The Impact of Foreign Direct Investment on Carbon Dioxide Emissions in West Africa.

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Abstract

The work focuses on the impact of Foreign Direct Investment (FDI) on the environment. To this end, a purpose-built dataset containing statistics for 16 West African countries over 30 years (from 1980 to 2010) is analysed through the econometric technique of panel data. The study identified FDI, GDP per capita and capital-labour ratio as the key determining factors of CO2 emissions in West Africa. The magnitude of the adverse composition and favourable scale effects of FDI more than offset the benefit of the favourable technique effect and thus, making FDI detrimental to Carbon dioxide emission and hence detrimental to the environment.

Keywords: FDI, CO2 emissions

INTRODUCTION

The increasing threat of global warming and climate change has been a major, worldwide, ongoing concern during the last two decades. The 1997 Kyoto protocol had the objective of reducing greenhouse gases (GHGs) which cause climate change. It demanded the reduction of GHG emissions to 5.2% lower than the 1990 level during the period between 2008 and 2012. It came into force in 2005. Amongst several environmental pollutants causing climate change, carbon dioxide (CO2) is held responsible for 58.8% of GHGs (World Bank 2007). Although almost every country in West Africa signed the Kyoto protocol to curb emission levels, there

are still environmental concerns, given the region's recent economic growth. Arguably, average measures of CO2 per capita for ECOWAS countries are relatively low, compared to the numbers recorded for industrial countries. For example, CO2 for China, Japan, UK and USA stood at 2.23, 8.41, 10.08 and 19.81 respectively in 1965-2009 (World Bank, 2013). Compare these figures to those of Benin, Burkina Faso, Cote d'Ivoire, Gambia The, Ghana, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo measured at 0.19, 0.06, 0.48, 0.19, 0.29, 0.46, 0.05, 0.09, 0.60, 0.42, 0.33 and 0.21 respectively (World Bank, 2013). ECOWAS countries may have the benefit of learning early and by involving themselves in environmental activism and awareness and therefore would not need to wait for too long for per capita income to improve to the levels recorded in industrial nations before they begin to appreciate cleaner environment.

However, given the current level of economic development in the ECOWAS region, recorded carbon per capita is relatively high and worrisome. This fear is buttressed by the fact that the region is in quest for rapid industrialization and carbon per capita may aggravate as the region industrializes.

Within policy circles, there is a widespread belief that foreign direct investment (FDI) enhances the productivity of host countries and promotes economic growth. The notion supports FDI may not only provide direct capital financing but may also create positive externalities via the adoption of foreign technology and know-how. Foreign direct investment (FDI) inflows have rapidly increased during the past two decades in almost every region of the world, thus revitalizing the long debate in both academic and policy spheres about their advantages and related costs. Indeed, FDI inflows may provide direct capital financing, generate positive externalities, and consequently stimulate economic growth through technology transfer, spillover effects, productivity gains, and the introduction of new processes and managerial skills (Lee, 2013). These inflows have been encouraged and welcomed by LDCs because of the important role they play in domestic economies as a source of growth and job creation (Borensztein et al., 1999). However, there are concerns that LDCs could competitively undercut each other's environmental regulations to attract FDI (Elliot & Shimamoto, 2008). This "race to the bottom" in LDCs have resulted in these countries becoming "pollution havens", where multinational corporations (MNCs) locate operations to save on environment-related costs (Grossman & Krueger, 1991; Mani & Wheeler, 1998).

Economic development today is global. Many companies are taking part in the global distribution of investment, and many countries encourage the use of foreign investment to promote their economic growth. However, the environmental problems hidden behind this situation should not be overlooked. In recent years, air pollution and global climate change issues caused by greenhouse gases have become the focus of international attention. The Intergovernmental Panel on Climate Change (IPCC), 2007 and the Stern (2007) report both demonstrate that the most important environmental problem of our age is global warming. CO2 is considered to be the primary greenhouse gas responsible for global warming, and its regulation has become an important intergovernmental issue (Talukdar *et al* 2001).

Therefore, a better understanding of the interaction between environmental pollution as measured by CO2 emissions and FDI inflows, should be the basis for making sound economic policies. This study therefore forges ahead based on the afore mentioned to investigate the impact of FDI inflows on CO2 emissions in West Africa and further decompose the environmental impact of FDI into composition, scale and technique effect.

Theoretical Literature

The **"**Pollution Haven Hypothesis" claims that countries with less stringent environmental regulations will attract pollution-intensive industries when they adopt trade liberalization policies. This hypothesis postulates that costs of production will be less in those countries with more lenient environmental standards, and as a consequence attract potential producers of pollution-intensive goods should such countries open up to free trade. The pollution haven hypothesis further asserts that governments in most developing nations are hesitant to place strict environmental standards on their firms in order to boost the competiveness of local firms in the global market. According to the pollution haven hypothesis, most developing countries experience deterioration in environmental quality when they open up to trade mainly as a result of ineffective environmental regulations (Busse, 2004).

As generally referred in works related to the issue of environmental effects of FDI, it is possible to observe how FDI does not affect the environment as an isolated phenomenon. On the consideration that it also interacts with various other factors, analysts have often developed their works by decomposing the environmental effects of FDI into technique, scale and composition (or structural) effects (i.e. He, 2008, 2006; Liang, 2006; Cole & Elliott, 2003; Grossman & Krueger, 1995, 1991). The technique effect is associated with the transfer and

diffusion of technology and/or the introduction of regulation. It refers to the change in the production method resulting from an economy's growth process which, among other things, can be induced by FDI inflow. The technique effect is almost always associated with the fact that, in a given country, the quantity of emissions per unit of considered goods produced or consumed depends on their production or consumption "techniques". Due to a mechanism of allocative efficiency among countries, which implicitly exists in the free movement of investment, liberalization can very likely change these techniques especially through policy and technological channels. In other words, the technique effect generally refers to the development, introduction and diffusion of new and more stringent environmental regulations and/or more efficient technologies, which are expected to exert a beneficial role on the environment.

The scale effect refers to the increase in the size of the economy[1]. It is generally expected to be detrimental for the environment since an increase in the size of an economy – which can also be the result of an economy liberalization process – implies more production and, in turn, more pollution. It must be pointed out, however, that the scientific discussion on the scale effect contains the Environmental Kuznets Curve (EKC) argument in itself. Although this is the subject of different views, the EKC highlights how the detrimental impact of an economy growth process can be verified up to a certain point. Afterwards, an improvement of the environmental condition can be observed as a result of the increased capacity of countries to adopt new and more efficient technologies as a result of their higher level of richness (e.g. Stern, 2004a, 2004b). Lastly, the composition (or structural) effect is associated with the change in the industrial structure of an economic system occurring as a shift in the pattern of economic activity. The environmental implication of this considered effect is generally expected to be beneficial to the environment on the assumption that the already mentioned free movement of investment encourages allocative efficiency among countries (OECD, 2001). As a result, for example, in a considered country a more polluting production sector might shrink and a less polluting expand. The outcome is that its total emissions will likely fall with a beneficial result for the environment. Other works, however, highlight how in a free trade and investment context, the expected sign of the impact resulting from the composition effect can be positive or negative depending on the productive specialization of a country. This, of course,

[1]Although theoretically different "technique" and "scale" effects appear very similar. They are quite difficult to separate especially in empirical analysis. The "scale" effect is identified by two variables contemporarily considered, namely the GDP per-capita and its squared computation. The same is done for the FDI variable.

depends on the country's competitive advantages, which can be characterized by opposite sources (Cole & Elliott, 2003).

Literature review

Empirical studies abound in the literature to explain the environmental effects of trade liberalization but not with focus on the West Africa Sub region. Investigating the relationship between Foreign Direct Investment (FDI) and the environment with focus on how FDI inflow to the "agriculture and fishing" sector of OECD countries exerts on Carbon dioxide (CO2) emissions level, Pazienza, (2015) shows the existence of negative relationships characterizing the technique (–0.0848), scale (−0.0036) and cumulative (–0.0044) effects of FDI on CO2. From an environmental-economic point of view, this outcome would mean that an increase of the considered type of FDI reduces the CO2 level and concluded therefore that, FDI plays a beneficial role in the environment. The findings of Blanco *et al* (2013) do not corroborate that of Pazienza (2015), when they found that for Latin American countries, FDI inflows in pollution-intensive industries can be linked to increases in CO2 emissions per capita and per unit of GDP. Omri et al (2014) posits that a 1% increase in FDI inflows raises the CO2 emissions by 0.19%, suggesting that FDI flows may have resulted in pollution havens and that lowering the environmental regulations may help to attract and retain foreign investments. Similar results are documented by, among others, Pao and Tsai (2010), Sharma (2011) and Mutafoglu, (2012). Antweiler *et al*. (2001) examined the relative strength of the scale, composition, and technique effects of trade on SO2 pollution in some selected major cities in the world using econometric analysis and concluded that free trade was good for the environment since a negative correlation was established between economic activity and concentration levels. They found the technique effect dominant over the scale effect. Specifically, a 0.25% increase in scale of production results in a 0.5% sulphur dioxide increase. However, for each 0.25% increase in activity the technique effect results in a 1.25% to 1.5% decrease in sulphur dioxide levels. Composition effect analysis revealed little significance regarding environmental consequences.

Using carbon dioxide emissions as proxy for the environment and FDI in developing countries, Talukdar *et al* (2001) found a negative significant relationship between FDI from developed countries and carbon dioxide emissions. Kheder (2010) observed a positive relationship

between French manufacturing FDI and pollution emissions in host countries, whether He examined CO2 air pollution or a more local water pollution. This damaging impact was more significant from most polluting FDI. He (2006) explores the relationship between FDI and the environment in China; he unearths evidence that an increase in FDI inflows results in deterioration of environmental quality. However, these studies implicitly assume a one-way causality from measures of environmental quality (SO@ and CO2 emissions) and/or economic growth (GDP) to FDI and adopt a structural model (i.e., reduced form equations) to estimate the impacts of FDI based on such causality. Ajide *et al* (2010) in studying FDI and the Environment in Nigeria suggests that carbon dioxide emission (a measure of environmental quality) moves pari passu with the inflows of foreign direct investment. This they attribute to the fact that the bulk of FDI into Nigeria are traceable to its oil industry, thus the damage emanating from activities such as oil exploration and production worsens the already deteriorating environmental quality. FDI, population density and manufacturing value added significantly contributed to carbon dioxide emissions (pollution) in Pakistan (Mahmood *et al* 2012).

Doganer et al, (2010) applying a structural model on a sample of 34 OECD countries, reports that trade liberalization leads to a significant reduction in air pollution in the study countries through an increase in the importation of environmental goods. Frankel and Rose (2005) used cross-country data to find out the effect of trade on a country's environment, for a given level of GDP. Results of their study for three measures of air pollution show that openness tends to reduce sulphur dioxide (SO2), nitrogen oxide (NO2), and particulate matter emissions.

Lee (2013) in analysing the contribution of FDI net inflows to clean energy use, carbon emissions, and economic growth showed that economic growth has a negative impact on CO2 emissions in the G20 and is statistically significant at the 0.01 level. However a bivariate panel regression in examining the direct effects of economic growth on CO2 emissions, revealed a positive relationship between economic growth and CO2 emissions. The conflicting results between the two regression models according to Lee indicate that the association between economic growth and CO2 emissions may be spurious if one fails to control for other variables. Twerefou *et al* (2015) argued that, increasing per capita income in Ghana has reduced emissions of carbon dioxide illustrating the technique effect that increasing wealth of the individual leads to improved demand for higher quality of the environment. Contrary to Lee (2013) and Twerefou *et al* (2015), is the work of Sharma (2011) who found a positive impact

of economic growth on CO2 emissions. Similarly Omotor (2015) empirically confirmed the environmental Kuznets curve for the ECOWAS region using environmental quality indicators of CO2 and Sulphur dioxide. Sbia *et al* (2014) argues that, foreign direct investment saves energy i.e. negative impact of foreign direct investment on energy consumption. These encouraging results could increase UAE's motivations to increase FDI flows without affecting energy consumption. Boopen *et al* (2011) hypothesized that the cost of degradation associated with GDP grows over time and concluded that the economic and human activities are having increasingly negative environmental impacts on the country relative to their economic prosperity (GDP growth).

The impact of an urban population on CO2 emissions is negative (Omri et al 2014), thus contrasting the view that the development of urbanization leads to degraded environmental quality (e.g., Duh et al., 2008; Kahn and Schwartz, 2008). Similarly, investigating the determinants of CO2 emissions Sharma (2011), found that urbanisation had a negative impact on CO2 emissions in high income, middle income, and low income panels. Population density in ECOWAS countries tends to intensify pollution from SO2 concentration more than any other sources in the estimations, suggesting deliberate policy intervention in urban planning (Omotor, 2015). Twerefou *et al* 2015 in investigating the impact of international trade on the quality of the natural environment in Ghana revealed that increasing urbanization negatively affects the natural environment through increased carbon dioxide emissions. The results indicate that in the long-run period, international trade has had adverse effects through the increased emissions of carbon dioxide as a result of increasing urbanization.

Considering the mutual relationships between FDI, environmental regulation and pollution, to confirm the pollution haven hypothesis in France, Kheder (2010) showed that environmental regulation exerts a negative impact on more polluting FDI as well as on less polluting FDI, with an expected stronger effect on more polluting one. Omotor 2015 re-echoed the gospel that the quality of public institutions matter in achieving environmental quality; in that deliberate and conscious choices of environmental policy efforts are required for cleaner environment as income per capita rises. Omri (2013) empirically showed a unidirectional causal relationship from energy consumption to carbon dioxide emissions without feedback. This implies that due to the expansion of production, MENA countries are consuming more energy, which puts pressure on the environment leading to more emissions.

Omotor 2015 postulates that trade openness positively impact on emissions with a coefficient greater than zero; implying a monotonically increasing trend connoting that increasing trade is accompanied by a rise in the level of the emission. This evidence gives credence to the pollution haven hypothesis which suggests that developing countries are the destinations for dirty industries or dumping sites of richer nations. A cointegration analysis showed that India had a positive, but marginal, long run impact of FDI inflow on GDP growth. On the other hand, though the pollution heaven hypothesis may not be a plausible argument for the upsurge in FDI inflow in the 1990s, such inflows did have a quite large positive impact on the CO2 emissions through output growth Acharyya, J. (2009).

Theoretical framework

The study adopts a model that allows for the decomposition of the environmental impact of FDI into scale, technique and composition effects. Below is a brief summary of the framework as developed by Antweiler *et al.* (2001). The model assumes a small open economy that produces two final goods *X* and *Y*, with two primary factors, Natural capital (*N*) and Human capital (*K*). It is assumed that the industry that produces *Y* is human capital intensive and does not pollute while the industry that produces *X* is natural capital intensive and generates pollution as a by-product of production. We assume constant returns to scale and hence the production technology for *X* and *Y* can be described by unit cost functions. Resting on the above, an emission function that links environmental pollution to economic activity as follows:

$$\mathrm{E} = eX = e\theta S \quad \ldots\ldots (1)$$

Where *e is the* pollution intensity of the dirty industry, is the share of *X* (pollution-intensive good) in total output, and S is the overall scale of the economy. Equation (1) therefore means that the overall level of environmental degradation (*E*) depends on the pollution intensity of the dirty industry *e*, the relative importance of the dirty industry in the economy, and the overall scale of the economy *S*. As shown by Antweiler *et al.* (2001), Equation (1) can be written in a differential form as denoted by Equation (2):

$$\hat{E} = \hat{S} + \hat{\theta} + \hat{e} \quad \ldots\ldots (2)$$

The hats defines percentage change. The first term on the right hand side of Equation (2) is the scale effect and it measures the change in environmental degradation resulting from an increase in the level of output. Thus, holding constant the mix of goods produced θ, and production techniques *e*, an increase in the scale of economic activity (output) is expected to increase

environmental degradation. The composition effect, the second term, measures the effect of a change in the output mix of the economy on the environment. Holding the scale of the economy and emission intensities constant, an economy that directs more of its resources to producing the pollution intensive good *X*, will pollute the environment more. The last term is the technique effect. Holding all else constant, a reduction in the intensity of emissions will reduce pollution.

Empirical estimation

Based on equation (2), I formulate equation (3) as the empirical model

$$\mathrm{E}_{it} = \alpha + \beta_i X_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Where E_{it} represents environmental degradation, X_{it} is a vector of independent variables - scale effect, composition effect and technique effect - β_i are the parameters to be estimated, μ_{it} is the stochastic error term which is initially assumed to be normally distributed with a zero mean.

The model to be estimated is specified in Equation 4 of the form;

$$CO_{2it} = \alpha + \beta_1 FDI_{it} + \beta_2 GDPPC_{it} + \beta_3 GDPPC^2{}_{it} + \beta_4 Haven_{it} + \beta_5 K/L_{it} + \beta_6 Polity2_{it}$$
$$+\beta_7 Popgrowth_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Variable specification

No.	Variable	Description	Source
1	CO_2	Carbon dioxide emissions (metric tons per capita)	WDI data
2	FDI inflows	Foreign direct investment, net inflows (% of GDP)	WDI data
3	GDPPC	GDP per capita growth (annual %)	WDI data
4	GDPPC2	Computed by squaring the GDP per capita growth variable	Authors computation on WDI data
5	Haven	The product of trade openness and real GDP per capita	Authors computation on WDI data

6	K/L	The ratio of gross capital formation and the total labour force	Authors computation on WDI data
7	Polity2	Ranges from -10 to 10 with higher values indicating increasing democracy	INSCR data
8	Pop growth	Annual growth in the population expressed as a %	WDI data

Borrowing from the work of Appiah – Konadu (2013) and Pazienza (2015), the study use per capita gross domestic product (GDP) as a proxy for income level to measure the scale effect, capital-labour ratio as a measure of the composition effect of trade, and FDI inflows as a percentage of GDP as a proxy for the level of economic activity and hence the technique effect. In addition to decomposing effects of FDI – induced CO2 emissions, the study introduces three more independent variables that can influence FDI effect on the environment, polity2, population growth and the pollution haven effect.

Analysis and Results

Summary statistics of the variables considered in the model.

Variable	Observation	Mean	Std. Deviation	Min	Max
Country	496	8.5	4.614426	1	16
Year	496	1995	8.953302	1980	2010
CO2 emissions	496	0.2960478	0.2533083	0.0445726	1.761085
FDI inflows	475	2.985324	10.01922	-82.8921	91.00733
GDPPC	488	0.4407809	8.079203	-50.23583	91.67289
GDPCC2	488	65.33406	420.9243	1.06E-07	8403.919
K/L Ratio	298	273.387	439.5685	-14.43869	4113.586
Haven	479	9.10E+07	6.99E+08	0	1.33E+10
Pop growth	496	2.664404	1.045834	-1.826202	7.83583
Polity2	496	-1.512097	5.490842	-9	8

Source: Author's computation

Before presenting the estimation procedures and results, the model specification is subjected to a few tests with the aim of checking it for heteroskedasticity, autocorrelation, stationary and

cointegration. A likelihood-ratio test for the null hypothesis of panel homoscedasticity, shows a *p*-value = 0.0000 which implies the existence of heteroskedasticity in the model. Autocorrelation is also checked and shows a *p*-value = 0.0000, which implies the presence of autocorrelation. To test for stationary, the Fisher Augmented Dickey Fuller and Phillips-Perron unit root test was run and the results is reported in the table below.

Summary of the Results of the ADF and PP Tests of Stationarity for Variables at the Levels

Variable Name	**ADF**	**PP**
CO2	-2.29589 (0.012)**	-2.87454 (0.002)***
FDI inflows	-3.69809 (0.001)***	-5.40444 (0.000)***
K/L ratio	-4.3914 (0.000)***	-10.0982 (0.000)***
GDPPC	-8.20702 (0.000)***	-14.1815 (0.000)***
Polity2	-1.56872 (0.05)*	-1.72136 (0.042)**
Popgrowth	-10.6142 (0.000)***	-2.24157 (0.013)**
Haven	-7.34305 (0.000)***	-12.8347 (0.000)***

Source: Author's computation

All the variables are stationary at levels so the study proceeded to use the Breusch – Pagan (LM) test for the choice between the OLS model over FE/RE performs. A *p* – value equal to 0.0000 makes us choose the FE/RE model over OLS. The Hausman test is then employed to decide whether the FE is more appropriate and vice versa. A probability value of 0.0049, fails to accept the null hypothesis of a random effect. The study then went ahead to estimate the robustness of the fixed effect model to attend to the problem of autocorrelation and heteroskedasticity. The results is reported in the table below;

Panel Fixed Effects Estimation Results

Explanatory Variable	**Parameter Estimate**	**T – Statistic**	**P value**
FDI inflows (Technique effect)	-0.0055325	-4.28	0.000***
GDPPC (Scale effect)	-0.00266	-1.96	0.051*
GDPPC2	0.0001703	3.34	0.001***
Polity2	0.0010782	0.55	0.580
Haven	-8.61E-11	-1.09	0.277
K/L (Composition effect)	0.0001124	2.11	0.036**

Pop growth		0.0065756	0.66	0.508
Cons		0.2594233	8.53	0.000***
Number of observation	293			
Number of groups	16			
R squared	0.1093			

Source: Author's Estimation

Note: ***, ** and * denote 1%, 5% and 10% levels of significance respectively and all values have been approximated to two decimal places.

The results from the panel fixed effects reveal a significantly negative relationship between CO@ emissions and FDI inflows for the West Africa sub-region. Showing a beneficial role of the considered investment flow for the environment since it highlights a decrease of CO2 in response to an increase of FDI. Corroborating the findings of Pazienza, (2015) the results show that increasing FDI inflows is very effective or beneficial in improving the environmental quality. This therefore means the increasing CO2 emissions is explain by other factors other than FDI. West Africa is therefore not a "dumping site" for dirty industries as the image is created out there. This contradicts the findings of Pao and Tsai (2010), Sharma (2011), Mutafoglu, (2012) and Omri et al (2014). The practical explanation of the environmental-economic meaning of these results would make us say that, with regard to the technique effect, a 1% increase of the FDI inflow generates a decrease of about 0.00553% of CO2 and this is significant at 1%.

The outcome of the study suggests that increase in economic growth improves the environmental quality through the decrease in CO2 emissions. This is consistent with the findings of Twerefou et al (2015) and Lee (2013) but contrast the findings of Omotor (2015) who found a positive relationship between CO2 emissions and growth in output. That is to say that initial increase in the wealth of individuals lead to better environmental conditions. Beyond the turning point however, further increase or higher levels of economic growth deteriorates the level of pollution. This can be attributed to the speed with which most West African countries want to catch up the developed world in terms of industrialization. This seem to assume that since the pollution from FDI's are minimal then local industries are the perpetrators of increased pollution. The study does not confirm the EKC. The FDI induced scale effect shows that a 1% increase in GDP per capita decreases CO2 emissions by 0.00266% and significant at 10%.

In line with the theoretical expectations the coefficient of the composition effect is positive and statistically significant meaning the FDI induced composition effect is detrimental to the depletion of forest resources in Ghana. The coefficient of 0.0001124 for the composition effect means that FDI-induced increase in the share of natural resource intensive goods in total output by one unit results in a rise in forest depletion by 0.01%. This is consistent with the findings of Appiah - Konadu (2013). The increasing CO2 emissions in developing countries can therefore be attributed to intensive use of capital relative to labour.

The magnitude of the adverse composition and favourable scale effects of FDI more than offset the benefit of the favourable technique effect and thus, making FDI detrimental to Carbon dioxide emission and hence detrimental to the environment.

Concluding Remarks

FDI to LDCs has increased over the last decades. As a result, academics and policy-makers are interested in determining the environmental effects of these flows. The study employed the panel fixed effect model to analyse the causal relationship between FDI and CO2 emissions in West Africa from 1980 to 2010 and provide insights on the environmental effect of FDI. Based on the results of the study, we can conclude that, that developing countries particularly West Africa is a dumping site for 'filthy corporations' is speculative (the study therefore did not prove the pollution haven hypothesis for West Africa). Policy should be directed at encouraging FDI's from cleaner industries under strict environmental regulations since the magnitude of the scale and composition effect offset the benefits of the technique effect. The capital-labour ratio was however positive and significantly impact on CO2 emissions. Similarly the EKC was not confirmed for West Africa as the results suggests that increasing wealth of individuals is efficient in curbing CO2 emissions; therefore, no comment can be made either on the technique effect and the scale effect or on the cumulative effect induced by GDP on CO2. Beyond the turning point however further increase in wealth does not order well for environmental quality. Governments in the ECOWAS region as a recommendation should intensify the ban on the imports of used home appliances. What is needed is a strict enforcement of this ban to totally curb the imports of such goods. It is also recommended that the government's imposes high taxes on the imports of used vehicles as well as any capital equipment to discourage their mass imports into their countries. Future research should be

directed at determining whether FDI pollutes more than locally owned firms, distinguishing the environmental effect of FDI by sectors is still a relevant task for policy-makers.

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