embodies net interest rate margin which is the efficiency in intermediating savings to investment; non-interest income to total income and overhead costs to total assets which measures bank operational efficiency and returns on assets and return on equity which are measures of bank profitability, (Finstats, 2015). Financial institutions access is proxied by the number of bank branches and ATMs per 100,000 adults, number of bank accounts per 1,000 adults, percentage of firms with line of credit, and usage of mobile phones to send and receive money, (Svirydzenka, 2016).

In the capital market, financial market depth is principally measures by the stock market and the bond (debt) market development. The stock market include capitalisation which is the value of listed shares and equally stocks traded as main indicators. Others are debt securities of the domestic financial and nonfinancial corporations and international debt securities of the government (IMF, 2015). Financial market efficiency is measured by stock market turnover ratio, which is the ratio of the value of stocks traded to stock market capitalization. Bond market efficiency is most commonly measured using tightness of the bid-ask spread. Financial market access is measured using the percentage of market capitalization outside of top 10 largest companies as a proxy of access to stock markets. This implies that when there is a higher stock market concentration, it is more difficult to access the stock market for newer or smaller issuers. The number of financial and nonfinancial corporate issuers both in domestic and external debt market in a given year per 100,000 adults is used to measures bond market access (Finstat, 2015). FSD = CMD + KMD

MODEL SPECIFICATION

Three models will be tested to find out whether industrial growth volatility responded to different changes in financial sector development in the economy. These models include aggregated or simply financial sector development model, disaggregated model and model of financial sector development moderating inflation volatility. The financial sector development model (model 1) is given as;

$lnIGV_t = \beta_0 + \beta_1 lnFSD_t + \beta_2 lnIV_t + \beta_3 lnREER_t + \beta_4 lnRGDP_t + \beta_5 lnTO_t + \varepsilon_t$ 3.1

Model 2: Disaggregated model is given as;

$lnIGV_t = \alpha_0 + \alpha_1 lnCMD_t + \alpha_2 lnKMD_t + \alpha_3 lnIV_t + \alpha_4 lnREER_t + \alpha_5 lnRGDP_t + \alpha_6 lnTO_t + \mu_t$ 3.2

Model 3: Model of financial Sector Development moderating the effect of inflation volatility

$lnIGV_t = \gamma_0 + \gamma_1 lnFSD_t + \gamma_2 lnIV_t + \gamma_3 (lnFSD * lnIV)_t + \gamma_4 lnREER_t + \gamma_5 lnRGDP_t + \gamma_6 lnTO_t + V_t$ 3.3

A priori, Coefficients of FSD<0 and Coefficients of IV>0

Where IGV=Industrial Growth Volatility, FSD=Financial Sector Development, CMD=Credit Market Development, KMD=Capital market development, IV=Inflation Volatility, REER= Real Effective Exchange Rate, RGDP=Real Gross Domestic Product, TO=Trade Openness and ε, μ, V are error terms. All the models are logged because they estimated in percentage changes.

Unit root test for stationarity of series is conducted using Augmented Dickey-Fuller test by Dickey and Fuller (1981) and Pillips-Perron (P-P) test by Phillips and Perron (1988). Cointegration test for log run relationship between variables is conducted using the Autoregressive Distributed Lag (ARDL) bound test estimation technique by Pesaran et al. (2001). The bound test to co-integration estimation technique has many advantages. It is efficient in testing for co-integration whether variables are integrated at levels I(0) or at first difference I(1). It can as well efficiently estimate both short run and long run relationships together by incorporating a dynamic Unrestricted Error Correction Model (UECM) in the ARDL bound test model, (Shahbaz at al., 2011). It is also an efficient estimation method in the case where the sample size is relatively small. According to Olokoyo et al. (2009), ARDL bound test produces unbiased estimates with valid statistics even in the case where some of the independent variables are endogenous. The short run-long run ARDL parameters models are given as follows: For Model 1: With aggregated FSD,

$\Delta lnIGV_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta lnIGV_{t-i} + \sum_{j=1}^{q} \beta_{2i} \Delta lnFSD_{t-j} + \sum_{j=1}^{q} \beta_{3i} \Delta X_{t-j} + \beta'_1 lnIGV_{t-1} + \beta'_2 lnFSD_t + \beta'_3 lnX_t + \varepsilon_t$...3.4

Model 2: Disaggregated FSD model

$\Delta lnIGV_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta lnIGV_{t-i} + \sum_{j=1}^{q} \alpha_{2i} \Delta lnCMD_{t-j} + \sum_{j=1}^{q} \alpha_{3i} \Delta lnKMD_{t-j} + \sum_{j=1}^{q} \beta_{4i} \Delta X_{t-j} + \beta'_1 lnIGV_{t-1} + \beta'_2 lnFSD_t + \beta'_3 lnFSD_t + \beta'_4 lnX_t + \mu_t$............................3.5

Model 3: FSD moderating inflation

$\Delta lnIGV_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} \Delta lnIGV_{t-i} + \sum_{j=1}^{q} \gamma_{2i} \Delta lnFSD_{t-j} + \sum_{j=1}^{q} \gamma_{3i} \Delta lnIV_{t-j} + \sum_{j=1}^{q} \gamma_{4i} \Delta (lnFSD * lnIV)_{t-j} + \sum_{j=1}^{q} \gamma_{5i} \Delta X_{t-j} + \gamma'_1 lnIGV_{t-1} + \gamma'_2 lnIV_t + \gamma'_3 lnFSD_t + \gamma'_4 (lnFSD * lnIV)_t + \gamma'_5 lnX_t + V_t$...3.4

Where, X is the vector of other explanatory variables and Δ is the difference operator.

Cointegration with the ARDL bound test is read in consideration of two bounds, the lower critical bound and upper critical bound. If F-Statistic of the bound test is greater than the upper critical bound, there exist long run relationship and if less than the lower critical bound, there is no long run relationship. But where the F-Statistic lies between the two bounds, there is no decision. In the case where integrated is at I(1), decision for cointegration is made in consideration of the upper bound and if integration is at I(0), cointegration decision is made based on the lower bound. Various diagnostic tests are made to check for the reliability of the results. They include test for serial correlation, homoskedasticity test, heteroskedasticity test and normality test. Cumulative Sum Squares (CUSUMSQ) test by Borensztein et al. (1998) is equality conducted to check the long run stability of the results.

PRESENTATION AND DISCUSSION OF RESULTS
UNIT ROOT TEST

Table 4.1. Augmented Dickey-Fuller and Phillips-Perron Unit Root Test

Variable	Dfuller(levels)	PP(levels)	Dfuller(first difference)	PP(first difference)	Order of Integration
lnIGV	-4.967***	-4.891***	-8.542***	-9.776***	I(0)
lnFSC	-2.006	-1.788	-6.618***	-7.016***	I(1)
lnCMD	-2.064	-1.855	-6.646 ***	-7.046***	I(1)
lnKMD	-1.243	-1.400	-4.700***	-4.600***	I(1)
lnIV	-3.640 **	-3.548 **	-6.129***	-6.419***	I(0)
lnREER	-1.447	-1.579	-5.548***	-5.543***	I(1)
lnRGDP	-1.052	-1.319	-5.044***	-4.987***	I(1)
lnTO	-2.552	-2.513	-6.623***	-6.697***	I(1)

***, ** and * show significance at the level of 1%, 5% and 10% *Source: Computed by the authors (2023)*

From Table 4.1, only industrial growth volatility and inflation volatility are stationary at levels I(0) while the rest of the variables are stationary at first difference I(1). Since there exist integration, ARDL bound test cointegration is conduct for long run relationship.

TEST FOR COINTEGRATION

Table 4.2. ARDL Bound Test for Co-integration

Model 1			**Model 2**			**Model3**		
Test Statistics	Value	K	Test Statistics	Value	K	Test Statistics	Value	K
F-Statistics	**10.348**	5	F-Statistics	**10.538**	6	F-Statistics	**8.582**	6
Critical Value bound Significance	lower I(0)	Upper I(1)	Critical Value bound Significance	Lower I(0)	Upper I(1)	Critical Value bound Significance	Lower I(0)	Upper I(1)
10%	2.26	3.35	10%	2.12	3.23	10%	2.12	3.23
5%	2.62	3.79	5%	2.45	3.61	5%	2.45	3.61
2.5%	2.96	4.18	2.5%	2.75	3.99	2.5%	2.75	3.99
1%	3.41	4.68	1%	3.15	4.43	1%	3.15	4.43

Source: Computed by the authors (2023)

Where**,** **Model 1** = Model with Aggregated financial Sector Development; **Model 2** = Model with disaggregated financial sector development and; **Model 3** = Model with FSD moderating inflation volatility. From the three models, there exist cointegration because the F-statistics of 10.348, 10.538 and 8.582 respectively are all greater than the upper critical bounds of each of the respective models. Since there is cointegration in the three models, short run and long rung regression parameters are estimated.

Table 4.3. Model 1: ARDL regression Results with Aggregated Financial Sector Development

VARIABLES	(1) ADJ	(2) LR	(3) SR
lnFSD		-8.198e+09	
		(5.607e+09)	
lnIV		2.381e+07**	
		(9.360e+06)	
lnREER		-5.541e+06*	
		(2.764e+06)	
lnRGDP		1.123**	
		(0.521)	
lnTO		4.746e+08	
		(4.442e+08)	
L.lnIGV	-1.378***		
	(0.206)		
D.lnREER			-2.764e+07**
			(1.058e+07)
D.lnRGDP			5.878**
			(2.492)
D.lnTO			-1.662e+09*
			(8.207e+08)
Constant			1.333e+09

			(1.020e+09)
Observations	40	40	40
R-squared	0.698	0.698	0.698

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 *Source: Computed by the authors (2023)*

Table 4.3 presents the regression results for model 1 with aggregated financial sector development. The model is globally significant with p-value Prob>F=0.0025. R-squared is 0.698 indicating that independent variables included in the model determine industrial growth volatility by 69.8%. The error correction term (ECT) is -1.38 implying shocks in the model are corrected at high speed of 138% and is significant at 1% level. It means corrections are done quarterly or months not up to a year. ECT ranges between 0 and -2 where, 0 and -1is annual correction, and -1 and -2 least is monthly correction (Loayza and Ranciere (2005); Olczyk and Kordalska (2016); Narayan and Smyth (2006); Shittu et al. (2012). Regression relationship results show that financial sector development is inversely related to industrial growth volatility with coefficient -8.2 in the long run. This means, an increase in financial sector development by 1% will reduce volatility in industrial growth rate by 8.2%. It is however insignificant. Secondly inflation volatility is positive related to industrial growth volatility with a coefficient of 2.38 in the long run. This signifies, an increase in inflation volatility in the economy by 1%, will cause an increase in industrial growth volatility by 2.38% and it is significant at 5% level of significance. Also, there is a significant inverse relationship between real exchange rate and industrial growth volatility both in the long run and short run. This implies increase in real exchange rate of Cameroon will reduce the rate of industrial growth volatility in the economy. Real GDP as well has a significant positive relationship with industrial growth volatility both in the long run and short run. Lastly, trade openness is inversely related to industrial growth volatility and significant at 10% level in the short run, but positive and insignificantly related in the long run. From appendix 3, these results do not suffer from autocorrelation, heteroskedasticity and normality problems. They are also stable as shown by cumulative sums square test for stability.

The results are consistent with the a priori expectations and also empirically justified by the findings of Xue (2020). Though the financial sector development shows that it can stabilise industrialisation growth rate in Cameroon, this ability is insignificant. This indicates the industrial sector does not depend on the financial sector explaining the very low rate of industrialisation in Cameroon. This also justifies why Cameroon is ranked 122 out of 153 by Competitive Industrial Performance (CIP) Index by UNIDO (2023). This is equally evident that for Cameroon economy to achieve rapid industrialisation, it cannot principally depend on external financing. There should rather be strong interdependence between the industrial sector and the financial sector.

Table 4.4. Model 2: ARDL regression Results with Disaggregated Financial Sector Development

VARIABLES	(1) ADJ	(2) LR	(3) SR
lnCMD		-3.509e+09	
		(2.398e+09)	
lnKMD		3.566e+10	
		(4.442e+10)	
lnIV		2.248e+07***	
		(7.805e+06)	
lnREER		-2.641e+06	
		(2.951e+06)	
lnRGDP		0.302	
		(0.653)	
lnTO		9.885e+08**	
		(3.935e+08)	
L.lnIGV	-1.616***		
	(0.211)		
D.lnKMD			-2.283e+11**
			(1.025e+11)
D.lnREER			-4.054e+07***
			(1.135e+07)
LD.lnREER			-3.030e+07***
			(1.081e+07)
D.lnRGDP			6.852***
			(2.331)
LD.lnRGDP			8.549***
			(2.865)
D.lnTO			-3.012e+09***
			(8.982e+08)

Constant			7.239e+08
			(1.063e+09)
Observations	39	39	39
R-squared	0.799	0.799	0.799

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 *Source: Computed by the authors (2023)*

Table 4.4 presents the regression result for model 2 with disaggregated financial sector development. The model is globally significant with p-value Prob>F=0.0012. It has an It has an R-squared of 0.799 showing that independent variables included in the model explain industrial growth volatility by 79.9% while shocks in the model are adjusted at the rate of 161.6% within the year which is significant at1% level. Relationship results show that credit market development is inversely related to industrial growth volatility with a coefficient of -3.51 in the long run. Thus an increase in credit market development by 1% will reduce industrial growth volatility by 3.51% and it is insignificant. Capital market development is positively related to industrial growth volatility with a coefficient of 3.57 in the long run. Therefore, an increase in capital market development will increase industrial growth volatility by 3.57% and it is insignificant. Next, inflation volatility is positively related industrial growth volatility with a coefficient of 2.25 in the long run. This implies that, a 1% increase in inflation volatility leads to an increase in industrial growth volatility by 2.25% and it is significant at 1% level of significance.

The results are diagnosed and found that they do not suffer from autocorrelation, heteroskedasticity and normality problems as seen in appendix 2. They are as well stable as presented by CUSUMSQ test of appendix 4. Credit market development and inflation volatility result are consistent with results of model 1. Result of capital market development is contrary to the result of financial sector development in model 1 however is insignificant. This justifies that financial sector of Cameroon does not contribute significantly in the stabilisation of volatilities in industrialisation growth rate in the country.

Table 4.5. Model 3: ARDL regression Results with Financial Sector Development Moderating Inflation Volatility

	(1)	(2)	(3)
VARIABLES	ADJ	LR	SR
lnFSD		-8.522e+09	
		(6.192e+09)	
lnIV		1.450e+07	
		(7.174e+07)	
lnFSD_lnIV		1.661e+08	
		(1.266e+09)	
lnREER		-5.627e+06*	
		(2.874e+06)	
lnRGDP		1.142**	
		(0.547)	
lnTO		4.785e+08	
		(4.515e+08)	
L.lnIGV	-1.381***		
	(0.211)		
D.lnREER			-2.839e+07**
			(1.221e+07)
D.lnRGDP			5.919**
			(2.553)
D.lnTO			-1.694e+09*
			(8.695e+08)
Constant			1.368e+09
			(1.072e+09)
Observations	40	40	40
R-squared	0.698	0.698	0.698

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 *Source: Computed by the authors*

Table 4.5. presents the regression result of model 3 with financial sector development moderating the effect of inflation volatility on industrial growth volatility in Cameroon. The model is globally significant with p-vlue Prob>F =0.0050. R-squared is given as 0.698 indicating that the independent variables included in the model explain industrial growth volatility by 69.8%. Error correction term is given as -1.38 implying that a shock in the model is adjusted at the speed of 138% which is significant at 1% level. Very high speed of corrections can be explained by frequent government interventions and or very spiking financial sector especially in the capital market. From regression relationship results, financial sector development has

an inverse and insignificant long run relationship with industrial growth volatility. When financial sector development is interacted with inflation volatility, it causes inflation volatility as independent variable in the model to become insignificant in determining changes on industrial growth volatility. Financial sector development and inflation volatility moderation effect is equality insignificant in determining changes in industrial growth volatility. This implies that since there is no significant interdependence between the financial sector and the industrial sector, inflation cannot be controlled through the financial sector to stabilise volatility in the growth rate of the industrial sector of Cameroon. Results diagnosed in appendix 5, have no problems.

CONCLUSION AND RECOMMENDATIONS

This study was aimed at examining whether changes in financial sector development of Cameroon affect volatility in industrialisation growth of the economy. Data for the study was collected from WDI and IMF data bases for a time span ranging from 1979 to 2020 and the Autoregressive Distributed Lag (ARDL) bound test to cointegration regression technique was employed. Three models were analysed first, model that aggregates the entire financial sector development. From the model, it was found that financial sector development has an inverse but insignificant relationship with volatility in industrial growth of the country. Second model included disaggregated financial sector development that is made up of credit market development and capital market development. Regression results from it showed that credit market development has inverse but insignificant relationship with industrial growth volatility and the capital market development has direct but insignificant relationship with industrial growth volatility. The last model involved an interaction of financial sector development and inflation volatility and it was observed that, when the financial sector becomes a moderation factor on inflation volatility, inflation volatility becomes insignificant in effecting changes on volatility of industrial growth of Cameroon. In conclusion, the industrial sector of Cameroon does not depend on its financial sector to accelerate the rate of industrialisation in the economy. This implies that, changes in financial sector development of the country cannot stabilise volatilities to accelerate the rate of industrialisation in the economy. That explains why there is low level of industrialisation in Cameroon such that it is ranked very poor in competitive industrial performance index.

We therefore recommend that, Cameroon cannot achieve rapid industrialisation by depending mainly on external financing like Foreign Direct Investment (FDI), foreign aid and external debt. In this regard, stake holders should implement policies to bridge the gap separating the financial sector and the industrial sector of the country so that they should be interdependent. The financial sector as well should be empowered to meet the demands of the industrial sector for the industrial sector to principally rely on it for finance.

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APPENDICES

Appendix 1
Descriptive Statistics

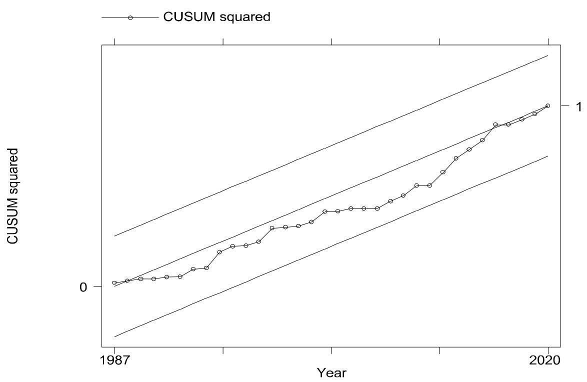
Variable	Obs	Mean	Std. Dev.	Min	Max
lnIGV	41	3.497e+08	3.228e+08	33214206	1.438e+09
lnFSD	41	.073	.012	.048	.096
lnCMD	41	.142	.023	.093	.185
lnKMD	41	.002	.001	.001	.005
lnIV	41	2.63	4.936	.011	27.083
lnREER	41	114.236	23.222	90.205	169.087
lnRGDP	41	2.736e+08	77569727	1.439e+08	3.897e+08
lnTO	41	.454	.088	.262	.65

Appending 2
Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) lnIGV	1.000							
(2) lnFSD	-0.189	1.000						
(3) lnCMD	-0.199	0.999	1.000					
(4) lnKMD	0.111	0.570	0.538	1.000				
(5) lnIV	0.409	-0.452	-0.452	-0.242	1.000			
(6)lnREER	-0.143	-0.680	-0.675	-0.482	-0.061	1.000		
(7)lnRGDP	0.030	0.159	0.139	0.512	-0.353	0.286	1.000	
(8) lnTO	-0.179	0.252	0.257	0.020	-0.202	-0.131	-0.161	1.000

Appendix 3
Durbin-Watson d-statistic(10, 40) = 2.101955

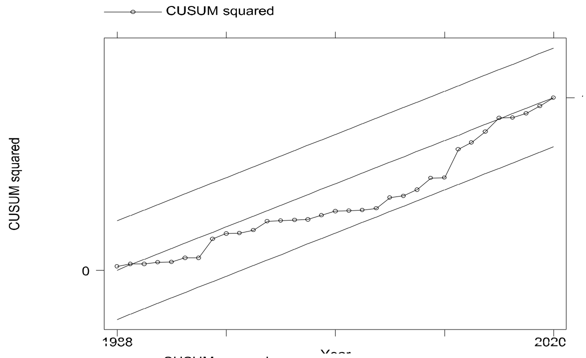
Test	Chi 2	Prob>chi2
Breusch-Godfrey LM test for autocorrelation	1.230	0.2674
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	3.54	0.0599
White's test for Ho: homoskedasticity	40.00	0.4256
Skewness/Kurtosis tests for Normality (resid)	4.71	0.0950



Appendix 4

Durbin-Watson d-statistic(14, 39) = 2.017757

Test	Chi 2	Prob>chi2
Breusch-Godfrey LM test for autocorrelation	0.030	0.8636
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	3.24	0.0717
White's test for Ho: homoskedasticity	39.00	0.4246
Skewness/Kurtosis tests for Normality (resid)	2.10	0.3496



Appendix 5

Durbin-Watson d-statistic(11, 40) = 2.10321

Test	Chi 2	Prob>chi2
Breusch-Godfrey LM test for autocorrelation	1.254	0.2628
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	3.55	0.0597
White's test for Ho: homoskedasticity	40.00	0.4256
Skewness/Kurtosis tests for Normality (resid)	4.29	0.1169