FDI, GDP and CO₂ explosion in Nigeria

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Abstract

Foreign investment remains the global avenue to promote viable economic performance in several nations. However, it is important to recognize means of attaining sustainability. Hence, the study analyse the influence of FDI, GDP and financial performance on CO_2 explosion in Nigeria from 1980 to 2019, using ARDL approach. The outcome of the study illustrates that FDI and economic progress accelerates the level of CO_2 explosion from the short run estimates. Nonetheless, the estimated long run analysis reveals that FDI, GDP and financial performance reduce the capacity of CO_2 explosion in the nation. Therefore, the study suggests that policymakers should emphasize on the measures to continue in promoting environmental quality through using other low energy emissions sources.

Key words: FDI, GDP, CO_2, ARDL, Nigeria

1. INTRODUCTION

The current global agenda is concern more on attaining sustainability (IPCC 2018). It is argued that the present climate issues have been linked with the increased global heat that caused environmental damage (IPCC, 2018). It is believed that by the year 2035 the total accumulated CO_2 explosion will reach about 37.6 billion kilotons and has increased by almost 3.6 per cent annually (Yahaya, Mohd-jali, and

Raji 2020). In this regard several studies have analysed the link among economic related factors and environmental sustainability. For instance, Abdouli and Hammami (2017) emphasized that environmental deterioration exist in Africa due to the deposit of pollution and waste from industrialized nations. Nonetheless, Hassaballa (2015) stressed that FDI promotes welfare as a result of trading of technology and innovation among developed and emerging economies. Similarly, Shahbaz et al. (2013) argued that trade performance enhance environmental sustainability through foreign direct investment as it came along with innovation, research and development in the emerging nations. However, it is believed that in the process of attaining economic advancement as well as the mix up of production inputs deteriorates environmental quality due to the extent of waste generated. Moreover, the theoretical postulation of this nature was illustrated by EKC hypothesis. The theory stated that at the initial stage of economic progress environmental degradation rises and then latter declines (Kuznets, 1955).

In Nigeria, the level of FDI inflow and economic progress are both increasing in a positive direction in the past decade (WDI, 2019). The nation was in abundant of natural factors that attract FDI for the purpose of economic development. It is emphasized that FDI has promotes the capacity of employment generation, income, innovation, research and development in the nation. Furthermore, the level of CO_2 explosion in nation has increased by almost 26 per cent in a decade (WDI, 2019). Therefore, this trend may be connected with risen inflow of foreign investment and economic progress in Nigeria. Hence, the study investigates the influence of FDI, trade, GDP and CO_2 explosion in Nigeria.

2. REVIEW OF LITERATURE

The linkage among FDI, GDP and trade have been analysed in the literature. For example, Ren et al. (2014) examines the effect of FDI, GDP and trade on CO_2 explosion in China, using GMM approach from 2000 to 2010. The outcome of the study illustrates that FDI increase the level of CO_2 explosion. Zakarya et al. (2015) stressed that FDI accelerates the capacity of CO_2 discharge in BRICS nations. Similarly, Seker et al. (2015) investigate the influence of FDI on CO_2 explosion in Turkey, using ARDL technique. The result reveals that FDI

positively influence CO_2. Gökmenoğlu and Taspinar (2016) studied the influence of FDI, GDP growth and energy in Turkey from 1974 to 2010. The study finding indicates that FDI and energy accelerate the level of CO_2. Bakhsh et al. (2017) employ 3SLS approach to examine the influence of FDI and trade on CO_2 in Pakistan from 1980 to 2014. The result reveals that FDI and trade upsurge CO_2 explosion. Al-Mulali et al. (2017) argued that FDI positively influence CO2 in Ghana and China. Salahuddin et al. (2018) used ARDL technique to study the influence of FDI on CO_2 in Kuwait. The outcome shows that FDI increase the capacity of CO_2 explosion.

In another development, Chen et al. (2019) investigated the influence of GDP on CO_2 discharges in China. The result indicates output growth accelerates CO_2 emissions. Zheng-xin Wang and Li (2019) apply nonlinear modelling to explore the influence of economic progress on CO_2 releases in China. The study reveals that GDP increased CO_2 discharges. Bekun et al. (2019) contend that GDP increase the amount of CO_2 productions in the selected EU states. This result is similar with the acquired from (Hanif et al. 2019). Based on the reviewed several studies have analyse link among FDI, GDP and trade in the literature, however, very few studies on the influence of the percentage in flow of foreign investment on CO_2 explosion exist in Africa. Therefore, this study examines the influence of FDI, GDP and trade on CO_2 explosion in Nigeria.

3. DATA AND METHOD

Yearly data on FDI (percentage of inflow), GDP (current USD), trade (exports and imports) from 1980 – 2019. The data was obtained from WDI. Table 2 shows the nature of the variables for the study.

Table 2: Nature of the data

	CO₂	CAP	GDP	FDI	EXP	IMP
Mean	0.597537	37.10837	1740.526	1.794531	19.34768	12.89023
Median	0.587523	36.62556	1514.098	1.641739	20.97477	12.98578
Maximum	0.873822	89.38105	2563.092	5.790847	36.02327	22.81126
Minimum	0.325376	14.90391	1323.501	0.257422	5.249090	3.029761
Std. Dev.	0.170823	19.29095	432.7539	1.252732	8.292608	5.395536
Skewness	-0.041543	0.983760	0.739389	1.306944	-0.160902	0.022021
Kurtosis	1.863995	3.673443	1.986059	4.848466	2.095645	2.423852
Jarque-Bera	2.000174	6.667184	4.956247	15.80091	1.420516	0.514740
Probability	0.367847	0.035665	0.083901	0.000371	0.491517	0.773082

Sum	22.10886	1373.010	64399.47	66.39765	715.8640	476.9385
Sum Sq. Dev.	1.050502	13397.07	6741934.	56.49611	2475.625	1048.025
Observations	37	37	37	37	37	37

3.1 Model specification

For the purpose of analysing the influence of FDI, GDP and trade the used a modified model by Al-Mulali, et.al, (2017) and employed an ARDL technique for the estimation.

$$L(CO_2)_t = \alpha_0 + \alpha_1 \, L\,GDP_t + \alpha_2 \, LCAP_t + \alpha_3 \, LFDI_t + \alpha_4 \, LEXP_t + \alpha_5 \, LIMP_t + \varepsilon_t \ (1)$$

In equation 1: $L(CO_2)$ is the carbon explosion, L GDP shows economic progress, LCAP indicates the capital formation, LFDI illustrates FDI inflow, LEXP illustrates the level of exportation, LIMP is the importation.

4. RESULT

This section discusses the study's outcome. Table 3 shows that stationary of the variables are in mixed nature.

Table 3: Outcome of the stationarity

Variable	PP		PP	
	LEVEL		First diff	
LINF	-2.0193*	(0.2776)	-5.8141*	(0.0000)
LMS	-0.1931	(0.9304)	-3.7667	(0.0071)
LFD	-2.6656	(0.0899)	-10.255	(0.000)
LGDP	-1.3737	(0.5841)	-6.2153	(0.000)
LTO	-2.0650	(0.2593)	-8.0385	(0.000)
IMP	-1.7082	(0.4187)	-6.8555	(0.000)

Table 4 indicates the existence of long run association for the variables as shown by the bound test.

Table 4: Bound test outcome

	1%		5%	
F-statistics	I(0)	I(1)	I(0)	I(1)
12.78	3.5	4.63	2.81	3.76

Table 5 illustrates the result of model estimated. The outcome of estimated model shows the existence of long run linkage among the variables as shown in the bound test. The estimate from the short run

analysis reveals that FDI, GDP and trade positively influence CO_2 explosion. However, the estimate from the long run analysis indicates that FDI, GDP and trade negatively influence the CO_2 explosion. This indicates that a percentage change in FDI leads to 0.34 per cent reduction in CO2 explosion. This outcome indicates is justified by the study of (Gökmenoğlu and Taspinar, 2016). Similarly, a rise in GDP growth by one per cent caused CO_2 explosion to reduce by 0.98 per cent. The result also shows that importation of good and services to the nation reduce CO_2 explosion by 0.48 per cent. Nonetheless, exportation and capital increase the level of CO_2 explosion in Nigeria by 0.33 and 0.74 per cent. Hence, based on the finding of the study FDI and GDP growth reduced the capacity of CO_2 explosion. Therefore, there is need for the nation's policymakers to emphasize more on the measure to further decorating the level of CO_2 discharge for the purpose of attaining environmental quality and sustainable growth.

**Table 5: estimated result of the model**

Variables	Long Run		Short Run
GDP	-0.9881**	ΔGDP	0.9719**
	(0.0079)		(0.0195)
FDI	-0.3433***	ΔFDI	0.1614***
	(0.0610)		(0.0269)
CAP	0.7438	ΔCAP	-0.8038
	(0.0487)		(0.1367)
EXP	0.3306*	ΔEXP	-0.1165*
	(0.0821)		(0.0368)
IMP	- 0.4881**	ΔIMP	-0.1320**
	(0.0540)		(0.0444)
C	-2.7717	ECMt−1	-0.9175***
	(4.3820)		(0.0751)

***, **, * indicate significance at 1%, 5% and 10%

Validation test

The outcome of the validation test shows that the model is stable as the line remains with in the critical lines at 5% level in figure 1.

Fig. 1: Stability test

(CUSUM)   (CUSUMSQ)
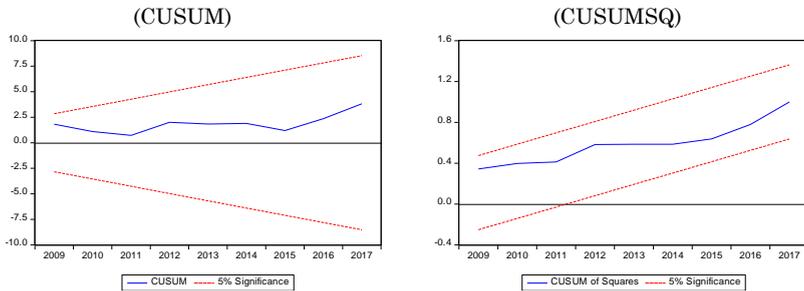
5. CONCLUSION

The study analyses the influence of FDI, GDP and trade on CO_2 explosion in Nigeria, by using ARDL method from 1980 to 2019. The estimates outcome reveals that FDI, GDP and trade decelerate the level CO_2 explosion in the long-run. In the short run the result shows that FDI, GDP and trade increase CO_2 explosion. The finding also reveals that export and capital increase the level of CO_2 explosion in the nation. Therefore, it is essential for the policymakers to design polices to attract FDI and environmental quality.

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