Can Financial Development Incur Budget Deficits? An ARDL Cointegration Analysis for Cameroon

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Abstract

Previous papers investigating the structural determinants of budget deficits in panels of developing and/or developed countries either found that there exists a negative relation between financial development and fiscal balance or that the first is not a significant determinant of the later. This paper asks whether financial development is relevant to explain budget deficits within a country specific context. We use data from Cameroon between 1990 and 2021 and the ARDL bound cointegration technique. Our results show positive significant coefficients in the short-run, statistically not significant coefficients in the long-run and an ECT of – 1.48. In Cameroon, financial liberalization and financial development may lead to fiscal discipline so as to reduce budget deficits progressively. We then recommend enhancing financial development in order to improve the country's fiscal balance management.

Key words: financial development; budget deficits; ARDL cointegration; Cameroon
JEL Classification Codes: E60; G20; H62

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1. Introduction

This article studies the virtues of financial development in a public finance perspective. Despite the merging in Cameroon of the two stock exchanges of Douala and Libreville and, the creation of the treasury bonds public market, Cameroon's budget has structurally shown deficit. Cameroon public finance and growth process have been seriously hampered by hardships related to collapsing oil prices, COVID-19 crisis and security matters (Boko Haram in the Far North Region and separatist violence in the Anglophone Northwest and Southwest Regions)[1]. While monetary authorities have considerably reduced the direct refunding of the public budget by invigorating the bonds public market, the government budget deficit has progressively been reduced.

The financial sector of Cameroon is not well developed, but represents the largest in CEMAC[2]. It is constituted mostly of banks and its underdevelopment can be attributed to financial repression (Puatwoe & Piabuo, 2017). Just like all the countries under the BEAC[3] authority, it underwent critical reforms to recover from the financial crisis and liberalize the financial sector in the early nineties. The financial sector of Cameroon[4] has 15 banks, 26 insurance companies, a state pension fund, and a state-owned mortgage bank. In addition, the country has over 400 microfinance institutions, a state-owned postal bank, and a nascent stock market based in Douala. According to the International Monetary Fund, total financial assets represent 40 percent of national GDP, two-thirds of which is held by banks. Less than 15 percent of Cameroonians have access to financial services, but the financial development has globally increased between 1990 and 2020 as shown in figure 1. The financial development index reached a pic in 2013.

Figure 1: Evolution of the financial development index in Cameroon
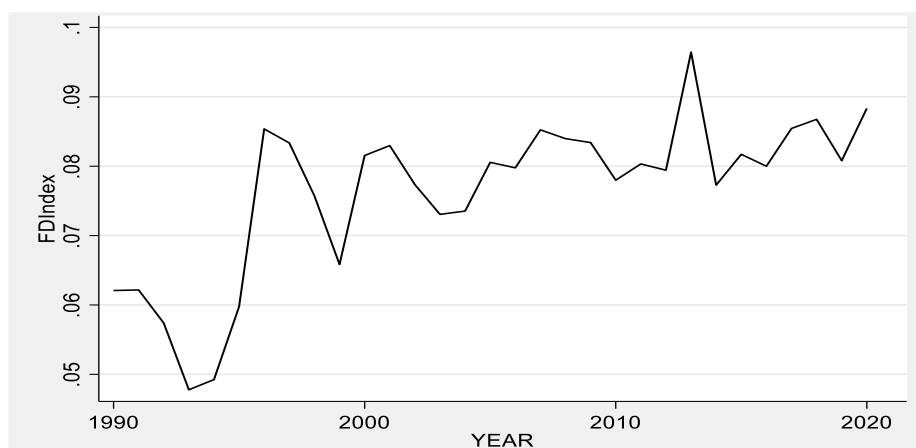
Source: Authors' construction

The theoretical literature linking financial development and public finance is backed by the intuition that financial development in developing countries is the result of financial liberalization (Tayssir & Feryel, 2018) and it may either create difficulties for the Treasury or usher the State unto budget discipline because of the abandonment of the financing privileges that the State obtained from its interventionism on the financial sector (Fry, 1993; Friedman, 1971; Giovannini & De Melo, 1993). The loss of privileges during financial development then

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[1] Information summarized from www.state.gov/report/custom/46bab8f709/
[2] Economic and Monetary Community of Central Africa States
[3] Bank of Central African States
[4] See note 1.

either increases budget deficits/reduces fiscal balances for the first body, or reduces deficits/increases budget balances for the later. Empirical studies have been investigating a large number of macroeconomic, institutional, social and political determinants of government budget deficits in developing and emerging countries since the eighties (Morrison, 1982; Roubini, 1991; Woo, 2003). Recently (Gnimassoun & Do Santos, 2021) relied on this large number of potential determinants to clearly show that external shocks, the debt ratio, financial development, the level of democracy and government control over expenditures are robustly associated with fiscal deficits. Among those structural determinants, financial development seems less documented than macroeconomic variables (inflation rates, external shocks, growth and level of development, debt and interest rates…), quality of institutions (governance, level of democracy, the size of government), political pressure or inequality.

These empirical studies use liquid liabilities, central bank independence index and credit extended by banks to the private sector as a percentage of GDP and investigate the effect of financial development on budget deficits for large number of countries. They then reveal the average relationship between financial developent and budget deficits and undescore the singularities of the link for single countries. This study makes valuable contribution to the existing literature and bridges the gap by examining the importance of financial development in a country specific framework. A second novelty is the use of ARDL bound cointegration technique. It is the solution to determining the long-run relationship between series that are non-stationary, as well as reparameterizing them to the Error Correction Model (ECM). Three main insights came out of this study: i) for a single country budget balance can be sensitive to financial development at least in the short-run and a positive impact is found; ii) in the long-run, public deficit is disconnected from the financial development; iii) the lag cointegration coefficient is -1.48 and significant at 1% level.

The rest of the article is structured as follows. The literature is reviewed in section 2. Section 3 presents the data and strategy employed for the empirical analysis. Section 4 reveals the results and discussion. We conclude the study in section 5.

2. Literature review

Several theoretical arguments underlie the link that can exist between the financial system and the finances of the State. The literature is backed by the intuition that financial development in developing countries is the result of financial liberalization (Tayssir & Feryel, 2018). Both theoretical and empirical studies are inconclusive about the real impact of financial development on budget deficits.

2.1. Theoretical review

For a first strand of literature, financial development creates difficulties for the Treasury in that it causes the abandonment of the financing privileges that the State obtained from its interventionism on the financial sector. This abandonment implies the loss of implicit income and the increase in debt servicing. These implications then affect the state budget.

While Fry (1993) and Friedman (1971) analyze inflation as a tax, Giovannini & De Melo (1993) do the same with financial repression. Financial repression and inflation are treated as levies on private wealth. They therefore provide cheap income to the state. The abolition of public intervention through the introduction of interest rate flexibility, the abolition of reserve requirements and the abandonment of inflationary policies freed up the financial system and increased financial activities. As a result, the state lost all its cheap revenues. The magnitude of

the losses is proportional to the margin of freedom granted to the financial system. With the expansion of financial sector activity, the state is abandoning the privilege of financing its spending at low cost. The primary intuition of financial repression is the freezing of interest rates at artificially low levels. The aim of this policy is the low-cost financing of businesses and public spending. This is a way for the government to reduce its interest payment expenditures. The liberalization of rates results in an increase in these. We see that with financial development, the state loses the privileges it had during the repression. It loses revenues from financial repression and inflation policy; at the same time, it loses pensions related to the low cost of financing its expenses. These losses necessarily have an impact on public finances.

The loss of privileges of interventions in the financial system has as a direct consequence the increase in spending and the increase in the debt burden. The intuition of the school of financial repression is that taxes of repression and inflation are implicit, as are their revenues. Financial development destroys the government's implicit sources of revenue. At a time when spending will become significantly detached from revenue, budget deficits will occasionally widen. Giovannini & De Melo (1993, note 16) thus point out that the income from financial repression is not reflected by an increase in revenues. Rather, it is manifested by the fall in public spending. Financial development therefore accentuates public deficits, particularly budgetary deficits. The most well-known consequence of financial liberalization is the rise in the interest rate. During financial repression, it was kept at low levels to finance the public sector at low costs and minimize interest payments. The increase in interest rates, together with financial liberalization, increases interest payment expenditure and consequently the budget deficit.

For a second strand of the literature, the loss of the privileges of interventionism with financial development requires either the reform of the tax system, or the reduction of expenditure. For Bencivenga & Smith (1992), financial repression is the least expensive form of taxation. The financial repression tax and the inflation tax are often preferred to conventional forms of taxation. They do not charge any cost for their collection, unlike the others. Because of these cheap resources, the government would indulge in fiscal laxity. With financial development and the loss of easy income, tax reform is needed. The reform is necessary to compensate for the loss of revenues from financial repression. Financial development imposes budgetary discipline on the State; balances will improve or deficits will decrease. Similarly, the rising cost of public financing forces the government to discipline its finances, unlike the fanciful spending encouraged by very low costs during financial repression. It will commit to reducing its spending and consequently reducing its deficits.

All the same, Central bank independence requires fiscal discipline. The seigniorage or inflation tax includes the gains obtained by the State through the devaluation of nominal debt, by surprise inflation. All this is linked to a central bank under the formal control of political powers. The guarantee of financing and the benefit of preferential conditions for the central bank are undoubtedly incentives for fiscal laxity. On the other hand, entrusting the issuing institution with an objective of price stability prohibits the use of the "printing press" or any privileged access to credit to finance deficits (Pisani-ferry & Bénassy-Quéré, 1994). Financial development accompanied by an independent central bank therefore encourages the public authorities to be prudent or disciplined in fiscal management. For this strand of literature, the loss of privileges and easy resources would require more rigors in the management of public finances, and therefore a reduction in budget deficits.

2.2. Empirical review

The empirical verification of the effect of financial development on budget deficit comforts the different views of early literature and the inconclusiveness of the true impact of the first on the latter. Almost all empirical works investigate the structural determinants of budget deficits (Gnimassoun & Do Santos, 2021; Maltritz & Wüste, 2015; T. K. Morrison, 1982; Roubini, 1991; Steiner, 2017; Woo, 2003) or seek the influence of an independent central bank (Aisen & Veiga, 2008; Burdekin & Wohar, 1990; Hauner, 2006; Ishaq & Mohsin, 2015; Strong & Yayi, 2021; Tayssir & Feryel, 2018) or test the inverse relation (Hauner, 2006).

Strong & Yayi (2021) reveal that out of 14 studies, 11 found no effect of central bank independence on fiscal balance for both developed and developing countries. These studies (Grilli et al., 1991; Mpofu, 2012; Sikken & De Haan, 1998) contrast with the body of empirical studies (Cukierman et al., 1992; Lucotte, 2009) which shows that there is a statistically significant inverse relationship between central bank autonomy and fiscal deficits. Strong & Yayi (2021) however proceed to a sensitivity analysis with the liquid liabilities as financial development indicator and find that financial development is negatively and significantly associated with fiscal balances for the full sample of 30 CFA-zone and non-CFA zone African countries, but when the relationship is controlled with the effect of currency union membership, financial development has no effect on fiscal balances.

Liquid liabilities and/or other proxies taken from the database of financial development and structure of Beck et al. (2000) are used by the body of empirical literature investigating the structural political economic and institutional determinants of public deficits. Gnimassoun & Do Santos (2021) use the amount of credit extended by banks to the private sector as a percentage of GDP and Woo (2003) uses the the ratio of liquid liabilities of the financial system to GDP to investigate the relationship between financial development and public deficits for 110 and 57 developed and developing countries respectively. Woo (2003) finds that with income inequality, cabinet size among others, financial depth is a significant and robust determinant of public deficits. LLY is associated with larger deficits. Specifically, liquid liabilities negatively affects the budget balance to the extend that a 10% point increase of financial depth is associated with an additional deficit of 0,6%. Gnimassoun & Do Santos (2021) reveal that public deficits are higher in countries with a higher level of debt, a more developed financial sector and better democracy. They also reveal that the exchange rate regime, the level of development and the political system are important determinants of fiscal balance.

Empirical studies use liquid liabilities, central bank independence index and credit extended by banks to the private sector as a percentage of GDP and investigate the effect of financial development on budget deficits for many countries. This study seeks to assess the link for a single country.

3. Data description and empirical strategy
3.1. Variables and data description

The model applied is based on the work of (Gnimassoun & Do Santos, 2021), which studied the robust structural determinants of public deficits in emerging and developing countries, based essentially on a cross-sectional analysis in which the variable to be explained is the average budget balance. The following equation constituted the basis of their empirical analysis:

$$FB = \alpha_\tau + \beta_\tau \vartheta + \gamma_\tau F + \vartheta_\tau E_\tau + \epsilon \tag{1}$$

Where τ is the index of each regression model, F is the set of free (or "consensual") variables that will be included in the regression model (standard explanatory variables), E is a vector of k variables of the set Z of potential determinants (or doubtful variables), and ε is the error term. Equation 1 is estimated for each of the T possible combinations of $E_\tau \subset Z$. FB or fiscal balance is the dependent variable. Based on the above form, we adapted the model for the case of Cameroon; hence the new model is written as follows:

$$FB_t = \alpha + \beta_i F + \gamma_i U + \epsilon \qquad (2)$$

With FB: the budget or fiscal balance of the government, F: the set of variables of financial development (variables of interest); ∪: the other variables that can affect the government deficit and serving as control variables; ∝: the constant of the model; β: the coefficients of the financial development variables; γ: the parameters of the control variables, ε the residuals.

We used the ratio of credit provided to the private sectors by banks to GDP (PRIVY) as a direct indicator and money supply to GDP ratio (LLY) as indirect indicator of financial development in Cameroon. The LLY indicator measures the size of the financial system. It is criticized for the fact that the size of the intermediation does not take into account risk management and information processing. PRIVY testifies to the effectiveness of the banking sector *vis-à-vis* the private sector. King and Levine believe that this variable can also reflect the size of the public sector (Abdala & Fouda, 2015). EXT is the degree of openness (imports + exports). Finally, our final model can be written as follows:

$$FB_t = \alpha + \beta_1 PRIVY_t + \beta_2 LLY_t + \gamma_1 CORRUPT_t + \gamma_2 GOV_t + \gamma_3 GROWTH_t + \gamma_4 INFL_t + \gamma_5 EXT_t + \gamma_6 DEBT_\tau + \epsilon \qquad (3)$$

With CORRUPT and GOV representing respectively corruption control and government effectiveness as indicators of institutional quality; GROWTH is the growth rate of GDP; INFL represents Inflation as measured by annual percentage of consumer price index and DEBT is the total stock of debt.

Data are sourced from the WDI database for all other variables except for institutional quality and dependent variables. Institutional quality indicators data are driven from the Worldwide Governance Indicators and the budget balance data were collected from the Bank of Central African States. Data are gathered for Cameroon and for a 32[5] years span between 1990 and 2021.

3.2. Empirical strategy

We estimate the long-run relationship between fiscal balance and financial development within the ARDL cointegration framework. ARDL technique or bound cointegration technique is useful since time series are not stationary as was conventionally thought and the technique have become the solution to determining the long-run relationship between series that are non-stationary, as well as reparameterizing them to the Error Correction Model (ECM). It is used in determining the long-run relationship between series with different order of integration (Pesaran et al., 2021; Pesaran & Shin, 1999) and the reparameterized result gives the short-run dynamics and long-run relationship of the considered variables.

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[5] The missing values have been completed by the linear interpolation to get the 32 years span.

The ARDL deals with variables that are integrated of different order and is robust when there is a single long-run relationship, but will crash in the presence of second order of integration. The estimation process then starts with the unit root testing to avoid the presence of stochastic trend of I(2). The second step in the estimation process is the cointegration test. With the Autoregressive Distributed Lag (ARDL) approach to cointegration each of the underlying variables stands as a single long-run relationship equation (Nkoro & Uko, 2016). Once the underlying equation is identified, the ARDL model of the cointegrating vector is reparameterized into ECM giving both the short-run dynamics (i.e. traditional ARDL) and long-run relationship of the variables of a single model. The general ARDL($p,q_1,q_2......q_k$) model specification is:

$$\Phi(L)y_t = \varphi + \theta_1(L)x_{1t} + \theta_2(L)x_{2t} + \theta_k(L)x_{kt} + \mu_t \qquad (4)$$

Where x_{it} is the vector of exogenous variables with the fixed lags; L is a lag. As long as it can be assumed that the error term u_t is a white noise process, or more generally, is stationary and independent of x_t, x_{t-1}, … and y_t, y_{t-1}, …, the ARDL models can be estimated consistently by ordinary least squares.

Following (3) and (4), next specifications are thus used to investigate the relationship between financial development and fiscal balance:

$$\Delta FB_t = \beta_0 + \sum_{i=1}^{j} \beta_{1i} \Delta FB_{t-i} + \sum_{i=0}^{k} \beta_{2i} \Delta PRIVY_{t-i} + \sum_{i=0}^{l} \beta_{3i} \Delta LLY_{t-i} + \sum_{i=0}^{m} \beta_{4i} \Delta CORRUPT_{t-i} + \sum_{i=0}^{n} \beta_{5i} \Delta GOV_{t-i} + \sum_{i=0}^{o} \beta_{6i} \Delta GROWTH_{t-i} + \sum_{i=0}^{p} \beta_{7i} \Delta INFL_{t-i} + \sum_{i=0}^{q} \beta_{8i} \Delta EXT_{t-i} + \sum_{i=0}^{q} \beta_{9i} \Delta DEBT_{t-i} + \alpha_1 FB_{t-1} + \alpha_2 PRIVY_{t-1} + \alpha_3 LLY_{t-1} + \alpha_4 CORRUPT_{t-1} + \alpha_5 GOV_{t-1} + \alpha_6 GROWTH_{t-1} + \alpha_7 INFL_{t-1} + \alpha_8 EXT_{t-1} + \alpha_9 DEBT_{t-1} + \epsilon_t \qquad (5)$$

$$\Delta FB_t = \beta_0 + \sum_{i=1}^{j} \beta_{1i} \Delta FB_{t-i} + \sum_{i=0}^{k} \beta_{2i} \Delta PRIVY_{t-i} + \sum_{i=0}^{l} \beta_{3i} \Delta LLY_{t-i} + \sum_{i=0}^{m} \beta_{4i} \Delta CORRUPT_{t-i} + \sum_{i=0}^{n} \beta_{5i} \Delta GOV_{t-i} + \sum_{i=0}^{o} \beta_{6i} \Delta GROWTH_{t-i} + \sum_{i=0}^{p} \beta_{7i} \Delta INFL_{t-i} + \sum_{i=0}^{q} \beta_{8i} \Delta EXT_{t-i} + \sum_{i=0}^{q} \beta_{9i} \Delta DEBT_{t-i} + \delta ECT_{t-i} + \epsilon_t \qquad (6)$$

In Equation (5), Δ denotes the difference operator; β_0 is the constant term and, ε_t denotes the random error term. β_1… β_9 and α_1… α_9 represent the regression coefficients. Equation (6) is the error correction model, where β_1… β_9 are the short term coefficients and δ is the coefficient of the error-correction term (ECT).

4. Results and discussion

We began by examining the trend of the variables under study. Before analyzing the long term relation between financial development and fiscal deficits, and the stability of the relation, we present the descriptive statistics, the correlation analysis and the unit roots results.

4.1. Descriptive analysis

Descriptive statistics (table 1) show a structural negative balance of the government budget during the 32 years span in Cameroon with an average rate of -3.32% of GDP. The budget recorded a highest deficit of 5.35% of GDP and never reached equilibrium. The domestic credit provided to the private sectors by the bank in Cameroon is between 5.53% and 26.42% of GDP. The highest percentage of the money supply recorded during the study period was 21.63% and the lowest was 10.27%. GDP growth has been low too with an average of 2.79%.

Table 1: Descriptive statistics

	FB	PRIVY	LLY	CORRUPT	GOV	GROWTH	INFL	LNEXT	LNDEBT
Mean	-3.315898	11.18353	16.38251	-1.098856	-0.875382	2.794865	3.278241	21.88550	22.73234
Median	-3.670977	9.426798	16.52223	-1.064271	-0.910534	3.821001	2.165472	21.98943	22.87422
Maximum	-1.593337	26.41866	21.62894	-1.003626	-0.763864	7.048863	35.09446	22.60594	23.49606
Minimum	-5.354400	5.528167	10.27386	-1.261325	-0.949396	-7.932067	-3.206555	21.09770	21.76550
Std. Dev.	0.811931	4.974390	3.659821	0.065488	0.053615	3.399485	6.179421	0.508713	0.513434
Skewness	0.077573	1.697297	-0.077459	-0.890345	0.721663	-1.873188	4.435890	-0.064511	-0.664273
Kurtosis	2.890485	6.073963	1.560408	2.632243	1.941466	5.806822	23.48066	1.367749	2.171345
Jarque-Bera	0.048085	27.96335	2.795232	4.408138	4.271582	29.21810	664.2215	3.574520	3.268940
Probability	0.976244	0.000001	0.247186	0.110353	0.118151	0.000000	0.000000	0.167418	0.195056
Sum	-106.1087	357.8731	524.2402	-35.16340	-28.01223	89.43567	104.9037	700.3361	727.4349
Sum Sq. Dev.	20.43617	767.0813	415.2229	0.132948	0.089111	358.2514	1183.742	8.022449	8.172033
Observations	32	32	32	32	32	32	32	32	32

Source: Authors' computation

Just like growth, institutional quality indicators feature poor records. Control of corruption has an average of -1.099 and government efficiency an average of -0.875.

A close look at the pairwise correlation result presented below (table 2 and figure 2) shows a preview of the relationship between all the variables used in the study. It can be noted that there is a presumption of negative relationship between the fiscal deficits and financial development in Cameroon over the period as the correlation between PRIVY and LLY on one side and FB on the other side are positive.

Table 2: Correlation matrix

	FB	PRIVY	LLY	CORRUPT	GOV	GROWTH	INFL	LNEXT	LNDEBT
FB	1.000000								
PRIVY	0.028297	1.000000							
LLY	0.272194	0.828785	1.000000						
CORRUPT	-0.154843	-0.325190	-0.549455	1.000000					
GOV	0.175219	0.284554	0.613271	-0.371470	1.000000				
GROWTH	0.191455	-0.480193	-0.196505	-0.187057	0.204124	1.000000			
INFL	-0.047527	-0.238791	-0.211969	0.119653	-0.145875	0.095011	1.000000		
LNEXT	0.573711	0.259128	0.645066	-0.580842	0.696308	0.378878	-0.255805	1.000000	
LNDEBT	-0.616907	-0.069600	-0.150907	-0.175849	0.001377	0.045125	0.057046	-0.414003	1.000000

Source: Authors' computation

Figure 2: Correlation between financial development and deficit
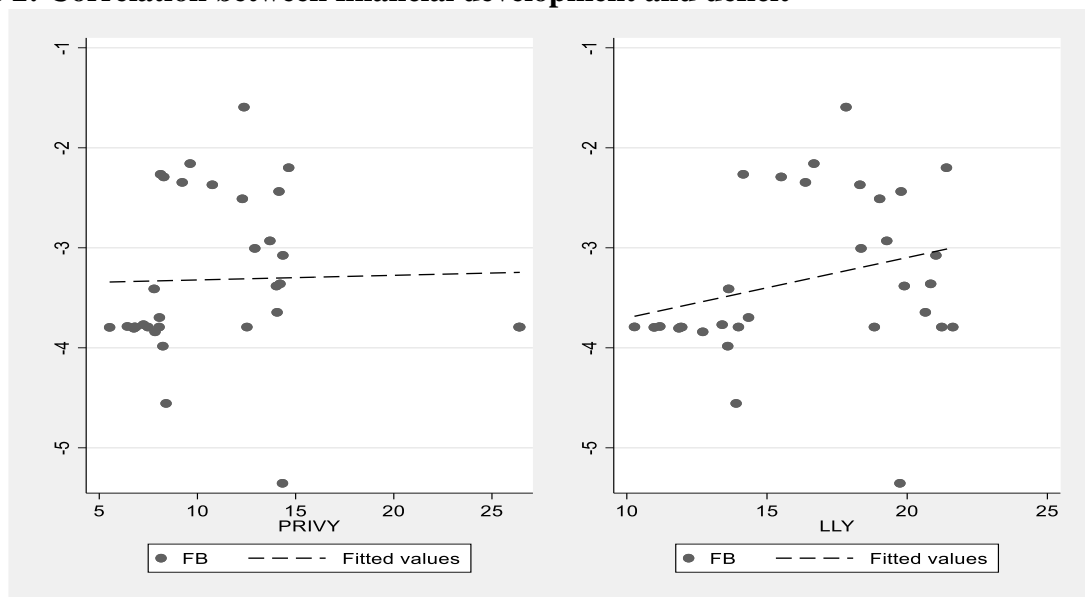
Source: Authors' construction

This negative relationship implies that financial development reduces fiscal deficits and improves fiscal balance. There seems also to be a negative relationship between fiscal balance on one hand and corruption, inflation and the stock of debt on the other hand. GDP growth and trade openness are good for fiscal balance. The test for levels of cointegration is essential for the selection of the appropriate method to assess the relationship between financial development and the budget deficit in Cameroon.

4.2. Unit root analysis and long term cointegration test

Although not compulsory, the unit root test is helpful to avoid crash of ARDL; the study had to ascertain there was no second order integration. The study examined stationary levels of variables using Augmented Dickey Fuller and Phillip Perron tests. Both examinations reported same mixed stationary levels, but ADF's result was preferred and is therefore presented in table 3 below. On one hand, the dependent variable is stationary at level as well as the main variable of interest and some of the control variables such as GDP growth, and Inflation. On the other hand, liquid liabilities, corruption control, government efficiency, trade openness and stock of debt are stationary at first difference. The superiority of ARDL over ordinary least squares lies in its flexibility in dealing with the cointegration variables with mixed levels of difference. In addition, it provides unbiased estimates of the long-run model, even in cases where some variables are endogenous.

Table 3: Stationarity and order of integration of the series

Variables	Level		1st difference		Decision
	t-Stat	Prob	t-stat	Prob	
FB	-3.777	0.0032	-	-	I(0)
PRIVY	-3.544	0.0069	-	-	I(0)
LLY	-1.352	0.6050	-5.197	0.000	I(1)
CORRUPT	-1.618	0.4738	-5.340	0.000	I(1)
GOV	-1.820	0.3704	-6.228	0.000	I(0)
Inflation	-5.196	0.000	-	-	I(0)
LnExt	-0.608	0.8692	-4.824	0.000	I(1)
LnDebt	-0.563	0.8791	-3.045	0.0309	I(1)

Source: Authors' computation

The decision criterion for long-term cointegration is the comparison of the F-statistic value and the critical values of the lower and upper values. The null hypothesis of no long-term cointegration is rejected if the F-statistic value is greater than the critical value at the upper bound. If the F-statistic falls below the critical value at the lower bound, then the null hypothesis of no long-term relationship is accepted, but if it falls within the two critical limits, then the result is inconclusive.

Table 4: ARDL Long-Term Cointegration bound test

Test Statistic	Value	k
F-statistic	8.094539	8

Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	1.95	3.06
5%	2.22	3.39
2.5%	2.48	3.7
1%	2.79	4.1

Source: Authors' computation

It can be seen that F-statistic is 8.094539 and higher than the critical values of the upper limit at significance levels of 1%, 2.5%, 5% and 10%. This indicates that there is a long-term relationship between budget balance and the regressors[6].

4.3. Impact analysis of the relationship between financial development and fiscal balance

After confirming the long-run relationship, the model was estimated to determine automatically the optimal lag length. The optimal lag length selected using the Akaike info criterion (AIC) is ARDL (1, 2, 1, 2, 1, 2, 1, 2, 0)[7].

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[6] The bound test presented here is for the main model using both PRIVY and LLY. The results are similar when these indicators are used separately. See Appendix for details.

[7] The optimal lag length for the model with PRIVY is ARDL(1, 2, 1, 1, 2, 1, 2, 1). The optimal lag length for the model with LLY alone is ARDL(1, 1, 0, 0, 1, 1, 2, 1).

Table 5: ARDL lag length selection model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FB(-1)	-0.481703	0.183032	-2.631799	0.0273
PRIVY	0.208138	0.296685	0.701546	0.5007
PRIVY(-1)	-0.193863	0.075081	-2.582035	0.0296
PRIVY(-2)	-0.165727	0.106655	-1.553861	0.1546
LLY	0.297086	0.155808	1.906748	0.0889
LLY(-1)	-0.243811	0.227376	-1.072282	0.3115
CORRUPT	1.207932	2.754523	0.438527	0.6713
CORRUPT(-1)	-4.854178	4.487315	-1.081756	0.3075
CORRUPT(-2)	-4.959778	3.295292	-1.505110	0.1666
GOV	-5.470499	4.056484	-1.348581	0.2104
GOV(-1)	8.976413	4.503068	1.993400	0.0774
GROWTH	0.046366	0.076138	0.608970	0.5576
GROWTH(-1)	-0.291177	0.086090	-3.382252	0.0081
GROWTH(-2)	-0.343906	0.128662	-2.672944	0.0255
INFL	-0.160109	0.037713	-4.245487	0.0022
INFL(-1)	-0.075058	0.042440	-1.768554	0.1108
LNEXT	-0.817818	0.733003	-1.115709	0.2934
LNEXT(-1)	3.858583	1.220747	3.160838	0.0115
LNEXT(-2)	-2.919598	0.992170	-2.942638	0.0164
LNDEBT	-1.144486	0.547920	-2.088783	0.0663
C	15.57013	35.53425	0.438173	0.6716

R-squared	0.934646	Mean dependent var	-3.284135	
Adjusted R-squared	0.789415	S.D. dependent var	0.829456	
S.E. of regression	0.380633	Akaike info criterion	1.102068	
Sum squared resid	1.303937	Schwarz criterion	2.082906	
Log likelihood	4.468986	Hannan-Quinn criter.	1.415846	
F-statistic	6.435580	Durbin-Watson stat	3.050381	
Prob(F-statistic)	0.003472			

*Note: p-values and any subsequent tests do not account for model
selection.

Source: Authors' computation

Table (6) presents the short-run and the long term form of the cointegration model. The model is a perfect fit as its explanatory power R^2 is 93%.

Table 6: Short-run and long-run coefficients

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PRIVY)	0.208138	0.296685	0.701546	0.5007
D(PRIVY(-1))	0.165727	0.106655	1.553861	0.1546
D(LLY)	0.297086	0.155808	1.906748	0.0889
D(CORRUPT)	1.207932	2.754523	0.438527	0.6713
D(CORRUPT(-1))	4.959778	3.295292	1.505110	0.1666
D(GOV)	-5.470499	4.056484	-1.348581	0.2104
D(GROWTH)	0.046366	0.076138	0.608970	0.5576
D(GROWTH(-1))	0.343906	0.128662	2.672944	0.0255
D(INFL)	-0.160109	0.037713	-4.245487	0.0022
D(LNEXT)	-0.817818	0.733003	-1.115709	0.2934
D(LNEXT(-1))	2.919598	0.992170	2.942638	0.0164
D(LNDEBT)	-1.144486	0.547920	-2.088783	0.0663
CointEq(-1)	-1.481703	0.183032	-8.095334	0.0000

Cointeq = FB - (-0.1022*PRIVY + 0.0360*LLY -5.8082*CORRUPT + 2.3661
*GOV -0.3973*GROWTH -0.1587*INFL + 0.0818*LNEXT -0.7724
*LNDEBT + 10.5083)

Long-run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIVY	-0.102215	0.191929	-0.532565	0.6072
LLY	0.035955	0.170294	0.211138	0.8375
CORRUPT	-5.808199	3.983523	-1.458056	0.1788
GOV	2.366139	3.915849	0.604247	0.5606
GROWTH	-0.397325	0.105958	-3.749844	0.0046
INFL	-0.158714	0.037261	-4.259508	0.0021
LNEXT	0.081776	0.801070	0.102083	0.9209
LNDEBT	-0.772413	0.385421	-2.004078	0.0761
C	10.508272	24.420351	0.430308	0.6771

Source: Authors' computation

The empirical results presented in table 6 show that in the long-run financial development measured by PRIVY or LLY is not significant, but LLY is positive and statistically significant at 10% level of significance in the short-run. The results suggest that financial development in Cameroon improves fiscal balance and so reduces the budget deficits only in the short-run[8]. Although the sign is not the expected one, the short-run impact of financial development of fiscal balance and the absence of statistically significant relationship in the long-run is consistent with Abdala & Fouda (2015), Strong & Yayi (2021). For Steiner (2017) and Woo (2003), developed financial markets help governments to easily cover deficits and become less

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[8] The models using the financial indicators solely show quite similar results as presented in Appendix.

dependent on inflationary financing and then, countries with developed financial markets are characterized by lower budget balance. Strong & Yayi (2021) show that financial development is negatively and significantly associated with fiscal balances. But when controlled with currency union membership, financial development has no effect on fiscal balances. A currency union membership provides other commitment devices that lessen the need for debt monetization, eliminating the role played by financial development in improving fiscal discipline. Abdala & Fouda (2015) suggest that the budget balances of central African countries with low financial development are strongly linked to the financial system unlike the countries with high level of financial development. The sign of the coefficient thus opposes the strand of literature which suggests that improvements in the financial system harm the state finances and is rather in line with the strand of literature which support that financial development improves fiscal discipline and is good for fiscal balance.

Short-run results for other variables show that: i) past growth has a positive impact on fiscal balance and reduces budget deficits; ii) inflation harms public finances and increases deficits; iii) past trade openness positively impact fiscal balance; iv) and debt is harmful to state finances and increases deficits; v) the lag cointegration coefficient is -1.48 and significant at 1% level implying that adjustment to equilibrium following a shock to the economy is totally anticipated before the end of the year; vi) institutional quality indicators are not significant in the short-run.

Other long-run results confirm that: i) GDP growth is significant at 1% level and negatively affects fiscal balance; long term growth thus increases budget deficits; ii) inflation is significant at 1% level of significance and also harms fiscal balance; iii) the stock of debt is negative and significant at 10% level; iv) financial development variables, institutional quality variables and trade openness are not significant.

Growth is a key variable that affects budget deficits. The study shows that growth affects fiscal balance positively in the short-run but negatively in the long-run. The short-run result is in line with theoretical and empirical studies confirming that automatic stabilizer should help budget balance to deteriorate during recession and improve during expansion (Morrison, 1982; Steiner, 2017; Woo, 2003). But the result opposes this literature in the long-run. This could mean that Cameroon, as low income countries, has consistently struggled to mobilize public revenue to face increasing pressure from health, education or infrastructure public spendings.

Stock of debt is also relevant for public finance. The result show that debt negatively impacts fiscal balance in the short and in the long-run. This result is consistent with general literature (Gnimassoun & Do Santos, 2021; Woo, 2003)ascertaining that debt and its service jeopardize public finances and enlarge budget deficits. The debt servicing and stock have not yet achieved to foster the quest for budgetary excesses.

Inflation is also important for public deficits. Inflation affect fiscal deficits through various channels. Rapidly rising inflation can raise fiscal deficits through higher nominal interest payments or lower real tax revenues (Kontopoulos & Perotti, 1999; Woo, 2003).

5. Conclusion and policy implication

This study aimed at investigating the relevance of financial development in explaining budget deficits in Cameroon. Two strand of literature oppose on the impact of financial development on fiscal balance. For the first body of literature, high levels of financial development may command more rigors from the government towards better management of public finances and

lead to fiscal excesses. For the other body of literature, high levels of financial development lead to lower fiscal balance as the deficits are covered easily through bonds. Budget deficits are thus higher either after the liberalization because of high interest rates payments or with financial development because they are easily covered. Empirical literature uses central bank independence, credit to private sector by banks and liquid liabilities as proxies of financial development, admits for the majority that financial development negatively impacts fiscal balance (Cukierman et al., 1992; Gnimassoun & Do Santos, 2021; Lucotte, 2009; Woo, 2003), but the relationship is not always conclusive (Grilli et al., 1991; Mpofu, 2012; Sikken & De Haan, 1998; Strong & Yayi, 2021). These studies investigated the effect of financial development on budget deficits for many countries. Our study focussed on a single country, Cameroon, used both PRIVY and LLY as financial development indicators (together and seperately) and applied the ARDL cointegration technique over the 1990-2021 period.

Our results show that in the long-run, financial development has no impact on fiscal balance. Together or used seperately in different models, the financial indicators are not significant. In the short-run, financial depth and past values of credit provided by banks to private sector are positive and significant at 5% and 1% respectively when used seperately. Financial depth is positive and significant alone at 10% when used together with PRIVY. It can be concluded that for a single country, budget balance can be sensitive to financial development at least in the short-run and a positive impact is found. In Cameroon, financial development encourages budget discipline, improves fiscal balance and thus reduces budget deficits. The results recommend Cameroon's authorities to enhance financial development to improve strong management of public finances and rationalization of expenses.

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7. Appendix
A1: Results of the model using PRIVY solely
Table 7: ARDL lag length selection
Dependent Variable: FB
Method: ARDL
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): PRIVY CORRUPT GOV GROWTH
        INFL LNEXT LNDEBT
Fixed regressors: C
Number of models evalulated: 2187
Selected Model: ARDL(1, 2, 1, 1, 2, 1, 2, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FB(-1)	-0.453731	0.177630	-2.554360	0.0268
PRIVY	0.232309	0.153614	1.512288	0.1586
PRIVY(-1)	-0.137989	0.075378	-1.830631	0.0944
PRIVY(-2)	-0.277424	0.083713	-3.313979	0.0069
CORRUPT	3.069742	2.809556	1.092608	0.2979
CORRUPT(-1)	-10.34650	4.096521	-2.525679	0.0282
GOV	-0.720160	4.050018	-0.177817	0.8621
GOV(-1)	8.676546	4.981852	1.741631	0.1094
GROWTH	0.103927	0.086404	1.202802	0.2543
GROWTH(-1)	-0.269783	0.080087	-3.368607	0.0063
GROWTH(-2)	-0.449094	0.171691	-2.615720	0.0240
INFL	-0.147918	0.037302	-3.965436	0.0022
INFL(-1)	-0.120667	0.048693	-2.478096	0.0307
LNEXT	-1.058178	0.922193	-1.147458	0.2755
LNEXT(-1)	3.146970	1.064537	2.956187	0.0131
LNEXT(-2)	-1.576361	0.768849	-2.050288	0.0649
LNDEBT	-2.058289	1.167412	-1.763122	0.1056
LNDEBT(-1)	1.082244	0.984352	1.099448	0.2951
C	10.06785	35.64099	0.282479	0.7828

R-squared	0.904892	Mean dependent var	-3.284135
Adjusted R-squared	0.749261	S.D. dependent var	0.829456
S.E. of regression	0.415341	Akaike info criterion	1.343930
Sum squared resid	1.897587	Schwarz criterion	2.231355
Log likelihood	-1.158943	Hannan-Quinn criter.	1.627824
F-statistic	5.814330	Durbin-Watson stat	3.004776
Prob(F-statistic)	0.002453		

*Note: p-values and any subsequent tests do not account for model
   selection.

Table 8: Bound test
ARDL Bounds Test
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	11.24174	7

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

Table 9: Long-run and short-run cointegration
ARDL Cointegrating And Long Run Form
Dependent Variable: FB
Selected Model: ARDL(1, 2, 1, 1, 2, 1, 2, 1)
Date: 08/10/23   Time: 05:14
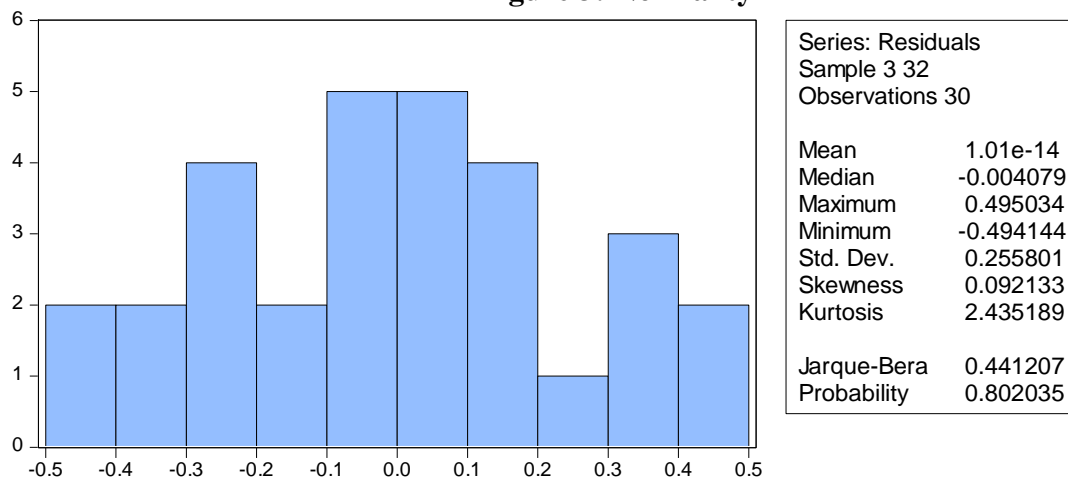Sample: 1 32
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PRIVY)	0.232309	0.153614	1.512288	0.1586
D(PRIVY(-1))	0.277424	0.083713	3.313979	0.0069
D(CORRUPT)	3.069742	2.809556	1.092608	0.2979
D(GOV)	-0.720160	4.050018	-0.177817	0.8621
D(GROWTH)	0.103927	0.086404	1.202802	0.2543
D(GROWTH(-1))	0.449094	0.171691	2.615720	0.0240
D(INFL)	-0.147918	0.037302	-3.965436	0.0022
D(LNEXT)	-1.058178	0.922193	-1.147458	0.2755
D(LNEXT(-1))	1.576361	0.768849	2.050288	0.0649
D(LNDEBT)	-2.058289	1.167412	-1.763122	0.1056
CointEq(-1)	-1.453731	0.177630	-8.184034	0.0000

Cointeq = FB - (-0.1260*PRIVY -5.0056*CORRUPT + 5.4731*GOV -0.4230
*GROWTH -0.1848*INFL + 0.3525*LNEXT - 0.6714*LNDEBT + 6.9255)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIVY	-0.125954	0.086965	-1.448324	0.1754
CORRUPT	-5.005571	3.853001	-1.299136	0.2205
GOV	5.473079	5.120436	1.068870	0.3080
GROWTH	-0.423015	0.096190	-4.397693	0.0011
INFL	-0.184755	0.053402	-3.459736	0.0053
LNEXT	0.352494	0.752882	0.468193	0.6488
LNDEBT	-0.671407	0.368041	-1.824271	0.0954
C	6.925520	24.897643	0.278160	0.7860

Figure 3: Normality

Series: Residuals	
Sample 3 32	
Observations 30	
Mean	1.01e-14
Median	-0.004079
Maximum	0.495034
Minimum	-0.494144
Std. Dev.	0.255801
Skewness	0.092133
Kurtosis	2.435189
Jarque-Bera	0.441207
Probability	0.802035

A2: Results of the model using LLY solely
Table 10: ARDL lag length selection
Dependent Variable: FB
Method: ARDL
Date: 08/10/23   Time: 05:17
Sample (adjusted): 3 32
Included observations: 30 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): LLY CORRUPT GOV
GROWTH
    INFL LNEXT LNDEBT
Fixed regressors: C
Number of models evaluated: 2187
Selected Model: ARDL(1, 1, 0, 0, 1, 1, 2, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FB(-1)	-0.295250	0.172578	-1.710822	0.1077
LLY	0.276107	0.122295	2.257714	0.0393
LLY(-1)	-0.359080	0.132038	-2.719514	0.0158
CORRUPT	0.923888	3.138018	0.294418	0.7725
GOV	-4.838249	4.144527	-1.167383	0.2613
GROWTH	0.003226	0.073628	0.043815	0.9656
GROWTH(-1)	-0.278613	0.088451	-3.149906	0.0066
INFL	-0.081549	0.034158	-2.387411	0.0306
INFL(-1)	0.034996	0.017595	1.988970	0.0653
LNEXT	0.516924	0.904628	0.571422	0.5762
LNEXT(-1)	3.746508	1.070507	3.499752	0.0032
LNEXT(-2)	-2.330274	0.845499	-2.756094	0.0147
LNDEBT	0.614199	0.778108	0.789350	0.4422
LNDEBT(-1)	-0.918394	0.702231	-1.307822	0.2106
C	-40.59554	26.14513	-1.552700	0.1413

R-squared	0.820960	Mean dependent var		-3.284135
Adjusted R-squared	0.653857	S.D. dependent var		0.829456
S.E. of regression	0.488002	Akaike info criterion		1.709857
Sum squared resid	3.572183	Schwarz criterion		2.410455
Log likelihood	-10.64785	Hannan-Quinn criter.		1.933984
F-statistic	4.912880	Durbin-Watson stat		2.511402
Prob(F-statistic)	0.002048			

*Note: p-values and any subsequent tests do not account for model
    selection.

Table 11: Bound test

ARDL Bounds Test
Date: 08/10/23   Time: 05:21
Sample: 3 32
Included observations: 30

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	9.414164	7

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

Table 12: Long-run and short-run cointegration
ARDL Cointegrating And Long Run Form
Dependent Variable: FB
Selected Model: ARDL(1, 1, 0, 0, 1, 1, 2, 1)
Date: 08/10/23   Time: 05:22
Sample: 1 32
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LLY)	0.276107	0.122295	2.257714	0.0393
D(CORRUPT)	0.923888	3.138018	0.294418	0.7725
D(GOV)	-4.838249	4.144527	-1.167383	0.2613
D(GROWTH)	0.003226	0.073628	0.043815	0.9656
D(INFL)	-0.081549	0.034158	-2.387411	0.0306
D(LNEXT)	0.516924	0.904628	0.571422	0.5762
D(LNEXT(-1))	2.330274	0.845499	2.756094	0.0147
D(LNDEBT)	0.614199	0.778108	0.789350	0.4422
CointEq(-1)	-1.295250	0.172578	-7.505303	0.0000

Cointeq = FB - (-0.0641*LLY + 0.7133*CORRUPT - 3.7354*GOV -0.2126
*GROWTH -0.0359*INFL + 1.4925*LNEXT - 0.2349*LNDEBT -31.3418)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLY	-0.064060	0.068589	-0.933968	0.3651
CORRUPT	0.713289	2.398386	0.297404	0.7702
GOV	-3.735378	3.134462	-1.191713	0.2519
GROWTH	-0.212613	0.076663	-2.773332	0.0142
INFL	-0.035942	0.026908	-1.335742	0.2015
LNEXT	1.492497	0.648620	2.301035	0.0362
LNDEBT	-0.234854	0.283801	-0.827530	0.4209
C	-31.341847	19.546456	-1.603454	0.1297

Figure 4: Normality

Series: Residuals	
Sample 3 32	
Observations 30	
Mean	7.11e-15
Median	-0.022053
Maximum	0.742118
Minimum	-0.704789
Std. Dev.	0.350968
Skewness	0.213542
Kurtosis	2.754928
Jarque-Bera	0.303077
Probability	0.859385