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Trade liberalization, FDI inflows economic growth and environmental sustanaibility in Pakistan and India

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Abstract: To explore the possible environmental and economic influences of FDI and Trade openness in Pakistan and India is the aim of this study. Especially this study investigates whether trade liberalization harms the environment of Pakistan and India or not. Panel ARDL model was conducted for both countries as a group. We found that FDI and CO_2 have a positive relation with each other in the empirical section which shows FDI of both countries could harm their environment. In long run, trade has negative correlation with the environment but in the short run it has a positive correlation. This study concludes that FDI and trade liberalization can boost the economy by creating job opportunities but they harm the environment in Pakistan and India.

Keywords: Trade liberalization; Foreign Direct Investment; Environmental Quality; Economic Growth

Introduction

The environmental and economic impacts of FDI inflows and trade liberalization have been attracting special attention of policymakers and scholars since few decades. We can say that the trade liberalization and FDI lead to an expansion of international activities in energy consumption and manufacturing. As resultant the consumption of energy increased extremely. Especially in developing countries, these factors increased the weaknesses of the ecosystem.

For sustainable economic growth in the world countries are taking steps to make open economy for investment and trade. There is no doubt that without being open to international world no country can achieve economic growth, success and improve the lifestyle of their people in recent years. So, increase in foreign direct investment inflows and trade openness are important elements for economic success in the competitive world.

In the manufacturing of some products, countries are opening up their boundaries for international trade and investment and developing competitive advantages. As countries open up their boundaries for international trade and investment number of people in absolute poverty are declining.

Countries like India, Pakistan Uganda, and Vietnam are experiencing more poverty reduction and faster economic growth from recent years due to opening up their economies (WDI). Those developing countries who lower their tariffs grow more quickly than those who do not globalize their economies.

In literature, numerous studies have focused on the potential impacts of foreign direct investment inflows and trade liberalization on environmental sustainability like pollution due to carbon dioxide emission, energy consumption etc. Researches reveal that foreign direct investment and trade liberalization could harm the environment on one side but trade liberalization and foreign direct investment inflows may reduce the use of energy due to introducing the latest technology. So according to these studies increase in trade and the increase in foreign direct investment might have positive as well as negative impacts.

To evaluate the impacts of trade liberalization and FDI on environment and growth several studies have analyzed the relationship between them. At the start, many researchers agreed that the increase in trade improves the allocation of resources at the domestic level. Some studies explained that the increase in trade reduced the pollution and use of resources efficiently. Some studies developed by important studies of (Singer 1950, Buckley and Casson, 2003, Tariq *et al.,* 2018) analyzed the FDI impacts on growth in receiving countries. There are a lot of studies on FDI and economic growth at micro as well as on the macro level. But the empirical results showing conflicting results (Hamdi and Sbia 2013).

Many studies explained that in host countries FDI can benefit economic growth through productivity efficiency, increase in capital and diffusion of old technologies with introduction of new technologies procedures and methods (Ming-Jia Li 2018, Borensztein, De Gregorio, and Lee 1998). The study of (Sbia, Shahbaz, and Hamdi 2014, Sun *et al*. 2018) explains that increase in trade replaced the old technology which consumes more energy with new technology which consumes less energy. The results from these studies explained that FDI indirectly promotes economic growth by dispersal of technology which increased the knowledge of labor by skill development programs, training, and new management practices (De Mello, 1999). Various studies did not get evidence for technology transfer horizontally. Hanson /92001) found weak positive effects of FDI for host countries. Lipsey (2004) showed in his study positive effects of FDI inflows in host countries.

In the existing literature, there is a lack of study on the impacts of FDI on the environment in Pakistan and India. So, this study will contribute to the existing literature by directing the attention to Pakistan and India. Pakistan and India

declared independence in 1947. The choice of these countries is justified for many reasons. For example there was not any previous study on trade liberalization, foreign direct investment inflows, environmental sustainability, and economic growth, India and Pakistan are part of SAARC which is the geopolitical union and regional intergovernmental organization of nations in South Asia, and all countries have the most important trade agreement in the same period and commercial policy undertaken by these countries shows similarity. World Development Indicators (WDI) is the main source of the data.

A few studies examined the association between CO_2, FDI inflows, trade and GDP in recent times. These empirical findings showed mixed results. Some studies said that CO_2 has positive effects with GDP some studies explained negative impacts some explained week relation between these variables. But this study is investigating the current impacts of trade openness and FDI inflows on the environment by considering the case of Pakistan and India. This study covers the time period from 1981- 2015. India is one of the most populous countries around the world.

The main aim of this study is to evaluate the environmental impacts of trade, FDI and economic growth in Pakistan and India. Specifically, this study will investigate whether the increase in trade and FDI harmed the quality of the environment in member countries in the long run and short run. To explain this study first we checked unit root in data then structural break unit root test and due to stationarity at first difference Panel ARDL model was used.

FDI inflows, trade liberalization, environmental sustainability and economic growth in Pakistan and India

Despite problems persisting between India and Pakistan political relations they propose to expand economic linkages with each other. It was observed that bilateral trade between India and Pakistan has increased from 47.15 crores in 1987 - 1988 to 463.92 crore in 1998-1999. Economic relations of Pakistan and India can be divided into trade between business communities which is conducted through governments. Nations have shifted emphasize from politics to economics in their foreign and domestic policies. This is obvious from North American Free Trade Area (NAFTA), European Union (EU) and Association of South-East Asian Nations (ASEAN). In India and Pakistan context role of SAARC (South Asian Association for Regional Cooperation) has gained the greater interest of leaders in the sub-continent to increase cooperation and trade. The SAARC member states signed an agreement SAPTA (South Asian Preferential Trade Agreement) at the SAARC summit Dhaka on 11th April 1993.

This agreement provided rules for the liberalization of trade between countries. Preferential trade agreement imposes a reduction of tariffs between members of

SAARC countries. The aim of this mutual cooperation is to lower the freight cost which results in cheaper prices and improve the quality of life and to promote the welfare of people. During the fifteenth summit, they renewed their resolve to improve economic growth and emphasized energy, climate change, telecommunication, poverty alleviation, transport, trade, food security, education, and tourism. Over Pakistan India definitely has a comparative advantage at present. Manufacturing and agriculture sectors both are more competitive and efficient than Pakistan. Indian economy is one of the best-subsidized economies in the world. At the same due to poor storage capacity, it has the highest food spoilage. So it needs an open market to present its agriculture which is surplus. But on the other side, Pakistan is facing the problem with high inflationary pressure. Pakistan is struggling to remove energy crisis and corruption. The textile sector should be major importer due to competitiveness and efficiency in the world.

On the regional economy, agribusiness and food sector has a significant impact on the economy of both countries. Even fast from the power sector and telecom among various industries this industry has one of the highest economic effects. According to one estimation trade in the agri sector could make jobs around 2.7 lacs in India and 1.7 lacs in Pakistan due to trade liberalization in Pakistan and India. Being agrarian economies both countries Pakistan and India could collaborate in the agriculture sector. Because the agriculture sector is an essential element of the large employment sector and GDP in their economies. So for the mutual advantage of Pakistan and India, both countries have to cooperate in areas of common interest. FDI of India was 91920000 in 1981 and reach 44208019071.77 in 2015, for Pakistan FDI was 108084748.50 in 1981 and 979000000 in 2015. During 1981 to 2015 the number of firms and investment increased every year. It is worth noticing that investment is in form of services, manufacturing or in energy. We can also say that FDI in different years has also decreased due to risks, uncertainty and terrorist attacks.

Trade openness and foreign direct investment have a vast magnitude in each sector. Krueger (1978) and Bhagwati and Srinivasan (1983) stated that trade openness improves knowledge in industries which lead to improving the productivity in long run. (Antweiler, Copeland, and Taylor 2001a) said that growth in manufacturing exports leads to an increase in absorptive capacity which raises economic growth. Dollar and Kraay (2003) examined the relationship between institutions and trade openness on economic growth and stated that with better institutions more open economies develop faster and trade in countries will increase with better institutions. Human capital formation tends to increase the positive effect of trade liberalization on economic growth (Edwards 1991) and (Villanueva 1994).

Literature review

During the past few years policymakers and scholars have a great interest in the relationship between FDI inflows, increase in trade, growth, and environmental

sustainability. This relationship is classified into three categories in earlier studies (Papageorgiou, Michaely, and Choksi 1991). Scale effect is the first category in which it is supposed that trade openness rouses the level of production and domestic consumption this improve the economic activity. The technical effect is the second category which explains that due to trade liberalization opportunity to transfer the advanced technology improved which reinforce the environmental sustainability.

Composition effect is the third category which says that trade has the impact on modification of economic structure. Empirical and theoretical both researchers provided conflicting and same evidence that trade has the effect on economic growth and environment. Those authors who are in favor of this theory that trade liberalization has the positive effect on economic growth said that trade attracts the international traders to invest in the country and improves the transfer of knowledge between rich and poor countries. Campos and Kinoshita (2002) found that FDI in form of reassigned technology has the significant and positive effect on growth. In a cross-country regression framework Borensztein, De Gregorio, and Lee (1998) used data of 69 developing countries over the period of 1970-89 tested the impacts of FDI on economic growth. They said that through upward of technological progress FDI has positive effects on economic growth. Similar results were found by many researchers. The study by Parikh and Stirbu (2004) investigated the relationship between trade balance, trade liberalization and economic growth.

This econometric approach used panel data and concludes the positive relationship between economic growth and trade liberalization. Earlier studies by (Papageorgiou, Michaely, and Choksi 1991, Grossman and Krueger 1991) and (Wacziarg and Welch 2008) the link between economic growth and trade liberalization. These studies explain the results that those countries which liberalized their trade have 1.5% higher growth rate than before liberalization. Oladipo (2011) used data from 1980-2008 with the econometric method using an error correction model. His empirical results suggested that economic growth is dependent on FDI and trade openness. Shahbaz *et al.* (2015) used the ARDL bounds testing approach and tested the long run effect of trade openness on growth in Pakistan and results were similar.

However, some studies have contrast results that FDI has a negative or weak relation with economic growth. For example Yanikkaya (2003) used panel data over 1970-1997 of 100 developing and developed countries to investigate the relationship between trade liberalization and economic growth. He used Ordinary least square (OLS), three stages least square (3SLS) and seemingly unrelated regression (SUR) and concluded weak relation between economic growth and trade openness. Eriș and Ulaşan (2013) used Bayesian Model Averaging techniques (BMA) to check for the association between economic growth and trade liberalization and results indicate that there is no a direct relation between trade openness and economic growth. Menyah, Nazlioglu, and Wolde-Rufael (2014) used data from 21 countries ranging

from 1965-2008. They explained in their results that trade liberalization and financial development could not have the major impact on economic growth. Paudel (2014) used data from 193 countries from 1985-2010 and he said economic development of each country impacts of trade liberalization on economic growth is different. Study on Nigeria choose data from the year 1970-2011, they concluded that policies of trade liberalization do not disturb the economic growth. Study on Bangladesh Manni and Afzal (2012) used data from 1980-2010 they said that trade liberalization and economic growth has positive relation but this liberalization does not have the impact on inflation. (Greenaway, Morgan, and Wright 1997) said in their research that trade liberalization decreased the level of economic growth.

From last two decades impacts of trade liberalization on the environment has become a most important issue. But the literature on trade liberalization and the environment is limited. Some environmental economists (Grossman and Krueger 1991, Selden and Song 1994, Panayotou 1993, Antweiler, Copeland, and Taylor 2001b, Ferrantino and Linkins 2003) suggested a positive relationship between environmental policies, trade openness, and economic growth. The researchers who are in favor of this view explain that openness in trade improves the transfer of technology and knowledge and improves pollutant and old industry to new and clean industry. Moreover, they said that higher standards of the environment are imported to countries which are developing. However, ecological economists like (Cole, Rayner, and Bates 1997, Lopez 1997, Strutt and Anderson 2000) gave another opinion. They criticized and said that trade openness generates negative environmental sustainability when developed countries do business in those host countries which have dirty industries. Taskin and Zaim (2001) did their study on 50 countries ranging from 1970-1990. They used the econometric approach in which they investigated the impacts of trade openness on environmental sustainability. They found that the degree of openness to trade has positive effects on environmental sustainability. Feridun, Ayadi, and Balouga (2006) did study on Nigeria and have applied GLS approach to investigate the impacts of trade liberalization on the environment.

Pollution is positively related to trade and real GDP per square kilometer, while capital to labor ratio and GNP are negatively related to pollution were empirical findings of their study. Antweiler *et al.* (2001) used data from 43 countries over the period of 1971-1996, they investigated trade liberalization effects on pollution. They found that an increase in trade reduced the pollution. Chang (2015) used data of 51 countries ranging from 1997-2007 and he found in his study that the increase in trade results in the increase in CO_2 emission. Aller, Ductor, and Herrerias (2015) used data of 96 countries over the period of 196-2010, they indicated in their research that trade improves the quality of environment in low-income countries and reduces the quality of environment in high-income countries. Shahbaz et al. (2013) did their study on Malaysia over the period of 1970-2011 and they found that an increase in trade improves wealth and also increase energy consumption. Damania, Fredriksson,

and List (2003) employed panel data of 30 countries over the period of 1982-1992. They argued that impacts of trade openness are depend on the corruption level. (Managi, Hibiki, and Tsurumi 2008) did the most recent study in which they used carbon dioxide (CO_2) emissions and sulfur dioxide (SO_2) emission of 88 countries ranging from 1973-2000 and biochemical oxygen demand of 83 countries over the period of 1980-2000 to inspect the effects of trade openness on the environment. They applied the GMM method to investigate the results and concluded that the effects of trade are different from country to country.

The Pollution Haven Hypothesis (PHH) states that nations with large industries pursue to start factories in abroad, they mostly look the cheapest countries where the cost of environment is lowest because nations with strict environmental policies and regulations can be more expensive to meet the environmental standards. (Gill 2018) stated that due to foreign direct investment (FDI) and international trade the developing countries have become the pollution haven for the large industrialized nations. Cole (2004) investigates the Pollution Haven Hypothesis by using North-South detailed data and described if pollution havens have made they are expected to have been temporary and limited to certain regions and certain sectors. Solarin et al. (2017) investigated the Pollution Haven Hypothesis in Ghana and came out with the conclusion that foreign direct investment (FDI), Gross Domestic Product (GDP), financial development, international trade, and urban population have the positive influence on CO_2 in Ghana.

This specifies that the Pollution Haven Hypothesis (PHH) exist in Ghana. As Pakistan and India are developing countries and have less environmental regulations thus they attract more foreign direct investment and trade. It is worth noticing that there was not any study related to FDI inflows, trade liberalization, economic growth and environmental sustainability in Pakistan and India in literature. So we are trying to fill this gap.

Empirical Analysis

Data and Statistics

To determine the case of Pakistan and India we used income (GDP), trade, FDI inflows, CO_2 emissions as a proxy for environmental standards and Capital (K) in this study from the year 1981-2015. The selection of time period, countries, variables in the econometric model and results are purely based on the availability of data. Description about variables is given in table 1. GDP is used as the proxy for income. K is used form Capital and CO_2 is used as the proxy for the environment. Trade is used for level of openness.

Table 1 - Source and description of data

VARIABLES	DESCRIPTION	DATA SOURCE
GDP	GDP growth (annual %)	World Bank (2017)
CO2	CO2 emissions (kt)	World Bank (2017)
Trade	Trade (% of GDP)	World Bank (2017)
FDI	Foreign direct investment, net inflows (BoP, current US$)	World Bank (2017)
K	Gross fixed capital formation (constant 2010 US$)	World Bank (2017)

Table 2 - Descriptive statistics

VARIABLES	MEAN	MAXIMUM	MINIMUM	S.D	OBSERVATION
lCO2	12.56569	14.52588	10.44582	1.262575	70
lGDP	26.00437	28.37854	24.05906	1.236534	70
lTrade	3.375802	4.020925	2.485629	0.4040921	70
lFDI	20.65613	24.51217	15.54539	2.073145	70
lK	24.81333	27.32013	22.97124	1.313124	70

The study covers from the year 1981-2015. World Bank is the main source to provide data. We transformed all the variables into the log. In table 2 descriptive statistics are presented and in table 3 correlation matrix are presented.

Table 3 - Correlation Matrix

	lCO2	lgdp	lfdi	ltrade	lk
lCO2	1.0000				
lgdp	0.9627*	1.0000			
	0.0000				
lfdi	0.6277*	0.7298*	1.0000		
	0.0000	0.0000			
ltrade	-0.0717	0.0780	0.6219*	1.0000	
	0.5553	0.5209	0.0000		
lk	0.9806*	0.9564*	0.6729*	0.0677	1.0000
	0.0000	0.0000	0.0000	0.5775	

Table 3 is showing the correlation matrix of five variables. It shows that $CO_2$and GDP has a positive correlation with each other, FDI and CO_2 are positively correlated with each other and CO_2 and trade is negatively correlated with each other. CO_2 and Capital (K) are also showing positive relation with each other. These results are showing the relationship between variables. That as foreign direct investment increases carbon dioxide also increases. As GDP increases carbon dioxide also tend to be higher. As trade increases, carbon dioxide decreases. This is due to different situations for example due to latest technology etc. And as capital goes higher in turn CO_2 also be higher than before. To explain these relationships further we used different tests which are described below.

We can consider the long run relationship between CO_2, FDI inflows, trade openness, GDP and capital (K) in linear logarithm form by following the literature.

$$\ln CO_{2_{it}} = \alpha + \alpha_1 \ln FDI_{it} + \alpha_2 \ln trade_{it} + \alpha_3 \ln GDP_{it} + \alpha_4 \ln K_{it} + \mu_1 + \alpha_1 + \varepsilon_{it} \text{ (I)}$$

In above model CO_2 is CO_2 emissions (kt), FDI is Foreign direct investment, net inflows (BoP, current US$), trade is Trade (% of GDP), GDP is GDP (current US$), K is Gross fixed capital formation (constant 2010 US$), subscript t represents time, i represent the recipient country μ_1 and α_1 represents fixed effects and ε_{it} is a residual.

The aim of this study to analyze long run and short-run relationship between CO_2, trade openness, FDI inflows, GDP and capital. It requires two basic steps. To check variables unit root and confirmed the stationarity of each variable is the first step of the analysis. This is done by use of Phillips and Perron (PP), Augmented Dickey Fuller (ADF) and Im - Pesaran-Shin (IMS) Panel unit root test. To check structural breaks Clemente – Montanes – Reyes unit root test was applied. The other step is to run panel ARDL model when 4 out of five variables are integrated of order I (1). In this step, short run and long-run relationships between variables were identified.

ARDL Model

In this study the ARDL model for error correction and to investigate the relationship between variables in Pakistan and India was applied. Panel analysis was used for this study. ARDL allows investigating the long run and short run relationship. For which procedure is specified as below:

$$\Delta 1CO2_{it} = a_1 + \sum \beta_1 \Delta 1CO2_{it} + \sum \beta_1 \Delta 1FDI_{it} + \sum \beta_1 \Delta 1Trade_{it} + \sum \beta_1 \Delta 1GDP_{it} + \sum \beta_1 \Delta 1K_{it} + \eta_i + \delta_t + \mu_{1i} \text{ (Eq.1)}$$

$$\Delta 1GDP_{it} = a_2 + \sum \beta_{2i} \Delta 1CO2_{it} + \sum \beta_{2i} \Delta 1FDI_{it} + \sum \beta_{2i} \Delta 1Trade_{it} + \sum \beta_{2i} \Delta 1GDP_{it} + \sum \beta_{2i} \Delta 1K_{it} + + \eta_i + \delta_t + \mu_{2i} \text{ (Eq.2)}$$

$$\Delta 1FDI_{it} = a_3 + \sum \beta_{3i} \Delta 1CO2_{it} + \sum \beta_{3i} \Delta 1FDI_{it} + \sum \beta_{3i} \Delta 1Trade_{it} + \sum \beta_{3i} \Delta 1GDP_{it} + \sum \beta_{3i} \Delta 1K_{it} + + \eta_i + \delta_t + \mu_{3i} \text{ (Eq.3)}$$

$$\Delta 1K_{it} = a_4 + \sum \beta_{4i} \Delta 1CO2_{it} + \sum \beta_{4i} \Delta 1FDI_{it} + \sum \beta_{4i} \Delta 1Trade_{it} + \sum \beta_{4i} \Delta 1GDP_{it} + \sum \beta_{4i} \Delta 1K_{it} + + \eta_i + \delta_t + \mu_{4i} \text{ (Eq.4)}$$

$$\Delta 1Trade_{it} = a_5 + \sum \beta_{5i} \Delta 1CO2_{it} + \sum \beta_{5i} \Delta 1FDI_{it} + \sum \beta_{5i} \Delta 1Trade_{it} + \sum \beta_{5i} \Delta 1GDP_{it} + \sum \beta_{5i} \Delta 1K_{it} + + \eta_i + \delta_t + \mu_{5i} \text{ (Eq.5)}$$

ect is the error correction term which is expressed as follow:

$$ECT_{it} = \ln CO_{2it} - \alpha_1 - \beta_1 \ln GDP_{t-i} - \beta_2 \ln Trade_{t-i} - \beta_3 \ln FDI_{t-i} - \beta_4 \ln K_{t-i} \quad \text{(Eq.6)}$$

Results

In this study Phillips and Perron (PP), Augmented Dickey Fuller (ADF) and Im - Pesaran - Shin (IMS) Panel unit root test to identify that variables contain unit root or not and confirmed the stationarity of variables at first difference. Results of these tests are presented in Table 4. Which shows that log values of FDI, trade, K are insignificant statistically and after taking first difference of all the variables they rejected the null hypothesis.

Table 4 - Panel Unit Root Test

Variable	PP		IPS		F-ADF	
	Level	*1st diff*	*Level*	*1st diff*	*Level*	*1st diff*
lCO₂	16.3691***	33.5884***	-1.8965**	-1.6056**	12.6319**	9.61251**
lTrade	3.0749	79.1108***	1.0300	-3.3455***	1.1967	22.1686***
lGDP	0.0182	49.6065 ***	4.0829	-3.2716***	0.0203	21.6321***
lFDI	1.4243	52.1088***	0.2900	-7.0319***	2.4808	64.7490***
lK	3.1490	42.2942***	1.8051	-2.9026***	0.9677	17.7792***

*Note: *** indicates 1%, ** indicates 5% and * indicates 10% confidence interval.*

It is also known that PP, ADF and IMS tests do not have structural breaks. As e know Pakistan and India experienced a lot of burst and boom from previous years and have applied numerous procedure and policy reforms. ADF, IMS, and PP might not provide consistent results. So, this study include an unknown breakpoint to overcome this problem that can be determined from data. So, this study applied a unit root test which allows two unknown structural breaks named as Clemente – Montanes – Reyes unit root test.

The Clemente – Montanes – Reyes unit root test results are presented in table 5. The AO (Additive Outlier) shows that the null of a unit root cannot be rejected for the variables under study. It is also noticing that Additive Outlier has diverse structural breaks due to policy implications. AO shows that at level variables have a unit root and these variables are stationary at first difference with the presence of structural breaks.

Table 5 - Clemente Montanes Reyes structural break Unit root test

Country	Variable	AO			*IO*		
Pakistan		*t-statistics*	*TB1*	*TB2*	*t-statistics*	*TB1*	*TB2*
	LFDI	-4.376***	1989	2003	-4.485	1990	2002
	LK	-3.699***	1991	2002	-5.317	1988	2003
	LCO2	-3.256***	1991	2003	-4.138	2002	2008
	LTrade	-3.881***	1998	2002	-3.673*	1998	2003
	LGDP	-5.157*	1990	2008	-4.473	1991	2004
India	LFDI	-3.877***	1993	2005	-3.393	1983	1990
	LK	-2.861***	1996	2006	-5.293***	1993	2002
	LCO2	-2.961***	1992	2006	-3.826***	1983	2004
	LTrade	-3.737***	1992	2003	-3.336	1987	2001
	LGDP	-4.292	1989	2000	-2.043	1990	2001

*Note: *** indicates 1%, ** indicates 5% and * indicates 10% confidence interval.*

The lag lengths under VAR (Vector Auto Regression) method was sellected. This criterion shows optimal lag length is five. This study also used time series unit root test by using ADF and PP. The results of these tests are presented in table 6. In this table, it is shown again that the log of FDI, K, CO_2, and trade are statistically insignificant. But when to apply the time series unit root test on first difference of these four variables they rejected the null hypothesis at 1 percent. So from this test, it is shown that these variables are integrated of order 1.

Table 6 - Time series unit root test

Country	Variable	ADF		PP		Order of Integration
Pakistan		*Level*	*1st Diff.*	*LEVEL*	*1st Diff.*	
	lGDP	-3.820***	-7.947***	-19.333***	-37.368***	I(0)
	LFDI	-1.333	-4.723***	-3.060	-26.311***	I(1)
	LK	-2.291	-4.140***	-2.938	-22.913***	I(1)
	LCO2	-3.814***	-5.066***	-1.609***	-37.717***	I(1)
	LTrade	-2.290	-8.024***	-12.787	-45.176***	I(1)
India	LFDI	-0.786	-6.171***	-0.885	-30.048***	I(1)
	LK	0.605	-5.681***	0.248	-36.374***	I(1)
	LCO2	-1.685	-4.171***	-0.580	-25.359***	I(1)
	LTrade	-0.043	-5.655***	-0.094	-34.666***	I(1)
	lGDP	-5.201***	-9.835***	-31.506***	-43.107***	I(0)

*Note: errors are presented in parentheses. *** indicates 1%, ** indicates 5% and * indicates 10% confidence interval.*

Table 7 - Long-run elasticitiest

CO_2 is dependent variable		
Variable	Coef.	Z- value
lFDI	0.1548034	1.92**
lGDP	-0.2221508	-131.19***
lTrade	-0.6600272	-1.07
lK	0.5700659	6.81* **

*Note: errors are presented in parentheses. *** indicates 1%, ** indicates 5% and * indicates 10% confidence interval.*

As the model is expressed in log-linear form the coefficients can be assumed as elasticities. From this approach, results show that the coefficient of capital (lK) is positive and significant, which shows that in long run capital contribute to CO_2 emission. As people invest more and more capital in business this will produce more output which in turn increase CO_2 which cause environmental degradation in long run. The coefficient of income (GDP) is negative and significant at 1 percent. Which shows that a 1 percent increase in income can decrease in CO_2 emission in long run. This reveals that at the initial stage of economic growth CO_2 emission decreases and more growth leads to less CO_2 due to the increase in business and job opportunities which cause environmental degradation or environmental instability. This result is consistent with (Ang, 2007) in the case of France (Taskin and Zaim 2001) for BRIICS countries. The coefficient of trade is negative but not significant. Which shows that in long run increase in trade lead to environmental sustainability. This is consistent with the (Sbia, Shahbaz, and Hamdi 2014) explains that the increase in trade replaced the old technology which consumes more energy with new technology which consumes less energy. This cause less environmental degradation in long run.

The coefficient of FDI is positive and significant at 1 percent. Which means the increase in foreign direct investment in long run cause environmental degradation due to increase in industrial areas which cause increase in CO_2 emission in the environment. Results of FDI are suggesting that FDI of both countries are polluting the environment.

In table 8 short run results are displayed where CO_2 is the dependent variable. In short run, results show that the coefficient of GDP is positive and significant at 1 percent to CO_2 emission. This reveals that increase in income can decrease environmental sustainability in short run of both countries this is consistent with the results of (Lee and Chang 2009, Menyah, Nazlioglu, and Wolde-Rufael 2014, Narayan and Narayan 2010).

Table 8 - For short-run elasticities

CO_2 is dependent variable		
Variable	Coefficient	Z- value
lFDI	0.00344	0.31
lGDP	0.0133748	0.30
lTrade	0. 0593028	2.07**
lK	-0.0557018	-12.40***
ECT	-0.1669066	-4.19***

*Note: errors are presented in parentheses. *** indicates 1%, ** indicates 5% and * indicates 10% confidence interval.*

Conclusion and Policy Implications

In order to examine whether several policies in trade and FDI sector in Pakistan and India could boost economic growth or not is the purpose of this research. Foreign direct investment and trade liberalizations are important issues and the great source of economic growth. Because trade and investment increased employment which ultimately increased the economic growth of selected countries. As Pakistan and India are declared as emerging economies and attract most of the foreign investments and trade due to liberalizing their economies. Particularly this study is interested to find the impact of trade on the environment. Instead of the political issue between Pakistan and India, they share multiple socioeconomic areas. In analysis panel data was used for both countries form the year 1981 – 2015. The analysis was purely based on the availability of data.

In the empirical section ARDL model was used to investigate short run and long results. Unit root test was conducted and confirmed the stationarity of data at the first difference. In ARDL it was found a positive relation between FDI and CO_2 in the long run as well as short run. Which means the increase in foreign direct investment inflows also increases CO_2 which cause environmental degradation. Which shows FDI in both countries is not clean FDI. Realizing the risks of environment government should take several policy implications to overcome these issues. Trade openness is positively correlated with CO_2 in short run but negatively correlated in the long run which may harm the environment but in long run, it has negative correlation it means the increase in trade in long run decreases the environmental degradation due to use of efficient technology which emulates less carbon dioxide emissions in the environment. Which shows the increase in trade liberalization increases CO_2 in the short run but increase in trade decreases CO_2 emissions in long run. GDP and CO_2 have a positive correlation with each other in short run as well as in long run. Which can explain it as GDP increases CO_2 emission in the environment increases because of more chances of jobs increases due to the increase in FDI inflows which in

turn harm the environment in a negative way. Therefore this study recommends the policymakers of both countries to promote green FDI and trade liberalization for the wellbeing of their citizens by giving more devotion to dramatic concerns of FDI and trade to decrease the CO_2 in the environment. Countries can get benefit most from liberalizing their own markets than access to markets of other countries. Liberalizing their agricultural markets industrial countries can get the main benefits. Some developing countries by liberalizing their economy would gain from agriculture and manufacturing.

Low-income countries can get benefit from industrial countries by liberalizing their agriculture sector in those countries agriculture has importance. It is necessary to know the elasticity of production of each product and know which the dirtiest good is, this is the simple way to assess the possible impacts. It is implied from the results that cost of economic growth and carbon dioxide can be reduced by the use efficient technologies and with the help of improvement of financial sectors which import environment-friendly technologies from developed countries which may lesser harm the environment. Both countries have to invest in green energy to get benefits from FDI and trade in long as well as short run. As a result, this green energy will attract more investments from abroad.

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