Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.6, No.9, 2015
www.iiste.org

An Empirical Research on Trade Libralization and Co_2 Emission in Pakistan

SUMMAIYA SALAM
Department of Economics,Institute of Management Sciences
1-A, E-5, Phase-7, Hayatabad, Peshawar-Pakistan.
E-mail summiya-khan4@hotmail.com

ABDUL SATTAR
Department of Economics,Institute of Management Sciences
1-A, E-5, Phase-7, Hayatabad, Peshawar-Pakistan.
E-mail abdul.sattar02@yahoo.com

Syed Waseem Gilani
Department of Economics,Institute of Management Sciences
1-A, E-5, Phase-7, Hayatabad, Peshawar-Pakistan.
E-mail syedgilani2007@gmail.com

Abstract
This article examines the impact of carbon dioxide emission on trade liberalization in Pakistan. For this purpose we have used secondary data from 1980-2010. The variable were taken as CO_2 emission and openness of trade. Granger causality test was applied to analyze the dynamic relationship between variables under study. Empirical results show that bi-directional causality is running between openness of trade (OT) and carbon dioxide emission (CO_2).

Chapter 1. Introduction

1.1 Introduction

Developing countries are facing a lot of problems and as we all that Pakistan being the developing country is also facing a lot of problems. Environment which plays an important role in the development of a country is adversely affected from the industries and factories that emit pollution. Pollution is not good for the health of the people living in this state; many diseases are being caused by the pollution such as cancer, asthma, immune diseases and lipus. It is very harmful for the health. It can kill human organisms. The human wants and needs are increasing day by day. Due to trade liberalization the production and consumption of products have expanded the imports and exports worldwide. It is due to trade liberalization that the number of industries and factories has also increased which produce pollution such as CO_2 which is harmful for the environment.

CO_2 is greenhouse gas emitted from human activities. It is present in the atmosphere as part of Earth's carbon cycle.CO_2 emission are caused by most of the natural sources all such emissions are due to the increase in pollution in the atmosphere since industrial revolution. Trade liberalization or trade openness is basically the removal of trade barriers, tariffs and non-tariffs obstacles.

Pollution levels are affected due to openness of trade and as a consequence the international trade is greatly affected. In order to deal with theoretical model the impact of trade on pollution is classified in three effects (scale, composition and technique effect) and then the data on sulphur dioxide concentration of Global monitoring Project is applied using this theory. It is very useful method of decomposing the trade effect in scale, composition and technique effect. (Gross man and Kuiger 1993).

According to Duy that beside trade has affected impact on trade and economic growth there still exits the nations value I-e; developing and develop. In this paper he refers these countries as poor and rich depending on their production performance. From international trade theory which says that poor countries are abundant in labor and natural resource as compare to the rich countries that are abundant in capital and capital intensive products. Through trade the rich countries produce more capital products and the wastes are shifted to the poor countries because the of the investment factor. Rich countries invest more on garbage disposal while the poor do not do the same. As a result they are worse off and their GDP decreases more due to environmental degradation. Therefore, the environment seems to clean in the rich countries, but

Degrade in the poor countries.

In the above two paragraphs on one side it has been indicated that pollution is affected due to openness of trade and three basic levels has been classified for the development of a theoretical model whereas on the other hand it has been explained that it does not only affect environment but the economic growth has also been affected in the developing as well as developed countries. And it is due to trade that the rich countries become more efficient in capital products where as other things are shifted to the poor countries as a consequence they

are not better off and their GDP also starts declining. The environment in the rich countries is much more clean from pollution and is opposite in the poor countries.

According to Choi et al (2010) the quality of environmental goods are considered as normal goods it clearly indicates that when the profit that we get from free trade rises the demand of a single person for better environmental quality also increases. The industrialization is conducted by environmental issues and at this particular stage the increased income is granted for environmental problems. Pollution seems to decrease when GDP increases and exceeds a specific level and because of this an inverted U-shaped relation is observed between GDP per capita and pollution. EKC is basically the U-shaped relation between GDP per capita and certain other factors of pollution

In different areas the relation between U shaped and two variables explains a nonlinear relation.

CO_2 gas is basic part of greenhouse gas emission and is a basic environmental problem. And it is really necessary to observe the casual relation between environmental pollution, trade liberalization and economic growth. It has been suggested that economic growth plays an important role in improving the quality of environment.

It has been mentioned in Kuik and Gerlagh (2003) paper that in The Urguary Round 1994 two policies for climate change and trade liberalization has been suggested. Home production and consumption pattern can be changed by reducing the emissions in Annex-I countries but they will strike the economies of other countries as well such as change in trade and investment flows. When the reduction of emissions such as CO_2 and other greenhouse gases will be recommended then energy use is suspected to move from Annex-1 to non-Annex-I countries. Carbon dioxide emission will increase because of redistribution of energy abundant production. This is known as Carbon leakage effect.

Pollution seems to decrease when an increase in GDP is observed and U-shaped relation is seen between GDP per capita and pollution. Where as in the other case domestic production and consumption pattern faces variation and a shift is observed in energy from Annex-I to non Annex-I countries. Carbon leakage effect has been explained in this scenario.

1.2 Background of the Study

Pakistan is a country of 179 million populations and is ranked on number 8^{th} out of 10 most effected countries by pollution. In our country we are trying to check the relation between carbon dioxide emission and trade liberalization. If their relation exists for short term period or long term period. It has been noticed that their relation exists for long term period and is positive in that period depending on the EKC inverted U-shaped model .CO_2 is responsible for polluting the environment and it has almost caused about 60% of the greenhouse effect . Economic growth of a country is also related to the emission it is assumed to be high if the carbon dioxide emission is at higher level. In 2010, CO_2 emission and energy consumption were 8.1 and 8.5 times higher as compared to the record of 1972. (Statistical review of world energy). The industries in Pakistan emit a lot of pollution because of which many sectors are affected.

1.3 Objective of the Study

The objective of my research is to examine the casual relationship between carbon emission and trade liberalization.

1.4 Research Question

What is the effect of CO_2 emission on trade liberalization in Pakistan?

1.5 Hypothesis:

H0: CO_2 does not granger cause the openness of trade
H1: CO_2 does granger cause the openness of trade (OT)
HO: OT does not granger cause the CO_2
H1: OT does granger cause the CO_2

1.6 Organization of the Study

This paper consists of five chapters. Chapter 2 is literature review which tells us how different people have approached to this topic. Chapter 3 includes Methodology, the dependent independent variables has been mentioned the econometric model that has been applied. Chapter 4 includes the analysis and interpretation of the model. Chapter 5 i.e. conclusion, what we have concluded from our research and it also includes the policy recommended from our research. At the end of all these chapters the references has been given.

Chapter 2. Literature Review

In literature review would examine the connection between openness of trade and its impact on CO_2 emission

investigated by various researchers. Different studies have examined the effect of openness of trade which include import, export and FDI inflow on CO_2 emission, the problem is distant from developed in view of the various conclusion reached. These studies have done for the reason to discover the causal link between the CO_2 emission and openness of trade. CO_2 emission has investigated and assessed in different aspects in the past studies. In this literature review different studies included on CO_2 emission in Pakistan related to openness of trade including imports, exports and FDI inflow.

Corong (2008) carried out a study in Philippines to examine the impact of carbon on its economy and the living standard of its residents. The main focus here is on policy implementation of carbon tax which is recommended by most of the economists for trade Liberalization program. This policy would also reduce the poverty faced by the people over there and it would ultimately increase the wealth of the people the living standard of the people would be improved. Data has been collected from the household in Philippines and CGE (computable general Model) has been developed which was proved very successful as it broke the country's economy into 35 producing sectors involving different agricultural, energy and manufacturing sector. For reducing the carbon emission 4 policy simulation were followed. When the tariff reduces the poverty also decreases while the wealth of the people increases. In the end it has been clearly indicated that if carbon tax is imposed during trade liberalization it may satisfy both economic and environmental objectives of the country.

Antweiler et al (2001) investigated the environment if trade is suitable for the environment or not. Effects of pollution on the environment has been observed here. A theoretical model has been developed in which trade effects are divided on pollution into scale, technique and composition effects. The data has been taken from these to observe the impact and it has been concluded that trade does not affect pollution badly it does not bring any drastic changes in the concentration of pollution. The approach used here shows transparency, simplicity and explicitness.

Managi et al (2008) examined the relation between trade openness, economic development and environment. Income and trade has been taken as endogenous variables and the quality of environment is being observed if it is affected by trade openness. Change in long and short run has been observed but the change observed in long run is more. According to Antweiler (2001) has used 3 effects, Scale effect which refers to change in production means higher level of production on emissions. Technique effect refers to negative impact of income on emission intensity where composition effect indicates how emissions are being effected by composition. Dynamic model has been used here. Openness to trade seems to have both positive and negative effect on the other hand trade seem to be beneficial for BOD emissions.

Aldy (2004) made an analysis of EKC in US of CO_2 emission. CO_2 which is basically odorless gas and it does not affect the health of people. The developmental changes seen in the economy and the link between emissions and trade was greatly affected by the relation between income and CO_2 .Econometric approach has been used here, data from1960-1999 has been collected . In the 1st set of regressions the income function was taken as Quadratic, 2nd income was taken as cubic spline function which seems to be more flexible and at the 3rd step regression was made more flexible by slope parameter. Estimated EKC appear to change by state

Jeberger (2011) examined that there has been a lot of work done on the reduction of CO_2 emissions. He has followed the inverted U-shaped EKC and developed a spline model and observed that there are a large number of agreements on the forecasts of CO_2 emission. According to the author the multilateral environmental agreement is such that it should be taken into consideration and people should negotiate about it. This is the only that makes us clear about global warming and the fight against climate change and reducing the emissions. It is very important has negative impact of atmosphere MEAs on per capita CO_2 emissions and they keep the level of temperature below 2. At the end it has been concluded the climate change has been stopped by future and current atmosphere. Some important policy implementation should be done for the reduction of CO_2.

Frankel and Rose (2004) carried out a study to examine the impact of trade on country's environment for a specific level of GDP. Data from different countries has been taken which shows a slight increase in the level of pollution while other things remaining constant. Correlation has been observed between SO_2 and trade it may be because of Porter hypothesis which indicates that environmental regulation initiates productivity which has positive effect of income as well as trade. Gravity model has been used here to see the effect of trade on environment. The variable that has been used here are instrumental, income as an endogenous variable. It has been concluded from this paper that economic growth is being effected by trade and trade indirectly effect the environment. From EKC curve we can observe that when income is less pollution is very high.

Sheikh and Shar (2010) carried out a study to examine the association between FDI, trade and economic growth in Pakistan. VAR model has been used here which shows that there is a long run relation between these factors. This paper points out the results of FDI, trade and economic growth since 1986. Unit root test and co integration test has been done here. At the end it has been concluded that there is a relative increase shown in trade and economic growth. Paper shows casual relation between economic growth, export and FDI both of them are considered to be important factors.

Kuik and (2001) examined that a group of developed countries worked on reducing the emissions of

greenhouse gases which was with the authority of Kyoto Protocol of UN framework convention related to climate change. Due to greenhouse gas emission there has been a lot of effects on the trade and investment side of the countries. Annex-I countries has been adversely effected and they may face loss in competitiveness and carbon leakage. Special attention should be given for implementing new policies and other trade barriers. In the Uruguay Round of Multilateral trade different kind of agreements were made and negotiations on different policies was done because of these agreements carbon leakage problem was reduced by 3% and the competitiveness was secured . The Model that has been used here is (GTAP-E) Global trade Analysis Model static multi-regression applied general equilibrium model. The data for this model was obtained from International Energy Agency and different sources. At the end it has been concluded from this paper that the effect of carbon leakage is positive and very minute. When the prices decrease of energy commodities the carbon leakage may not increase but it may show a gradual increase due to relocation of industry.

Islam et al (2012) have high lightened the relation between International trade and environmental issues. It is clearly indicated in this paper that if a country is facing environmental issues it may affect the trade, productivity industrial side. This study has been conducted in Bangladesh; the problem that this country is facing is the effect of environmental issue on its trade. The fluctuation in Prices is due to comparative advantage it also increases the trade in different locations and because of this many industries are adversely affected in different locations. (Copeland and Taylor, 1995) negotiated that because of the entire scenario mentioned above the industries that are most polluting shift to the countries where there is more environmental problems. Data has been collected for 32 years (1976-2008) and a mathematics model has been developed (SATA). The procedure of International trade is taken into account and the characteristics of CO_2 emission are explored and it has been concluded that there is a positive relation between trade and CO_2 emission.

Jha and Rabindran examined the effect of environment on trade in India. Most of the problems that were created in trade liberalization were because of weak environmental policies. This paper focuses on policies of trade liberalization in India and how government played an important role by starting a scheme for economic improvement that involved industrialization, trade policies as well as privatization there were two main control program's held in India, Water control Act (1974) and Air prevention and control program (1981). Data has been collected and 3 hypotheses were tested weather domestic production in India was more before or after trade liberalization in dirtier industries. Secondly, we examine weather India has some incentive because of pollution or not two affects has been observed India has incentive; India has no incentive we analyze on these 2 periods. Finally we investigate that FDI shows drastic rise in pollution incentive industries after the trade liberalization in alternate to the less polluting industries. Regression Model has been used in this paper, Heckmans two step selection model. Data has been collected from Annual survey of Industries Central Statistical Organization in India. It has been concluded that exports and FDI are increasing in more polluting areas. Due to trade openness there was an increase in exports industries. Economic growth is being promoted by trade liberalization. . Government should take special steps to control the tradeoff between economic gains from liberalization and environmental cost.

Dean (2002) conducted a study to examine the impact of environment on trade liberalization. It has been observed that the industries producing most of the pollution seem to migrate to developing countries. The H-O model has been mentioned here in this paper that country with low price ratio will be classified as environment abundant. There would be specialization in pollution intensive goods due to free trade there would be no variation in the use of environment. According to Grossman and Kruegar (1995) the endogenous variable which is pollution and the environmental damage caused in a country based on the income level of a country the income growth has 3 effects here scale, composition and technique effect. Economic activities increase the inputs and emissions (scale effect). The demand for clean environment increases due to higher income, reducing emission (technique effect) and where output decreases and emission reduces (composition effect). The inverted U hypothesis gives us the assumption that decreased level of income, the scale effect outweighs composition and technique effect. Poor country starts importing due to change in environmental damage. Pooled Provincial data has been used in this paper on Chinese water pollution. It has been concluded from this paper that environmental damage is made worse by free trade but income growth makes it less scarce. The Net effect in china that has been observed was much more advantageous.

Youssef et al (2012) conducted a study in Middle East and North American countries to find the relation between CO_2 emission, energy consumption and GDP. The EKC hypothesis gives us an idea that the relation between environmental quality and economic growth is very confusing. If income attains a higher level the emission also increases till some specific point after that emission starts decreasing. Data has been collected annually from World Bank Development Indicators (1981-2005). This article focuses on 3 basic things if EKC exists in MENA regions. Secondly we determine the EKC level for each and every country and the nature of causality relation between economic growth, energy consumption and CO_2 emission to find the relation between these variables unit root test and panel co integration has been applied. In long run energy consumption has positive and important effect on CO_2 emission. This emission tends to increase gradually with real GDP and then

starts reducing. The increase and decrease in these factors will be explained by Institutional laws. People are well known with the technologies used for energy saving techniques and reducing these emissions. The policies of most of the MENA countries seem to change and they start adopting true prices as a consequence energy consumption shifts.

Aklin (2013) explained the impact of trade, environmental degradation. It has been divided into two basic hypotheses according to the 1st hypothesis because of trade there is a lot of redistribution of the resources much more efficiently and secondly the market failure leads to excessive use of resources and due to this reason pollution seem to increase day by day. The products which produce most of the pollution are sent to countries where the environmental laws are much tougher and are again re imposed with high demanding laws. Different economists have figured out that EKC has an inverted – shaped because when per capita pollution increases income may also rise. While other scholars have suggested that if we make second mover advantage in which the country that develops later due to some problem they emit more CO_2. Regression Model has been used here to clarify the role of trade. Data has been collected from 157 countries since 1997-2000. In this paper it has been concluded trade seems to be responsible for this effect. Trade may explain the marginal decrease of pollution in industrialized country.

Chapter 3. Research Methodology

3.1 Theoretical Framework

Countries where there is a lot of pollution the people don't pay tax the investors tend to move to those places where environmental pollution is minimum therefore they have minimum taxes for pollution. Till 1960 FDI was fully dependent on theory of international factor movement because FDI played the role of marginal endowment efficiency as capital, means that capital was continuously flows from poor to rich country in the form of investment.

FDI affects international trade and environment in developing countries, FDI is inflow that broadly affects international trade and environment, but the effects of international trade goes' to developed countries while the environmental impact goes' to poor or underdeveloped countries.

3.2 Variables

This paper includes the CO_2 and trade openness (imports + exports / GDP) as variables. The dependent variable is CO_2 where independent variable is trade openness.

3.3 Data

The data has been collected from World Development Indicator (WDI) and Pakistan economic survey. The yearly data from 1980-2010 has been taken to analyze the causal relationship between liberalization of the trade and the quality of Air in Pakistan.

3.4 Model

Gu et al has used the same model of granger causality. Unit root test has been applied to check their relation in the long run and for stabilizing them and co integration has also been applied. The same variable has been used in this paper CO_2 and trade liberalization has unidirectional causality. CO_2 and FDI have bidirectional causality. Muhammad and Fatima has also used granger causality test to differentiate in the long and short term period between the same variables.

Choi et al (2010) applied the same model and it has been examined from this paper that most of the variables are non-stationary; the series may be stationary if the variables have a linear combination.

$$x_t = \alpha + \sum \alpha_i Y_{t-i} + \sum \beta_j X_{t-j} + e_t \quad \text{(3.1)}$$

$$yt = \alpha_o + \sum a_i x_{t-i} + \sum b_{jyt-j} + u_t \quad \text{(3.2)}$$

In equation (3.1), carbon dioxide emission is denoted by xt and summation has been taken of lag of FDI. CO_2 is dependent variable and to check the casualty we take the lag of the independent variable (FDI) which is the openness of trade. The openness of trade (OT) is defined as the exports plus imports divided by the gross national product.

In equation (3.2), yt denotes (FDI) and summation has been taken of the lag of CO_2, the openness of trade which is used as a proxy for trade liberalization is taken as a dependent and to check the granger causality the previous behavior by taking the lag is taken of the CO_2.

Chapter 4. Analysis and Estimation

This chapter start with descriptive statistics the detail of descriptive statistics are explained

4.1 Graphical Analysis

Figure 4.1(a) CO_2 Emission

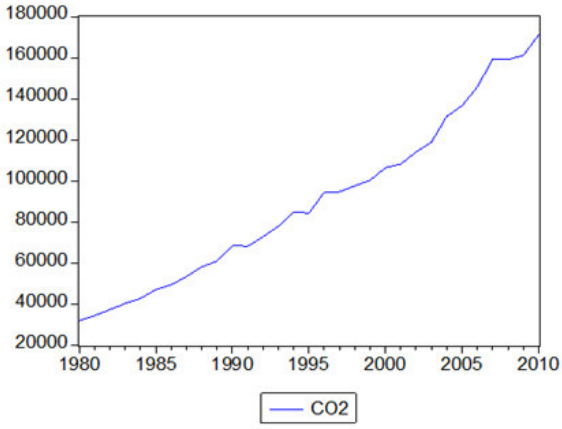
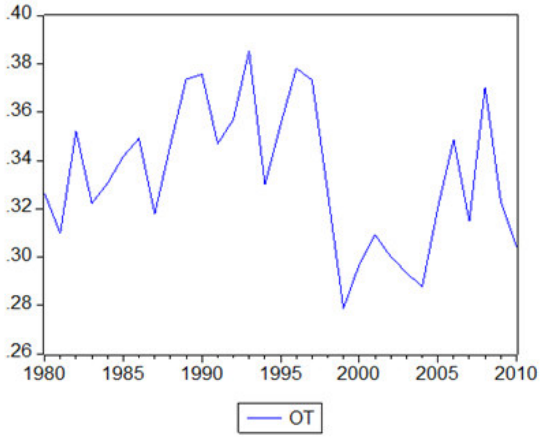


Figure 4.1(b) Openness of Trade



In figure 4.1 the CO_2 emission was consistently increasing with time which is bad for environment and will create problem for sustainable development. CO_2 increases because of trade, the imports increases in Pakistan much more advanced machinery and technology is as such demanded from outside that increases the emission of carbon dioxide. Yearly increase is shown in this graph since 1980-2010 gradual increase has been noticed.

In 1990 carbon emission was started as it was just the beginning so it didn't affect much of the industries and environment but when the carbon emission increased in 2000 it effected the trade very much. The outside people were not willing much to export their products to Pakistan. Government of Pakistan started working on the control of emission in 2005 so there was a gradual increase observed in trade and in 2010 the government was already working on the reduction the carbon emission but the damage caused in 1990 was so vast that it couldn't be controlled fully.

4.2 Descriptive Statistics

4.2 Table

	OT	CO_2
Mean	0.333779601	90752.347312
Median	0.330090509	84839.712
Maximum	0.38543304	171212.5967
Minimum	0.278890503	32067.915
Std. Dev.	0.0291679819	41836.119840
Skewness	0.0377019897	0.3817304447
Kurtosis	2.03007720829145	2.03522826486075
Jarque-Bera	1.2224798100	1.9551403313
Probability	0.5426775830	0.3762241514
Sum	10.347167631	2813322.7667
Sum Sq. Dev.	0.0255231351	52507827698.
Observations	31	31

In table 4.2 the total observation in the study is 31 which is annual data from 1980-2010. The mean of openness of trade is 0.33 which is obtained by adding total value of openness of trade and divided by total observation. Same for CO_2, the mean is 90752.3 which are obtained by adding total value of CO_2 and dividing it by total observation. The median value show the average of two middle data when they are arranged in ascending order. The median of openness of trade is and CO_2 is 0.33 and 84839.7 respectively. Both median of openness of trade and CO_2 are close to the mean values that mean that the data is converge at same level. The maximum value of openness of trade is 0.38 and minimum value is 0.278 in the data. While the maximum value of CO_2 is 171212.6 and minimum value is 32067.9 in the data. Both the variables are positively skewed. The kurtoses of both variables are positive and less than three so the data is lepto-kurtic. Jarque Bera test is used for normality of the data. The probability of both variable are greater than 5% so accept the null hypothesis and

conclude that data is not normally distributed.

4.3 Pairwise Granger Causality Test

4.3 Table

Pairwise Granger Causality Tests			
Date: 12/13/13 Time: 15:27			
Sample: 1980 2010			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
OT does not Granger Cause CO2	29	2.128263660	0.034016331
CO2 does not Granger Cause OT		2.598978273	0.095127351

Table 4.3 show the causality between CO_2 emission and openness of trade. At 5% of significance level the causal relationship are found which is uni-directional between openness of trade and air quality for carbon emission is used as a proxy. When trade barriers are removed the openness of trade influences the carbon dioxide concentration in the air. While at 10% significance level the result shows that CO_2 granger cause OT which indicates that the lag value which is past behavior of openness of trade influencing the emission of CO_2 concentration in Air. CO_2 is affected by trade intensity means with less trade policies and regulation of barriers will affect the concentration of CO_2 emission in the air which badly affects the quality of environment.

We are confident after the estimation that uni-directional relation exists between the openness of trade and the carbon emission. The expansion in the international trade pattern or any specified country liberalization of trade leads to three specific decomposition of trade effect that is scale effect, composition and technology effect .All these effects are responsible for the degradation of environment quality in that concern nation.

Due to openness of trade the country is effect as a technology change if the transferred technology due to trade is not environment friendly.

4.4 Result and Discussions

In table 4.3 Openness of trade is statistically significant and its P-value is 0.034 which is minimum than 5% of significance level. Gu et al (2013) conducted a study and found that unidirectional causality exists between foreign trade dependency and carbon dioxide emissions. When trade increases carbon dioxide emission also increases because of pollution that is being emitted by different industries and because of other factors as well such as by the pollution which is being emitted by the vehicles it is not good for the health of human beings. The significance level in the paper mentioned is 0.004 and in this paper it is 0.034 both of them are significant.

Javaid and Shariff (2013) conducted a study and examined that energy consumption cause carbon emission and the relation between these two is bidirectional and the significance level is 0.00 means carbon emission is caused by energy consumption. If energy consumption increases means the consumption of fuel also increases which leads to carbon emission.

Chapter 5. Summary, Conclusion and Policy Recommendations

5.1 Conclusion

The issue of trade liberalization effects on the environment has started in 1991 when NAFTA (North American Free Trade Agreement) was formulated. Environmentalist argued that this free trade agreement will degrade the environment quality at national and global level. Keeping in Mind the same argument of environmentalist we analyze that incase of Pakistan trade liberalization has affected the carbon emission concentration in Air. This degradation in the environment in case of Pakistan is due to the transfer of dirty industries as a result of foreign direct investment. The increase in size of production which is the scale effect of trade liberalization is also the cause that CO_2 emission is affected by openness of trade.

5.2 Policy Recommendations

Government of Pakistan should implement such policies that are not harmful for the environment such as the agreement which allow the receiving of dirty technology which is good for producers to earn high profit but bad for the environmental quality. Government should only sign that trade agreements with countries where the compensation for rehabilitation of environment is paid. Government needs to do cause benefit analysis before the inflow of FDI to examine if it will cause benefit to our country or it will be harmful for our country if cost is more than the loss then it should sign the trade agreement with its opponent.

References

Abadie, Alberto, and Guido W. Imbens. (2006). Large Sample Properties of Matching Estimators. *Econometrica 74* , 235-267.

Aklin, M. (2013). Trade, Development & The Environment: The Diffusion of Carbon Dioxide Emissions.

Coondoo D, Dinda S. (2008). The carbon dioxide emission and income: a temporal analysis of cross-country distributional patterns. *Ecological Economics* , 375-385.

Dean, J. M. (2002). Does Trade Liberalization Harm the Environment? A New Test. *Canadian Economics Association , 35, No 4*, 819-842.

Duy, L. N. (2007). The Impact of Trade Libralization on the Environment in some East Asian countries: An empirical Study. *Faculty of laws, Economics and Management* .

Eunho Choi, Almas Heshmati, Yongsung Cho. (November 2010). An Empirical Study of the Relationship Between CO_2 Emission, Economic Growth and Openness. *The Institute for the Study of Labor (IZA)* .

Javid Muhammad and Sharif Ghulam Fatima. (2013). Energy Consumption, Financial development and CO_2 emissions in Pakistan. *Pakistan Institute of Development Economics* .

Jeffrey A. Frankel and Andrew K. Rose. (2005). Is Trade Good or Bad for the Environment? Sorting out the Causality. *The MIT Press , 87*, 85-91.

Kuik, O. (2001). The Effect of Trade Liberalization on Carbon Leak-age under the Kyoto Protocol: Experiments with GTAP-E. *Global Economic Analysis* .

L.Corong, E. (2008). Tariff Reductions, Carbon Emissions, and Poverty: An Economy-wide Assessment of the Philippines. *Institute of Southeast Asian Studies (ISEAS) , 25, No. 1*, 20-31.

Mohammad Rafiqul Islam, Youzhong Cheng, Md. Salah Uddin Rajib. (2012). International Trade and Carbon Emissions (CO2): The case of Bangladesh. *Economics and Sustainable Development , 3, No 5*.

Natalia ZUGRAVU, Katrin MILLOCK, Gérard DUCHENE. (2008). The Factors Behind CO_2 Emission Reduction in Transition Economies.

Unruh GC, MoomawWR. (1998). An alternative analysis of apparent EKC-type transitions. *Ecological Economics* , 221-229.

Wermer Antweiler, Brian R. Copeland, M. Scott Taylor. (1998). Is Free Trade Good for the Environment . *National Bureau of Economic Research* .

Zusha Gu, Ying Gao, Cong Li. (2013). An Empirical Research on Trade Liberalization and CO_2 Emissions in China. *International Conference on Education Technology and Information System* .

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar