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External DEBT And Capital Flight In Cameroon: Bounds Testing Approach

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ABSTRACT
This paper analyses the relationship between external debt and capital flight in Cameroon for the period 1970-2010. Based on the limits of the approach of Johansen cointegration, we use the autoregressive Distributed lag (ARDL) methodology of cointegration of Pesaran and al. (2001) to determine the relationship between external debt and capital flight. The data used come from the Autonomous Sinking Fund of Cameroon, World Development Indicator of the World Bank and the base of Boyce and Ndikumana (2012). Our results show that in the short term, the rise of a dollar in external debt leads to an increase of 54 cents of capital flight; a situation which gradually decreases over time. Moreover, the capital flight of Cameroon is caused by official development assistance, trade openness and the rent from natural resources, particularly oil rents.

KEYWORDS: Cameroon; capital flight; Bounds testing approach; external debt

Introduction

External debt is an important concern to African countries. In the 1990s, for instance, Senegal, Gabon and Cameroun became vulnerable to debt-related crises, and experienced large-scale capital flight, especially in the late 1990s. But recent evidence shows that capital flight had already been significant in the region earlier on, even during the 1980s (Bendoma, 2010).

Since the late 1970s, the impact of capital flight on economic growth has gone through deep theoretical and empirical investigation. As a result, in the early 1990s, the financial revolving door hypothesis emerged. This hypothesis refers to a bi-directional flow of capital, i.e. where capital enters the country in the guise of external borrowing and simultaneously slips out of the country as private capital flight. The analogy to a revolving door is evident. It justifies the fact that external debt can directly and indirectly affects capital flight and conversely. Thus, in order to alleviate the phenomenon of capital flight and its adverse impacts in Cameroun, it is necessary to study the relationship between different economic aggregates and external debt there.

In this way, policy makers can put strategies for stimulating economic growth and better manage external debt. So, by applying the bounds testing approach, this paper tests the financial revolving door hypothesis between external debt and capital flight for Cameroon over the period (1984-2010). Thus, the long and short-run impacts of external debt, GDP growth rate, foreign trade, and corruption on capital flight are measured. Furthermore, to what extent the Financial Revolving Door hypothesis is relevant to the Cameroonian economy is being tested.

The remainder of this paper is organized as follows. Section 2 reviews the literature on the relationship between external debt and capital flight. Section 3 illustrates the link between external debt, capital flight and some main institutional variables in Cameroun. Section 4 demonstrates the methodology and data sources while section 5 presents the diagnostic tests used. Section 6 reports the empirical results. Finally, section 7 provides the conclusion.

1. Literature Review

A survey of the literature suggests that the coexistence of capital flight and external debt in a country is theoretically plausible. This section provides a brief discussion of the hypothesized linkages between the two variables.

Typology of the determinants of capital flight and external borrowing

Indirect linkages	Direction of linkages: (A) Exogenous variables External debt Capital flight		
	Direction of linkages:	(B1) External debt to capital flight	(B2) Capital flight to external debt
Direct linkages	(1) Means	Debt-fueled flight	Flight-fueled debt
	(2) Motive	Debt-driven flight	Flight-driven debt

Note: Table adapted from Boyce (1992).

Indirect linkages

One class of explanations posits only an indirect linkage between capital flight and external debt, with the contention that some overlapping sets of exogenous factors cause both capital flight and external borrowing. Capital flight occurs not because of capital inflows or external debt per se, but rather because of, say, macroeconomic mismanagement. In similar fashion, developing countries are (now highly) indebted not because of capital flight but, again, because of macroeconomic mismanagement. Policy mistakes, corruption, rent-seeking behaviour, weak domestic institutions, and the like, will induce capital flight and cause external debt problems. Another contention is that capital inflows (especially during surges of capital flows) lead to risky or unsound investment decisions and over-borrowing. When governance structures and mechanisms for administrative controls and prudential regulation are weak, fragile or missing, money borrowed from abroad can end up being pocketed by the domestic elite (and usually transferred into private accounts abroad), spent on conspicuous consumption, or allocated into showcase and unproductive development projects that do not generate foreign exchange to finance external debt servicing. So capital flight and external borrowing are manifestations and responses to unfavourable domestic economic conditions.

We can extend the above explanation to include new dimensions among the indirect linkages between capital flight and external debt, arising from recent developments in international finance and the global economy. Specifically, we consider the impact of deregulation and financial liberalization on capital flight. In conventional wisdom, when a country adopts economic reforms, the expectation is that there will be no more capital flight. Accordingly, foreign savings will be made available to domestic entrepreneurs who in turn will use the cheap funds to build businesses, and create jobs and other infrastructure in the country.

But such an outcome is only possible when economic reforms are pursued with complementary governance structures and administrative capacity. When these structures are weak, fragile or missing, deregulation and financial liberalization will induce capital flight. Thus deregulation and financial liberalization have not only enabled developing countries to have greater access to external capital, but have also led these countries (and firms) to take risky and unsound investment decisions and over-borrow. Such action can be mediated by asymmetric risk problems that favour international finance / investment over domestic finance / investment, especially with regard to the expropriation of capital and taxation. But the consequent economic and financial crises have only induced more capital flight and greater external borrowing.

Furthermore, deregulation and financial liberalization in developed countries have unleashed large amounts of capital seeking new investment areas with attractive returns. The consequent increase in competition in the capital markets and the tendency towards short-term and rapid investments have created an economic environment prone to financial swings, crises, contagions, and economic stagnation. While it may be true that some developing countries have benefited from increased capital inflows (i.e., availability of external savings), they have also found it more difficult to manage their economies, as capital comes in and leaves rather quickly. In the end, we find that developing countries experience frequent and severe financial and economic crises, as demonstrated in the 1990s. In turn, we argue that capital flight has increased during the period of deregulation and financial liberalization. Thus we hypothesize that: *deregulation and financial liberalization increase capital flight and external borrowing*.

The discussion above implies that there is a supply-and-demand dimension underlying the indirect linkages to capital flows or external debt, and by extension, there is also a supply-and-demand dimension to capital flight and external borrowing. Tis situation suggests that the effective management of both demand and supply of capital is needed to reduce capital flight. We argue that in a context where the institutions of governance and administrative capacity are weak, fragile, or missing, deregulation and financial liberalization will result in greater economic vulnerability and intense financial and economic crises, while governments become ineffective, or unable to respond. In fact, McKinnon (1991) presciently warned that embarking on premature deregulation and rapid financial liberalization of capital flows will result in unwarranted capital flight or unwarranted indebtedness, or both.

The indirect linkages to capital flight would therefore be stronger in the presence of weak, fragile or missing governance structures and administrative capacity. Capital flight occurs because the prevailing conditions allow it. In this framework, sound institutions and the pursuit of reforms in the proper manner, will reduce economic risk, sustain economic growth, and reduce capital flight.

While the indirect linkages may help explain a cross-sectional correlation between capital flight and external borrowing, it remains to be explained why there is often a close year-to-year correlation between capital flight and external debt and why, in some cases, capital flight tends to be persistent. The tight correlation between the current flows suggests a direct linkage between these variables. The correlation between current and past capital flight, and between current and past borrowing, suggests persistence or hysteresis.

Direct linkages

Table 2 (above) shows the direct linkages between capital flight and external debt. As shown in the table, there are two directions of direct linkages. In the first, external debt provides the fuel or is the driver of capital flight; that is, capital inflow has a "liquidity" (or fuel) effect, while its accumulation has a "stock" (or driver) effect. The reverse link posits that capital flight creates the fuel or is the driver of borrowing; that is, capital flight (again) has a short-run "liquidity" effect but, as it persists, also has a "stock" effect.

External debt linked to capital flight

The argument that external debt fuels capital flight acknowledges the fact that loan proceeds can be "transformed" from capital inflow to capital flight. In this case, external debt provides the resources or funds for capital flight. Such funds could create conditions for capture as "loot" that individuals (often the elite) appropriate as their own. In fact, the (captured) funds may not even enter the country at all. Instead only accounting entries are done in the respective accounts of financial institutions.

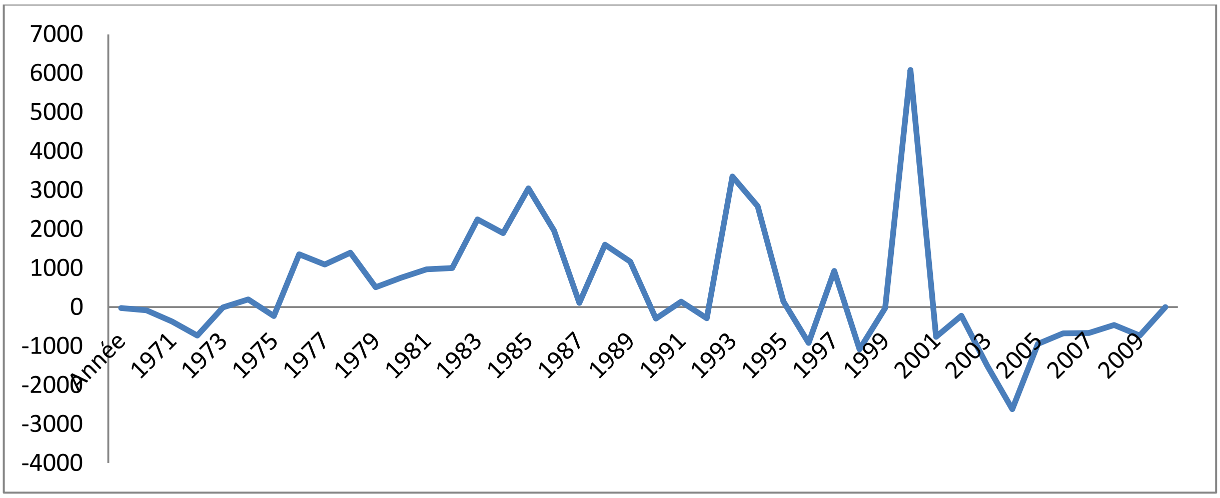
Capital flight linked to external debt

The second direction of linkages is flight-fueled borrowing and flight-driven borrowing. Flight-fueled borrowing takes place when capital is pulled out from a country and then re-enters the same country in the form of external debt or foreign investment. In this case, domestic capital is first converted into dollars, for example, and then deposited overseas; the depositor then takes a 'loan' from the same bank. In effect, this process conceals the source of the funds. It transforms capital that may have been acquired through inappropriate or dubious ways, into something legitimate. Also, flight-fueled borrowing serves as a pretext for otherwise unexplained or "hidden" wealth. One crucial dimension of this process is that flight-fueled borrowing sheds the national character of the capital; that is, domestic capital re-emerges as foreign capital. Freed of domestic social controls, it is able to enjoy the privileges extended to foreign capital. Thus we hypothesize that: *an increase in capital flight increases external borrowing.*

2. A Brief Overview of the Cameroonian Experience

Cameroon is classified among the countries of the Franc Zone which record the largest volumes of capital flight. Indeed, the results of Boyce and Ndikumana (2012) over the period 1970-2010 reveal that three countries of the Franc Zone are in the top ten countries of Sub-Saharan Africa recording the highest capital flight: 3rd place for Côte d'Ivoire ($ 56 billion or 244.4% of 2010 GDP); 7th Gabon ($ 25.5 billion or 192.9% of GDP in 2010); 10th place for Cameroon ($ 20 billion or 89% of 2010 GDP).

Figure (1): Evolution of capital flight from Cameroon



Source :Boyce and Ndikumana (2012) and construction of the author.

By observing the previous graph, the observation that emerges is that the evolution of capital flight from Cameroon over the period 1970 to 2010 is characterized by alternating periods of sharp increases and decreases. Recording negative leaks in the early 1970s, the first peak appeared in 1977 (with a value of $ 1359.7 million). This year corresponds to the date of discovery and the beginning of oil exploitation in Cameroon. The second peak is observed in 1984 (with an amount of 2253.9 million dollars) marked by an attempted coup in Cameroon. During the next two years, we also observe high values of capital flight in Cameroon. These two years (1985-86) correspond to the end of the prosperous period and the entry of the country in crisis. Crisis whose country has still not fully recovered until today despite the economic recovery in 1994. This recovery was accompanied by a major capital flight, i.e. $ 3350 and $ 2585.7 million between 1994 and 1995. However, the highest peak is observed in 2001 with a value of 6088.6. By analyzing the different components of capital flight, we can see that this peak is due to debt. Indeed, the year 2000 corresponds to Cameroon reaching the decision point of the IPPTE which allowed the Cameroonian government to obtain significant financial resources. The country has obtained from the IMF a $ 144 million Poverty Reduction and Growth Facility to finance its economic and financial program for the period from 1 October 2000 to 30 September 2003 and to the $ 1.3 billion external debt service remission.

Since 2002, there has been a slowdown in capital flight in Cameroon. This slowdown could be explained by the anti-corruption and misappropriation of public funds implemented in the country. Indeed, several studies have shown that corruption and misappropriation of public funds are important factors in the flight of capital (Ajayi, 1992).
In summary, the observation in the previous graph shows various trends in capital flight in Cameroon with several peaks. While it may be noted that the capital flight actually occurred in the country in 1977 coinciding with the beginning of oil exploitation, the highest peak appeared in 2001, when the country benefited from significant financial resources due to the external debt. This seems to confirm the point of view of Chipalkatti and Rishi (2001) for whom capital flight is quantitatively important when the level of indebtedness is high in the country.

3. Methodology and Data

3.1. ARDL Approach

According to Beja (2006),the Financial Revolving Door equation for Southeast Asiaeconomy is estimated by adopting economic growth, external debt, quality of institutions and trade openness, as determinants of capital flight.Allthese variables are included in a single multivariate framework. The same equation is used in ourpaper with some changes in the explanatory variables;

$$FCR_t = a_0 + a_1 debt_t + a_2 tpib_t + a_4 ouv_t + a_6 apd_t + \mathcal{E}_t \qquad (1)$$

$$DET_t = a_0 + a_2 fcr_t + a_3 tpib_t + a_5 ouv_t + a_6 apd_t + \mu_t \qquad (2)$$

Annual data for these variables from 1986 till 2013 are obtained from the World Development Indicators Database provided by the World Bank (World Bank, 2017), ICRG and Boyce and Ndikumana (2012).

Table 2. Description Of Variables

code	Variables	Sources
DET	External debt	WDI
FCR	Capital flight	Boyce and Ndikumana (2012)
TPIB	Economic growth	WDI
OUV	Trade openess	WDI
APD	Official assitance	WDI
IPC	Perception corruption index	ICRG

Source : author

The descriptive statistics, mean value, standard deviation and coefficient of variation of different variables are given in Table (1) in Appendix.
The autoregressive distributed lag (ARDL) – also known as bounds testing approach – is one of the most popular econometric procedures that has been extensively used in investigating
the environmental pollution functions. This is a single cointegration approach developed by Pesaran and al. (2001) and has some econometric advantages if compared to other single
cointegration procedures (Pesaran and*al.*, 2001)[1]. First, it gives unbiased estimates of the longrun coefficients even if there is an endogeneity problem among the regressors. Second, it can estimate the long and short-run parameters simultaneously. Third, it can test for the existence of a long-run relationship between the variables in levels irrespective of whether they are *I* (0), *I* (1), or a combination of both. Fourth, in small samples, it gives estimates with properties more superior to that of Gregory and Hansen cointegration procedures (Narayan 2005). Thus, the ARDL representation of equation (1) can be put as follows:

$$FCR_t = a_0 + a_1 debt_t + a_2 tpib_t + a_4 ouv_t + a_6 apd_t + a_2 \sum \Delta det_{t-i} + a_3 \sum \Delta tpibt_{-i} + a_5 \sum \Delta ouv_{t-i} + a_6 \sum \Delta apd_{t-i} + \mathcal{E}_t \qquad (3)$$

3.2 Estimation Procedure

Firstly, to estimate equation (2) by the Pesaran and al. (2001) procedure, we should examine each variable series included in equation (1) for its order of integration. This has been done by the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. The results reported in Table (2) in Appendix indicate that, at the 5% level of significance, all the series appear to contain a unit root in their levels but stationary in their first differences (i.e. they are *I* (1)). This provides a good rationale for carrying out the bounds testing approach.
Secondly, equation (2) is estimated by a specialized estimator that has been included in recent versions of EViews (EViews 10) for handling ARDL models. Fortunately, this estimator offers built-in lag-length selection methods, critical values for the bounds test, as well as other post-estimation tests. Based upon the estimation results of equation (2) - as displayed in Table (3) in Appendix – the ARDL bounds test is carried out. As it shows from Table (1), the F-statistic (3.829323) is bigger than the critical value of the upper bound at 5% significance level (3.38). Thus, we reject the null hypothesis of $\alpha1 = \alpha2 = \alpha3 = \alpha4 = 0$ (i.e. no cointegration among the relevant

[1]There are several examples of univariate cointegration approaches including Engle and Granger (1987) and the fully modified OLS procedures of Phillips and Hansen (1990). There are also many examples of multivariate cointegration procedures of Johansen (1988), Johansen and Juselius (1990), and Johansen's (1996) full information maximum likelihood technique.

variables) and conclude that there exists a long-run relationship between capital flight, external debt and others variables.

Table (1): ARDL Bounds Test

Sample:		1984-2013
Included	observations:	30
Null Hypothesis: No long-run relationships exist		
Test statistic	Value	k
F-statistic	3.829323	5
Critical Value Bounds		
Significance	I(0)Bound	I(1)Bound
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

4. Diagnostic Tests

Concerning the goodness of fit of the model specification, R-squared and adjusted R-squared, are0.782496 and 0.564991 respectively.The robustness of the model has been validated by several diagnostic tests.For example, Breusch-Godfrey serial correlation LM test, in Table (4) in Appendix, indicates that there is no serial correlation between the estimated model errors (F-statistic =0.239868 and P = 0.791).

Besides, CUSUM and CUSUMQ tests ascertain the stability of the estimated coefficients because the plot of each statistic falls inside the critical bands of the 5% confidence interval of parameter stability (See Figures 2&3). Also, Jarque-Bera normality test assures the normality of errors (Refer to Figure 3). Furthermore, Breusch-Pagan-Godfrey heteroskedasticity test, in Table (5) in Appendix, shows that the residuals don't suffer from heteroskedasticity (Obs*R2 = 16.8, P= 0.15). Given the above results, we can conclude that the outcomes reported are serially uncorrelated, normally distributed, and homoskedastic. Hence, the results reported are valid for reliable interpretations.

Figure (2): Results of CUSUM Test

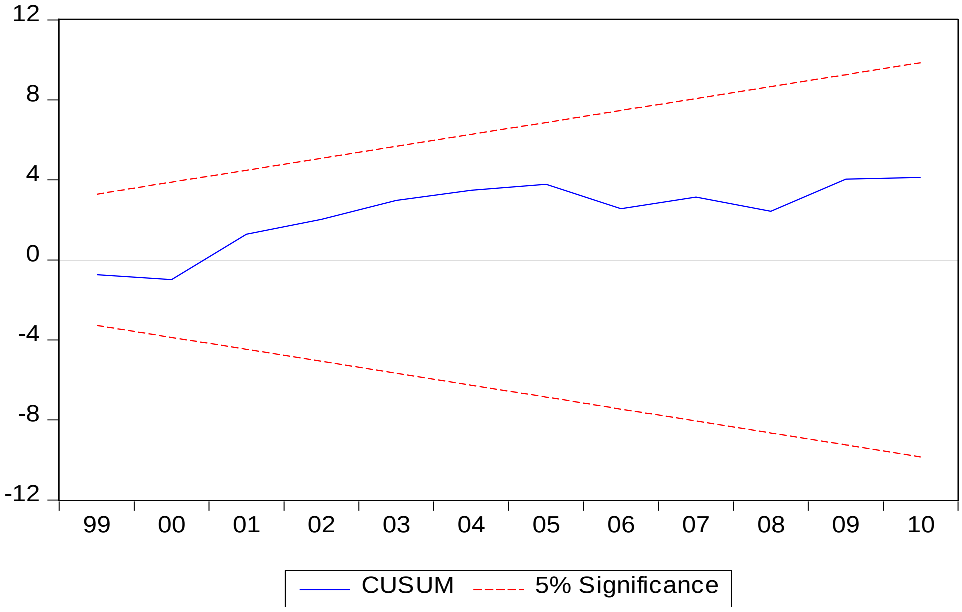


Figure (3): Results of CUSUMSQ Test

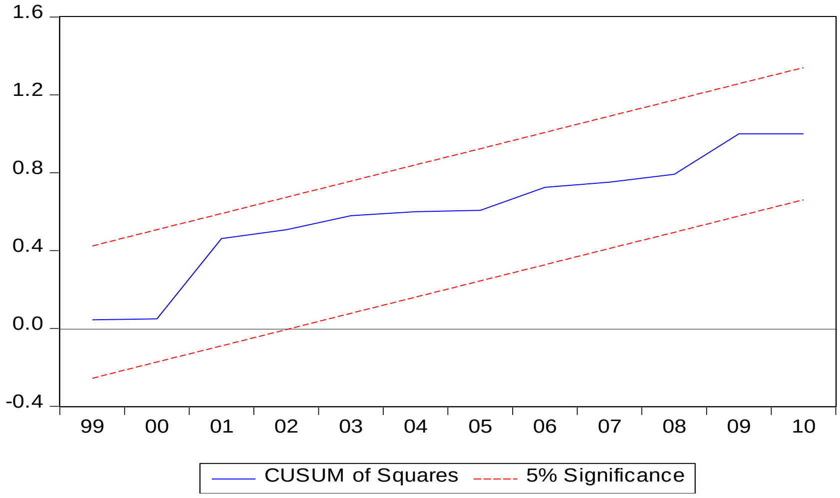
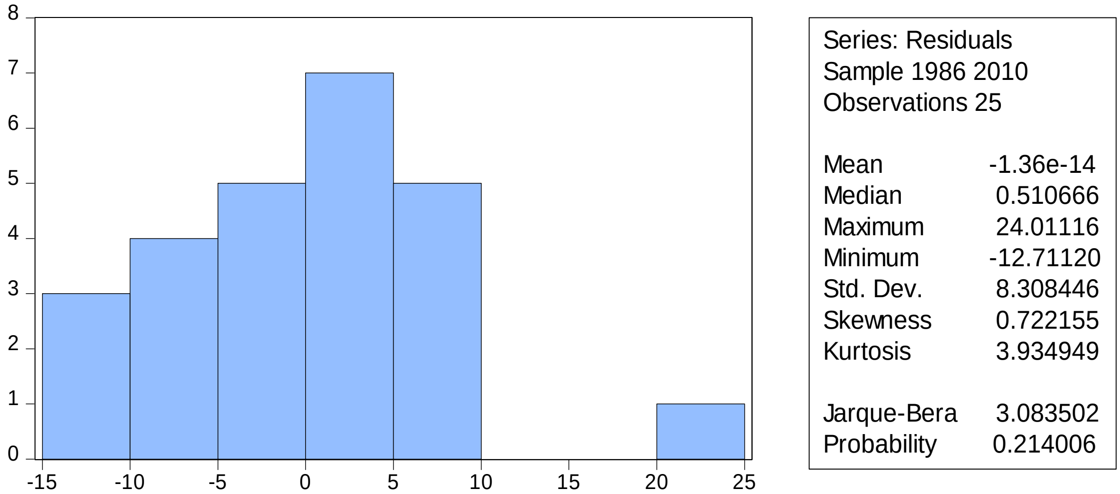


Figure (3): Results of Normality Test



5. Empirical Results

To capture the long and short-run relationships among the variables of our model, ARDL cointegrating form has been estimated. Results of the long-run estimated coefficients are shown in table (2).It is found that the long-run impact of external debt on capital flight in positive and significant while the impact of capital flight on debt is insignificant. The expected signs of these two variables indicate that there is still no evidence in favor of the Financial Revolving Door hypothesis in the Cameroonian economy.

Table (2): Estimated Long-Run Coefficients (Debt on capital flight)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DET	0.104181	0.081995	1.270580	0.028*
APD	1.622604	1.708051	0.949974	0.3609
TPIB	-2.854885	1.181957	-2.415387	0.032*
OUV	3.208141	0.915261	3.505165	0.0043*
IPC	-9.407327	4.024185	-2.337697	0.037*
C	-109.9450	41.96637	-2.619835	0.0224*

* indicates significance at the 5% level.

Capital flight on debt

ARDL Model	AIC	SC	Log likelihood	F Wald test	P of Wald test
ARDL(1,1,1)	8.5988	9.0373	-98.48522	1.027325	0.423200

Source : Eviews 10

Debt on Capital flight

ARDL Model	AIC	SC	Log likelihood	F Wald test	P of Wald test
ARDL(1,1,1)	8.8145	9.1557	-103.1814	6.043617	0.004900

Source : Eviews 10

Concerning the estimated long-run coefficients for trade openness, it is found to significant at 5% level. Official assistance, economic growthare found to be significant at 10% level. External debt, trade openness and official assistance has a positive relationship with capital flight in Cameroon while economic growth has a negative relationship with capital flight. So, good economic growth rates reduce capital flight. This implies that these two variables are interdependent in their impact on capital flight in Ethiopia.

Concerning the estimated short-run effects of our variables, they are displayed in table (3). It is found that all the variables are significant in the short-run. Also, the same interpretation for the estimated long-run effects offoreign trade, industrial sector, and their interaction term goes for their short-term impacts.

Also, the error correction mechanism (ECM) has been estimated to capture the speed of the adjustment of the model variables in the short-run in case any deviation from the long-run equilibriumoccurs. When ECM (-1) is negative and significant, this means that the model variables are errorcorrecting (adjusting) themselves till they reach their steady-state values (Enns et al 2014). In our case, the estimated coefficient of ECM is negative and statistically significant at 1%. This confirms

the existence of a stable long-run relationship between the regressors and the dependent variable capital flight. As it shows from table (3), ECM (-1) value is -1.570907. This suggests that when capital flight and the other regressors are above or below their equilibrium level, they adjust by almost 157% within the first year. The estimated ECM (-1) equation can be represented as follows:

ECM = FC - (0.1042*DET + 1.6226*APD - 2.8549*TPIB + 3.2081*OUV -9.4073*IPC – 109.9450)

Table (3): Estimated Short-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FC(-1))	0.247259	0.113515	2.178216	0.0501
D(DET)	0.536869	0.141130	3.804065	0.0025*
D(DET(-1))	0.934702	0.174589	5.353718	0.0002*
D(APD)	4.651938	0.923410	5.037783	0.0003*
D(OUV)	3.017280	0.402123	7.503374	0.0000*
D(IPC)	-30.82277	6.546912	-4.707986	0.0005*
ECM(-1)*	-1.570907	0.172051	-9.130446	0.0000*

* indicates significance at the 5% level

6. Conclusion

In this article, we examine the cointegrating relationship between external debt and capital flight in ARDL framework for the case of Cameroon. Cameroon is considered to be one of the countries with high level of capital flight and a very worrying pace of debt. Thus, this study investigates the long and short-run impacts of real GDP growth rate, trade openness, and corruption in Cameroon. This is done by using the ARDL method to estimate the impact of external debt and on capital flight from 1986 till 2010. Concerning the external debt impact on capital flight, empirical findings give no evidence on the existence of Financial Revolving Door hypothesis in Cameroon. Also, results show that the determinants of capital flight are corruption and trade openness.

Therefore, it is highly recommended for the Cameroonian government to apply economic policies against corruption to stimulate economic growth and better manage external debt. Also, the government should follow trade policies that contribute to the sustainability and improvement of livelihoods in developing countries. Such policies are widely supported and provided by International Centre for Trade and Sustainable Development, International Trade Centre, and World Trade Organization.

Appendix

Table (1): Descriptive Statistics

Mean	64.01481	4.406296	7.022222	8.123630	1.905963	42.16296
Median	56.80000	4.140000	-0.300000	9.500000	3.300000	40.20000
Maximum	125.9000	9.570000	63.30000	11.08400	8.064000	65.10000
Minimum	12.20000	1.650000	-15.80000	4.000000	-7.824000	31.80000
Std. Dev.	36.96137	2.146878	17.99828	2.459606	4.171927	7.897134
Skewness	0.178823	0.898401	1.368979	-0.231717	-0.750612	1.707691
Kurtosis	1.683055	3.317110	4.647458	1.434033	2.600882	5.818889
Jarque-Bera	2.095036	3.745187	11.48684	3.000402	2.714588	22.06234
Probability	0.350807	0.153724	0.003204	0.223085	0.257356	0.000016
Sum	1728.400	118.9700	189.6000	219.3380	51.46100	1138.400
SumSq. Dev.	35519.71	119.8362	8422.387	157.2912	452.5294	1621.483
Observations	27	27	27	27	27	27

Table (2): Unit Root Tests

Series	Level		1st Difference	
	ADF	PP	ADF	
FC	0.0030	0.003*	-	-
debt	0.8424	0.7589	0.0087*	0.0090*
ouv	0.0132	0.0095	0.0008*	0.0008*
apd	0.0345	0.0260	0.0001*	0.0000*
ipc	0.0463	0.3101	0.0067*	0.0074*
pib	0.0376	0.0376	0.0000	0.0000*

*The null hypothesis of a unit root is rejected by the Mackinnon critical values at 5%.

Table (3): ARDL Model Estimation Results

Dependent Variable: FC
Method: ARDL
Sample (adjusted): 1986 2010
Included observations: 25 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): DET APD TPIB OUV IPC
Fixed regressors: C
Number of models evaluated: 486
Selected Model: ARDL(2, 2, 1, 0, 1, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FC(-1)	-0.323647	0.174487	-1.854854	0.0883
FC(-2)	-0.247259	0.149226	-1.656950	0.1234
DET	0.536869	0.193407	2.775857	0.0168
DET(-1)	0.561491	0.330078	1.701087	0.1147
DET(-2)	-0.934702	0.246291	-3.795107	0.0026
APD	4.651938	1.853764	2.509455	0.0274
APD(-1)	-2.102979	1.713620	-1.227214	0.2433

TPIB	-4.484758	1.944387	-2.306514	0.0397
OUV	3.017280	1.089840	2.768553	0.0170
OUV(-1)	2.022411	0.755895	2.675517	0.0202
IPC	-30.82277	13.96282	-2.207489	0.0475
IPC(-1)	16.04474	12.00071	1.336983	0.2060
C	-172.7133	66.83106	-2.584327	0.0239

R-squared	0.782496	Mean dependent var	5.492000
Adjusted R-squared	0.564991	S.D. dependent var	17.81500
S.E. of regression	11.74992	Akaike info criterion	8.071600
Sum squared resid	1656.727	Schwarz criterion	8.705416
Log likelihood	-87.89500	Hannan-Quinn criter.	8.247394
F-statistic	3.597607	Durbin-Watson stat	2.287018
Prob(F-statistic)	0.017634		

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

Table 4: Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.239868	Prob. F(2,10)	0.7911
Obs*R-squared	1.144435	Prob. Chi-Square(2)	0.5643

Test Equation:
Dependent Variable: RESID, Method
Sample: 1986 2010
Included observations: 25
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FC(-1)	0.085990	0.232118	0.370459	0.7188
FC(-2)	0.021569	0.266510	0.080930	0.9371
DET	-0.006432	0.218331	-0.029459	0.9771
DET(-1)	-0.047785	0.370065	-0.129126	0.8998
DET(-2)	0.024260	0.312316	0.077676	0.9396
APD	0.024541	1.984576	0.012366	0.9904
APD(-1)	0.152181	1.858767	0.081872	0.9364
TPIB	0.248462	3.229720	0.076930	0.9402
OUV	-0.044699	1.700245	-0.026290	0.9795
OUV(-1)	-0.140807	0.995481	-0.141446	0.8903
IPC	-0.960114	18.23161	-0.052662	0.9590
IPC(-1)	0.559937	17.49838	0.031999	0.9751
C	8.706845	108.0208	0.080603	0.9373
RESID(-1)	-0.269984	0.396782	-0.680435	0.5117
RESID(-2)	-0.084134	0.681867	-0.123388	0.9042

R-squared	0.045777	Mean dependent var	-1.36E-14
Adjusted R-squared	-1.290134	S.D. dependent var	8.308446
S.E. of regression	12.57333	Akaike info criterion	8.184742
Sum squared resid	1580.886	Schwarz criterion	8.916067
Log likelihood	-87.30927	Hannan-Quinn criter.	8.387581
F-statistic	0.034267	Durbin-Watson stat	2.007368
Prob(F-statistic)	1.000000		

Table (5): Heteroskedasticity Test (Breusch-Pagan-Godfrey)

F-statistic	2.054574	Prob. F(12,12)	0.1133
Obs*R-squared	16.81555	Prob. Chi-Square(12)	0.1567
Scaled explained SS	5.685442	Prob. Chi-Square(12)	0.9311

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1475.332	533.2842	-2.766502	0.0171
FC(-1)	-2.920440	1.392332	-2.097517	0.0578
FC(-2)	-2.945185	1.190758	-2.473369	0.0293
DET	-1.141264	1.543306	-0.739493	0.4738
DET(-1)	7.955100	2.633885	3.020292	0.0107
DET(-2)	-4.342988	1.965303	-2.209831	0.0473
APD	33.08198	14.79227	2.236437	0.0451
APD(-1)	-24.03002	13.67398	-1.757354	0.1043
TPIB	-39.06155	15.51541	-2.517597	0.0270
OUV	25.20047	8.696474	2.897780	0.0134
OUV(-1)	12.93529	6.031733	2.144540	0.0532
IPC	-190.5101	111.4175	-1.709875	0.1130
IPC(-1)	146.2378	95.76067	1.527118	0.1527

R-squared	0.672622	Mean dependent var	66.26906
Adjusted R-squared	0.345244	S.D. dependent var	115.8712
S.E. of regression	93.75948	Akaike info criterion	12.22537
Sum squared resid	105490.1	Schwarz criterion	12.85919
Log likelihood	-139.8172	Hannan-Quinn criter.	12.40117
F-statistic	2.054574	Durbin-Watson stat	2.052945
Prob(F-statistic)	0.113339		

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