FDI inflows determinants in developing countries: A panel data analysis for some African countries

محددات تدفقات الاستثمار الأجنبي المباشر في البلدان النامية: تحليل بيانات البانل لبعض البلدان الإفريقية

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ملخص

تهدف هذه الورقة البحثية إلى دراسة العوامل المحددة لتدفقات الاستثمار الأجنبي المباشر في البلدان الإفريقية. تم استخدام تحليل بيانات البانل السنوية خاصة بـ 13 بلدا إفريقيا وذلك خلال الفترة الممتدة من 1990 إلى 2018. كما تم استعمال أساليب القياس الاقتصادي الحديثة لتحليل البيانات، بما في ذلك اختبار جذر الوحدة لبيانات البانل IPS لغرض اختبار مستوى الإستقرارية بين المجموعات، بالإضافة إلى استعمال تقدير متوسط المجموعة المجمعة (PMG) للتحليل القصير والطويل الأجل. واستنادًا إلى تقدير متوسط المجموعة المجمعة (PMG)، تُظهر النتائج أن حجم السوق، الانفتاح التجاري، ومعدل التضخم كلها عوامل محددة على المدى الطويل لتدفقات الاستثمار الأجنبي المباشر في 13 دولة إفريقية محل الدراسة.

الكلمات المفاتيح: الاستثمار الأجنبي المباشر، محددات الاستثمار الأجنبي المباشر، البلدان الافريقية، اختبار جذر الوحدة لبيانات البانل، متوسط المجموعة المدمجة.

تصنيف JEL: *C2* ، *F21*، *F23*.

Abstract

The aim of this study is to examine the determinants of FDI inflows in African countries. In this study, for the period 1990-2018, panel data analysis was conducted using annual data from 13 African countries. Modern econometric methods are used for data analysis, including the IPS Panel Unit Root Test to show the stationary level between groups, as well as the pooled mean group (PMG) estimation for short and long-run analyses. Based on the PMG estimator, the results show that market size, trade openness, and inflation rate are all long term determinants of FDI inflows in the 13 African countries under study.

Key words: ***Foreign Direct Investment, Determinants of FDI, African countries, Panel Unit Root test, PMG.***

Jel Classification Codes : ***C23, F21, F23.***

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I-Introduction:

Over the last few decades, the world has become more integrated as countries have opened themselves up to greater trade and capital flows with the rest of the world. More integration with the world creates more investment opportunities for investors both locally and abroad (Hanusch, Nguyen, & Algu, 2018). When not enough money is stored in many developing and emerging economies for investment purposes, countries are therefore trying to rely on foreign capital as a substitute for direct debits, either through direct or indirect investment, to finance these investment projects (Al Shubiri, 2016).

Policymakers have a long-standing concept that foreign direct investment (hereafter FDI) is much more inductive than other types of foreign capital flows to long-term economic growth and development (Sinha & Sen, 2016). Many possible effects may occur in host countries with FDI inflows. FDI inflows influence economic growth in the country and work to solve economic problems such as the transfer of advanced technologies and the integration of countries with global markets (Sagarik, 2015).

Due to the role of FDI in international economy globalization and national economic growth, the identification of possible determinants of foreign direct investment (FDI) flows has become a priority for many developing countries. An analysis of global trends indicates a remarkable increase in FDI volume to developing countries in the 1990s, especially after 1995. This significant rise in FDI in developing countries was mainly ascribed to the fast liberalization in these nations of domestic FDI legislation, which happened as a reaction to changing FDI perceptions (Polat & Payaslıoğlu, 2016).

Despite increasing interest in FDI inflows, there is considerable uncertainty about what drives foreign investors to work on foreign markets. The objective of this study is to identify key determinants of FDI inflows in developing countries. For this purpose, the present study considered data relating to FDI inflows in different developing countries for the period 1990-2018. The countries covered by the study include 13 developing countries from Africa. This research used pooled mean group estimation method or panel ARDL approach to observe the short-term and long-term effects of independent variables on dependent variables.

The remainder of this paper is organized as follows: Section 2 provides a review of the FDI literature and its determinants; Section 3 describes the data collection and the research methodology adopted for the study; the results are presented and discussed in Section 4; and, finally, Section 5 concludes by providing useful insights into the policy implications of the empirical findings.

II. Literature review

There is a significant number of studies that have tried to capture the factors that determine a country's FDI attractiveness, and how these factors or determinants affect the flows of FDI both in developed and developing countries. They have investigated and analyzed the relationship between FDI inflows and different variables.

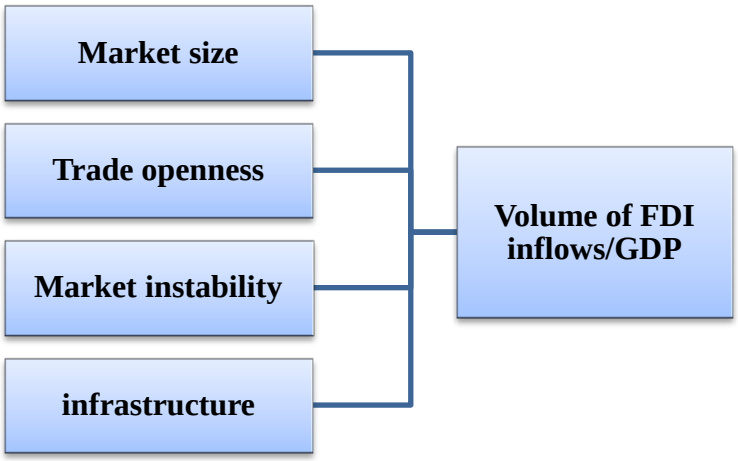
The market size of the host country has been considered to be the most significant determinant of FDI (Bevan & Estrin, 2004). Market size is usually measured by GDP per capita. Moreover, market size is normally considered to represent an efficient use of resources and economies of scale (Schneider & Frey, 1985). Agarwal (1980) and Billington (1999) argue that there is a dependent relationship between market size and FDI. Larger market size tends to perform better and accumulate larger profit for investment (Sagarik, 2015). Market size can attract horizontal FDI when investing firms want to capture a domestic market share (Arbatli, 2011).

Economic openness plays a vital role in countries' development (Bowie & Unger, 1997). Empirical studies such as those by (Bagli & Adhikary, 2014; Çeviş & Çamurdan, 2007; Edwards, 1990; Elizabeth Asiedu, 2002; Gastanaga, Nugent, & Pashamova, 1998; Janicki & Wunnava, 2004; Krifa-Schneider & Matei, 2010; Masron & Abdullah, 2010; Na & Lightfoot, 2006; Rogmans & Ebbers, 2013) found that FDI was positively correlated with the trade openness of any economy. while others provide insignificant results (Walsh & Yu, 2010).

Market instability expressed by high inflation was found to have a negative effect on FDI inflows as seen in many studies such as those by (Çeviş & Çamurdan, 2007; Demirhan & Masca, 2008; Krifa-Schneider & Matei, 2010; Rodríguez & Pallas, 2008; Walsh & Yu, 2010). therefore higher inflation rates increases the challenges and uncertainty and finally discourages long-term investment opportunity (Sagarik, 2015).

infrastructure is a another factor found to be a major determinant of FDI. Several studies such as those by (Apaydin, 2009; Hoang & Goujon, 2014; Rogmans & Ebbers, 2013) confirm a positive relationship between infrastructure and FDI inflows.

Figure n°1: Diagram of the Conceptual Framework



Source: Generated by the researchers based on the Literature review

III. Data and econometric methodology

This paper utilizes secondary data and mainly bases on quantitative research method. Annual dataset comprising of 13 African countries (Algeria, Cameroon, Congo (D.R), Côte d'Ivoire, Gabon, Ghana, Morocco, Nigeria, Sierra Leone, South Africa, Tunisia, Uganda, and Zambia) for the period of 1990 to 2018 is used for analysis. The total number of observation then becomes 377, which is appropriate. The data is collected from the World Development Indicators database of the World Bank and UNCTAD database. this study attempts to analyze the determinants of FDI by the percentage of FDI relative to GDP. The model specification of the analysis of the determinants of FDI in African countries indicates the variables included in the function below:

$$FDI = f\ (GDP, TO, INFL, INFRA) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (1)$$

In this study, the independent variables comprise of several variables. Firstly, GDP growth (Annual %) (GDP) is used to measure market size. Trade Openness (TO) is measured by the total volume of export and import relative to GDP. Inflation rate (INFL) is used to measure inflation and percentage of internet users is taken as a proxy of infrastructure

development (INFRA). Based on the conceptual framework, the regression model equations will assume this form;

$$FDI_{it} = a + \beta_1 GDP_{it} + \beta_2 TO_{it} + \beta_3 INFL_{it} + \beta_4 INFRA_{it} + u_{it} \ldots\ldots\ldots\ldots (2)$$

In Equation (2), a shows the constant term, while $(\beta_1, \beta_2, \beta_3, \beta_4)$ represents the coefficients that specify the relationship between the dependent variable and the independents variables; $(i = 1 \ldots\ldots N)$ denotes the countries, and u_{it} refers to the error term.

Table n°1: Variables Used for Analysis along with their Symbols

Variables	Sympbols	Data Sources
The percentage of FDI relative to GDP	**FDI**	UNCTAD database
GDP growth (Annual %)	**GDP**	The World Development Indicators database of the World Bank
Trade Openness	**TO**	
Inflation rate	**INFL**	
The percentage of internet users	**INFRA**	

Source: Prepared by the researchers.

The model was primarily defined. Before analyzing the relationship between the series, to choose the appropriate testing methods, the correlation between the variables and the stationarity of the series was tested. After determining the optimum lag-length, the PMG Estimator was used to determine both the long-term and the short-term relationship between the variables in the model.

IV - Results and discussion:

IV-1-Descriptive Statistics

The descriptive statistics shown in Table 2 illustrate the observation values, the mean, standard deviation, the minimum and the maximum to show the characteristics of the series.

Table n°2: Descriptive Statistics

Variables	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
FDI	377	3.156213	2.070000	50.01802	-8.589432	4.665944
GDP	377	1.969216	2.444381	21.02806	-22.31225	4.619948
TO	377	62.75545	60.27726	116.0484	20.72252	20.11981
INFL	377	108.0937	6.138511	23773.13	-30.85616	1253.618
INFRA	377	8.851350	1.591641	61.76221	0.000000	14.41365

Source: Prepared by the researchers based on the output of Eviews 10.

IV-2-Correlation Analysis

The relationship between the explanatory variables must be revised. If the coefficient of correlation is 0.80 or above, there is a sign of a linear relationship between variables and should, therefore, be removed as not all regressors are included in the model. Table 3 shows the results of the correlations between the variables:

Table n°3: Analysis of correlation

	FDI	GDP	TO	INFL	INFRA
FDI	1.000000				
GDP	0.174389	1.000000			
TO	0.101101	0.049646	1.000000		
INFL	-0.049005	-0.171768	-0.058184	1.000000	
INFRA	0.200480	0.100514	0.262153	-0.048954	1.000000

Source: Prepared by the researchers based on the output of Eviews 10.

The findings of the correlation analysis in Table 3 indicate that none of the statistics of correlation is equal to or above 0,80. Therefore, the explanatory variables do not have a linear correlation.

IV-3-Panel Unit Root Test

The first step towards data analysis is to detect the unit root presence, indicating the data is not stationary. The series stationarity is a crucial point in deciding the appropriate test method which shows the relationship between variables. Table 4 summarizes the findings of the panel unit root test, the Im, Pesaran and Shin test is used to analyze the presence of the unit root.

Table n°4: The Im, Pesaran and Shin Panel Unit Root Test

Variable	At Level		At First Difference	
	With Intercept	With Intercept and Trend	With Intercept	With Intercept and Trend
FDI	-7.33691*** (0.0000)	-8.53372*** (0.0000)	-	-
GDP	-7.91059*** (0.0000)	-3.27562*** (0.0005)		
TO	-1.66559** (0.0479)	-1.44214* (0.0746)	-	-
INFL	-7.00681*** (0.0000)	-12.9781*** (0.0000)	-	-
INFRA	3.59497 (0.9998)	4.34186 (1.0000)	-2.52698*** (0.0058)	-1.30935* (0.0952)

Note: The signs ***, ** and * indicate significance at 1%, 5% and 10% level, respectively.

Source: Prepared by the researchers based on the output of Eviews 10.

The results of panel unit root tests are recorded in Table 4 while intercept and intercept and trend data are observed. The results of Table 4 show that FDI, GDP, TO, INFL are stationary at the level with p-values of the statistics at 1%, 5%, 10% both with intercept and with intercept and trend, while the variable INFRA is non-stationary. But, once the first-order differences were observed, INFRA became stationary both with intercept and with intercept and trend, with p-values of the statistics at 1%.

As a consequence, the FDI, GDP, TO and INFL integration orders are I(0) and INFRA integration orders is I(1).

IV-3-Pooled mean group estimation

The next step, after observing the data stationarity, is to analyze the data by using the appropriate regression model. The regression model choice is dependent on the data type. To observe the short-run and long-run effects of independent variables on dependent variable, this research has applied (PMG) pooled mean group estimation technique or panel ARDL approach.

Based on the ARDL model, the model can be redefined. The error correction model of the re-parameterized ARDL (m, n, n, n) is expressed as:

$$\Delta y_{it} = \theta_i\left[y_{i,t-1} - \lambda'_i X_{i,t}\right] + \sum_{j=1}^{m-1} \xi_{ij}\, \Delta y_{i,t-j} + \sum_{j=0}^{n-1} \beta'_{ij}\, \Delta X_{i,t-j} + \varphi i + e_{it} \ldots\ldots\ldots\ldots (3)$$

λ' is the vector symbolizing the long-term relationships in equation (3). the error correction term is expressed by the expression of $\left[y_{i,t-1} - \lambda'_i X_{i,t}\right]$. ξ_{ij} and β' are the coefficients of short-term dynamic. The model can be defined as follows:

$$\Delta FDI_{it} = \theta_i\left[FDI_{i,t-1} - \lambda'_i X_{i,t}\right] + \sum_{j=1}^{m-1} \xi_{ij}\, \Delta FDI_{i,t-j} + \sum_{j=0}^{n-1} \beta'_{ij}\, \Delta X_{i,t-j} + \varphi i + e_{it} \ldots\ldots\ldots\ldots\ldots (4)$$

The PMG estimator allows intercepts, short-run coefficients and variances of errors to differ across countries, but limits the long-run coefficients to be the same (Pesaran et al., 1999). We consider all countries to have a common ARDL (1,1,1,1,11) specification. Table 5 presents the outcomes of the PMG Estimator.

Table n°4: The Im, Pesaran and Shin Panel Unit Root Test

Variable	Coefficient	Std. Error	t-Statistic	Probability
Long Run Equation				
GDP	0.147564***	0.038633	3.819639	0.0002
TO	0.039524***	0.011721	3.372038	0.0008
INFL	-0.000354*	0.000201	-1.762673	0.0790
INFRA	-0.002213	0.007910	-0.279722	0.7799
Short Run Equation				
COINTEQ01	-0.620910	0.092368	-6.722158	0.0000
D(GDP)	-0.048564	0.043133	-1.125900	0.2611
D(TO)	0.009422	0.032083	0.293674	0.7692
D(INFL)	0.108245	0.112531	0.961914	0.3369
D(INFRA)	-0.004092	0.031204	-0.131152	0.8957
C	0.511262	0.553858	0.923093	0.3567

Note: The signs ***, ** and * indicate significance at 1%, 5% and 10% level, respectively.

Source: Prepared by the researchers based on the output of Eviews 10.

Table 5 contains the values of the coefficient, standard errors, t-statistics and probabilities of the model's variables. The top part of the table shows the relationships of the long term. The short-term relationships are shown in the bottom of the table. COINTEQ01 reflects the variable's joint effects.

Long-Run Results

The long-term results presented in Table 5 show that GDP growth (Annual %) (GDP), Trade Openness (TO) have significant, positive impact on the percentage of FDI relative to GDP (FDI) while Inflation rate (INFL) has negative impact on (FDI) at 5%, 10% level of significance. However, infrastructure development (INFRA) does not have an impact on FDI in the long-term. The most effective determinant of foreign direct investment (FDI) is GDP growth (GDP). Accordingly:

(a) a 1% rise in GDP increases FDI by 0.15%

(b) a 1% rise in TO increases FDI by 0.04%

(c) a 1% rise in CREDIT decreases FDI by 0.0004%

Short-Run Results

The pooled mean group estimation technique also provides short-term results. The negative sign of the error correction term (ECT) shows the long-term convergence of variables. In the short term, the variables influence each other and create a joint long-term effect on FDI. The coefficient of the error correction term (ECT) for the short-run model is equal to (-0.62), which shows that the short-run deviation in FDI is corrected by 62 percent on the long-run each year. The results are significant at 1% level.

V-Conclusion

This study aims to investigate the main determinants affecting FDI inflow in African countries through the use of panel root unit testing and pooled mean group estimation techniques during the 1990-2018 period. To this end, 13 African countries are considered in the analysis. Findings show that market size, trade openness have a positive impact on foreign direct investment inflows, while the inflation rate has a negative impact on (FDI). Such determinants have an important role to play in attracting FDI.

Market size in African countries is estimated to be the most important determinant of FDI inflows, this result is supported by (Agarwal, 1980; Billington, 1999; Sagarik, 2015). Nations with greater opportunities to grow could attract more FDI, and then those FDI inflows can improve economic development. Once the country has more opportunities, the inflow of FDI will increase. The greater FDI inflow concentrates more on a market-oriented approach in order to improve consumer choice and increase competition.

Trade openness is also a key determinant that has a positive impact on FDI, which is similar to the findings of many studies such as those conducted by (Bagli & Adhikary, 2014; Çeviş & Çamurdan, 2007; Edwards, 1990; Elizabeth Asiedu, 2002; Gastanaga et al., 1998; Janicki & Wunnava, 2004; Krifa-Schneider & Matei, 2010; Masron & Abdullah, 2010; Na & Lightfoot, 2006; Rogmans & Ebbers, 2013). In this regard, it suggests that if African countries are able to follow a policy that leads to greater degree of openness they will attract more FDI.

The inflation rate impacts FDI inflows negatively, and this has been confirmed by several studies such as those conducted by (Çeviş & Çamurdan, 2007; Demirhan & Masca, 2008; Krifa-Schneider & Matei, 2010; Rodríguez & Pallas, 2008; Walsh & Yu, 2010). The inflation rate may represent the macroeconomic instability. The stable macro economy can reduce the investment environment's uncertainty And contributes to the status of economic progress and thus increases the degree of confidence in economic activity (Sagarik, 2015).

The empirical findings have significant political implications that suggest the factors on which the host economies must concentrate to attract FDI inflows. Policymakers would be

able to understand the significance of the main determinants of FDI listed in the paper and to take steps to develop policies that encourage Foreign direct investment. Such measures could include developing the size of the market, making the laws more attractive to international trade. In addition, steps could be taken to keep inflation rates under control, since this factor has been identified as having an impact on FDI.

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Appendix

Lag Length

Model Selection Criteria Table
Dependent Variable: FDI
Date: 10/12/19 Time: 18:10
Sample: 1990 2018
Included observations: 377

Model	LogL	AIC	BIC*	HQ	Specification
1	-672.875707	4.147669	5.025599	4.496606	ARDL(1, 1, 1, 1, 1)

Dependent Variable: D(FDI)
Method: ARDL
Date: 10/12/19 Time: 17:52
Sample: 1991 2018
Included observations: 364
Dependent lags: 1 (Fixed)
Dynamic regressors (1 lag, fixed): GDP TO INFL INFRA
Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
GDP	0.147564	0.038633	3.819639	0.0002
TO	0.039524	0.011721	3.372038	0.0008
INFL	-0.000354	0.000201	-1.762673	0.0790
INFRA	-0.002213	0.007910	-0.279722	0.7799
Short Run Equation				
COINTEQ01	-0.620910	0.092368	-6.722158	0.0000
D(GDP)	-0.048564	0.043133	-1.125900	0.2611
D(TO)	0.009422	0.032083	0.293674	0.7692
D(INFL)	0.108245	0.112531	0.961914	0.3369
D(INFRA)	-0.004092	0.031204	-0.131152	0.8957
C	0.511262	0.553858	0.923093	0.3567

Mean dependent var	0.072180	S.D. dependent var	4.976583
S.E. of regression	3.885430	Akaike info criterion	4.004646
Sum squared resid	4453.487	Schwarz criterion	4.859935
Log likelihood	-672.8757	Hannan-Quinn criter.	4.344131

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

Cross-section Short Run coefficients

South Africa

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.915333	0.034818	-26.28942	0.0001
D(GDP)	-0.454512	0.201280	-2.258110	0.1091
D(TO)	-0.151909	0.230568	-0.658847	0.5570
D(INFL)	-0.113486	0.959707	-0.118250	0.9133
D(INFRA)	-0.034186	0.055737	-0.613346	0.5830
C	6.278227	6.224740	1.008593	0.3875

Morocco

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.613273	0.034944	-17.54996	0.0004
D(GDP)	-0.018913	0.001154	-16.39101	0.0005
D(TO)	-0.008825	0.001351	-6.530698	0.0073
D(INFL)	-0.060095	0.015664	-3.836515	0.0312
D(INFRA)	-0.018010	0.000409	-44.06291	0.0000
C	-0.763913	0.315913	-2.418116	0.0943

Ghana

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.146032	0.008699	-16.78814	0.0005
D(GDP)	0.033868	0.010208	3.317734	0.0451
D(TO)	0.020401	0.000417	48.98302	0.0000
D(INFL)	-0.002738	0.000519	-5.280615	0.0132
D(INFRA)	0.050884	0.001571	32.39353	0.0001
C	0.096025	0.080363	1.194892	0.3180

Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.220698	0.014777	-14.93539	0.0007
D(GDP)	-0.083694	0.001796	-46.60674	0.0000
D(TO)	-0.035612	0.000384	-92.84564	0.0000
D(INFL)	-0.006518	0.000188	-34.72683	0.0001
D(INFRA)	-0.078154	0.001717	-45.51017	0.0000
C	0.024169	0.035646	0.678027	0.5464

Algeria

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.515842	0.038658	-13.34379	0.0009
D(GDP)	-0.058223	0.001909	-30.50388	0.0001
D(TO)	-0.049889	0.000480	-103.9766	0.0000
D(INFL)	0.008516	0.000339	25.09374	0.0001
D(INFRA)	-0.017917	0.000143	-124.8977	0.0000
C	-0.886798	0.240689	-3.684423	0.0347

Congo D.R

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.941873	0.030491	-30.88983	0.0001
D(GDP)	0.253091	0.049236	5.140327	0.0143
D(TO)	0.046121	0.001839	25.07517	0.0001
D(INFL)	0.000199	1.15E-08	17211.64	0.0000
D(INFRA)	0.113111	0.086488	1.307823	0.2821
C	1.177065	0.667321	1.763865	0.1759

Uganda

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.211861	0.011617	-18.23791	0.0004
D(GDP)	0.041513	0.003162	13.13063	0.0010
D(TO)	-0.031482	0.001634	-19.27073	0.0003
D(INFL)	0.035586	0.001152	30.90162	0.0001
D(INFRA)	-0.101605	0.001628	-62.40563	0.0000
C	0.458871	0.039592	11.59002	0.0014

Tunisia

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.959117	0.033657	-28.49656	0.0001
D(GDP)	-0.020118	0.013161	-1.528669	0.2238
D(TO)	0.033011	0.001852	17.82838	0.0004
D(INFL)	-0.011880	0.001069	-11.11805	0.0016
D(INFRA)	0.006384	0.001454	4.391296	0.0219
C	-1.151640	1.112669	-1.035024	0.3768

Côte d'Ivoire

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.465960	0.027146	-17.16515	0.0004
D(GDP)	-0.057649	0.002359	-24.43349	0.0002
D(TO)	0.021494	0.000707	30.41089	0.0001
D(INFL)	-0.021420	0.000632	-33.90890	0.0001
D(INFRA)	0.004172	0.000319	13.06445	0.0010
C	-0.648401	0.255287	-2.539892	0.0847

Gabon

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.434249	0.023762	-18.27529	0.0004
D(GDP)	-0.026602	0.024085	-1.104514	0.3500
D(TO)	-0.078036	0.014271	-5.468205	0.0120
D(INFL)	0.103227	0.005840	17.67546	0.0004
D(INFRA)	0.113214	0.009536	11.87196	0.0013
C	-0.676392	0.734112	-0.921375	0.4248

Camerron

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-1.060503	0.032861	-32.27219	0.0001
D(GDP)	-0.095236	0.008732	-10.90671	0.0016
D(TO)	-0.083099	0.001423	-58.40874	0.0000
D(INFL)	0.021610	0.000578	37.38822	0.0000
D(INFRA)	-0.001255	0.002059	-0.609489	0.5853
C	-0.672025	0.363683	-1.847830	0.1618

Sierra Leone

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.518704	0.017987	-28.83738	0.0001
D(GDP)	-0.151913	0.005501	-27.61447	0.0001
D(TO)	0.319659	0.006534	48.92000	0.0000
D(INFL)	1.448498	0.249660	5.801875	0.0102
D(INFRA)	-0.270278	0.160851	-1.680304	0.1915
C	1.266044	0.981805	1.289507	0.2876

Zambia

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-1.068387	0.044134	-24.20792	0.0002
D(GDP)	0.007060	0.012595	0.560571	0.6142
D(TO)	0.120650	0.004518	26.70163	0.0001
D(INFL)	0.005687	0.000221	25.73952	0.0001
D(INFRA)	0.180439	0.006617	27.27101	0.0001
C	2.145179	0.967367	2.217543	0.1133