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IS SOUTH ASIA A POLLUTION HAVEN?

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Abstract
The pollution haven hypothesis maintains that the industries that are highly pollution intensive i.e. dirty industries have been migrating from developed economies to the developing world. In this study, the pollution haven argument for south Asian countries for the period of 2000–2016 is examined. It also attempts to investigate the impact of carbon emissions on the export demand of south Asian countries. The Panel data multiple regression analysis (PDMRA) has been employed to find the relationship between the exports and pollution. The study focuses on the pollution haven hypothesis from the trade perspective. It is found that exports increase as the dirtiness of the industries increases providing some evidence for the pollution haven hypothesis and carbon emissions has significant and positive impact on export demand of south Asian countries. The study also suggests the policies for the stakeholders i.e. enforcement of environmental regulations, spending on research and development to device clean method of production and clean technologies and incentives to the producer to use cost effective clean technologies to ensure sustainable development in south Asian countries.

Keywords: *south Asian countries, Panal data, Exports of a Country, Carbon Emissions*

INTRODUCTION

Pollution haven hypothesis is among the major environmental challenge that arises due to free trade among countries. . It is argued that the environmental concerns of the developed economies caused them to enact strict environmental regulations which have increased the cost of production of the dirty industries at home. On the other hand, the developing countries with their low wages and lax environmental regulations have been attractive alternative producers in these sectors. Thus developing countries provide pollution havens for dirty industries. The Pollution Haven Hypothesis (PHH) claims that under free trade scenario around the globe, multinational firms found to relocate the production of their pollution intensive production units towards developing countries. Generally, developing countries practice poor and inefficient environment monitoring and environmental law implementation system. Therefore, over the time developing countries will develop a comparative advantage in pollution-intensive industries and becomes "havens" for the world's polluting industries. Thus, developed countries get benefits in terms of their home countries' environmental quality form trade while developing countries face environmental deterioration from this trade. Hence, developing countries often face and tradeoff between trade and environmental quality. Pollution haven hypothesis (PHH) states that dirty industries of developed countries are shifting into developing countries due to stringent environment laws .Lax environment laws attract foreign direct investment for industrial expansion and economic growth. Exports of these dirty industries increases beside the increase of the developing country's GDP. Indirectly developing countries become the importer of pollution of dirty industries and developed countries become the importer of those pollution intensive goods.

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Table1: Environmental performance index of South Asian Countries 2018

Environmental performance index of South Asian Countries 2018		
Country	**EPI score**	**Rank**
Pakistan	169	37.50
India	177	30.57
Bangladesh	179	29.56
Bhutan	131	47.22
Nepal.	176	31.44
Maldives	111	52.14
Afghanistan	168	37.74
Sir Lanka	70	60.61

Source: 2018 Environmental Performance Index

According to wheeler (2008), countries used lax environment laws as incentive to attract cost conscious investors of pollution intensive goods. It is not the debate of owner ship and market location. Investor may be domestic producer or foreign produce. Willingness of host government counts for the pollution haven debate. Objective of such government is to promote growth. Pollution havens appear when geographical distribution of industrial activity is changed rapidly by trade and investment flows. It is not sufficient to qualify as pollution haven when industries are shifting to developing countries .One thing more important at this point is that Pollution haven hypothesis not only takes into account the pollution effects of foreign industries but also considers the pollution emitted by local industries. Cost conscious investors always prefer that area or location where cost of productions is low. It means that jurisdiction which is called pollution haven must have lax environmental laws.

High income countries face demand for implementation of environment laws. It is considered that developed countries are richer and people of these countries are more concerned about the environment and are able and willing to pay the price to save the environment and to keep environment clean. Therefore, environment laws and their implementation are strongly enforced. Economic motive is that environmental quality is a normal good, and as per capita income of people increases, demand for cleaner environment rising developed countries, it creates political demand pressure for cleaner environment. Hence cost of production of dirty industries is higher at home for developed countries. While developing countries have lax environment laws or lack in implementation of environment laws, raw material and man power is available at low cost. Polluting industries of developed countries migrate to the developing countries.

Environmental policy maker are worried about pollution haven hypothesis due to three reasons. Firstly, morally it is injustice or bad to migrate the dirty industries into the developing countries by threat of migration into lax regulated countries .Home country protects its investors by relaxing or changing strict laws .Thirdly ,PHH only considers the change in trade patterns of developing country. PHH emphasizes less on benefits such as the raising income levels and technology transfer in developing country. Environmental quality being a normal good, as income of people

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increases; it improves the environment regulations In case of Pollution Haven Hypothesis, trade liberalization affects the environment quality via the difference in pollution policy and this difference is the main factor in the PHH that contributes to gain comparative advantages to a country. Therefore, developing countries with the lax environmental with the lax environmental policies have the advantage to specialize in pollution intensive industries. Hence these countries become a haven for dirty industries of developed countries.

Temurshoev (2006) also differentiates between the pollution haven effect and pollution haven hypothesis .Pollution haven effect is explained as the plant location and trade flows are affected by the difference in environmental regulations ceteris paribus .That is net exports of dirty industries of a country increases as the environmental regulations are lax and vice versa. While pollution haven hypothesis is that, the pollution intensive industries relocate from stringent regulates developed countries to lax regulated developing countries. Hence, PHH is a stronger form of pollution haven effect.

Export growth is especially related to pollution intensive industrial products rising gradually. This expansion of dirty industry's export increases the level of pollution in South Asian countries as well. This industrial pollution is playing a major role in damaging the environment due to lax environmental laws or inappropriate implementation procedure. It may lead to a probable conclusion that South Asia is a pollution haven for developed countries. Studies have been conducted on the environmental consequences of pollution. There has been little research on the relationship of pollution and exports on the basis of pollution haven hypothesis. This study establishes the link and estimates the relationship between exports and pollution empirically.

This study is designed to address the following objectives:

- To identify the determinants which causes pollution?
- To test the pollution haven hypothesis by empirically estimating relationship between exports and pollution by using panel data for south Asian countries.
- To suggest evidence based policy recommendations.

This study will find the answer to the question, "Is South Asia a pollution haven?" The study in hand would explore the relationship of increasing the pollution with increasing exports by empirical estimation.

The hypothesis of pollution haven will be tested by taking carbon emissions(pollution proxy) as explanatory variable in export demand function, which states that an increase in pollution in the country is causing the significant increase in the exports of the south Asian countries.

H_0: There is a positive relationship between pollution level and export's demand.

H1: There is a negative relationship between pollution level and export's demand.

LITERATURE REVIEW

Literature is divided into two parts first related to different theoretical models of (PHH) and second related to econometric estimation techniques of PHH used.

Literature on Theoretical Modeling

Temurshoev (2006) explored that there are three reasons of developing countries to set lenient environmental regulations. First, environmental regulations are comparatively costly to monitor and implement in developing countries. This can be attributed to several reasons like lack of trained persons, lack of advanced equipment's corruption and large cost to implement newly advised environmental regulations. Secondly, Developing countries have to face many basic problems like

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low income level, unemployment, low level of exports creating fiscal deficits. Developing countries show little or no concern to environmental pollution or problems, while developed countries with sufficient income level demand more of clean environment. Thirdly, growth in developing countries changes the composition of production from agriculture sector to industry. This accelerates the urbanization and demands more investment in urban sector, resulting in an increase in pollution level.

Millimet & Roy (2011) stated the existing literature on pollution haven hypothesis due to two different limitations, one lack of appropriate instrument variables to overcome the problem of measurement error and unobserved heterogeneity in environmental regulations. Secondly impact of environment regulations on the outcome of decision of choice of location for the foreign investors and trade pattern remained uncertain due to missing of spatial effects inn their models. According to Wang & Wheeler (2005) countries used lax environmental laws as incentive to attract cost conscious investors of pollution intensive goods.

Azhar et al. (2007) studied possible environmental effects on trade liberalization in Pakistan. This study focused trade liberalization effects on pollution in three ways i.e. technique, composition and scale effects. Michael et al. (2014) tested the pollution haven hypothesis in Nigeria. GDPG, DGDPG, CO_2, DCO_2. CO_2emission (a measure of environmental pollution) is positively linked with foreign direct investment inflow and output growth in the short run but negatively related to trade openness. Trade openness however is beneficial to the environment as revealed by the negative relationship between pollution and trade openness. Only one measure of environmental condition is considered here. The study did not examine the issue of resource depletion. Policies must be adhered to strict environmental taking into cognizance the integration effects on the environment.

Faruqee (1996) Studied Pakistan's major environmental problems both green and brown and assessed the extent to which economic policies affect incentives to protect the environment. Ederington et al. (2004) estimated two types of pollution haven effects, one is “direct pollution haven effect” and other is “indirect pollution haven” by taking US manufacturing industry data for period of 1978-1994. The direct pollution haven effect is when strict environmental regulations cause an increase in the imports of pollution intensive industries. The indirect pollution haven effect is when international trade pattern of industries is affected due to trade liberalization.

Dietzenbacher & Mukhopadhyay (2004) examined the PHH for India. The authors calculated that if exports are increased by one billion rupees by how much pollution (CO2, SO2 and NOx) will increase by using the real share of each commodity in total exports. This is then compared with the reduction of pollution due to an increase of India’s imports by one billion rupees using the actual commodity shares in total imports in computation. Under different assumptions of pollution from fossil fuel combustion (production-generated pollution and consumption generated pollution) the authors find that India gains considerably from extra trade thus rejecting the PHH. The results show that over time this benefit only increased thus India has moved further away from being a pollution haven.

Shofwan & Fonng (2011) explored the correlation between carbon emission (CO_2) and three macro level variables i.e. gross domestic product (GDP), population and foreign direct investment over the time period from 1975 to 2009. Relationship between GDP and CO_2 emission was found to be negative and significant whereas population was found to be positively and significantly correlated

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with CO_2 emissions. Relationship between FDI and CO_2 emission was insignificant indicating absence of pollution haven hypothesis in Indonesia despite Indonesia states as a developing country.

N.T. et al. (2014) assessed the relationship between foreign direct investment, pollution and Economic growth in India the results showed that FDI and Growth have indirect impact on global pollutants like CO2 emissions. This indicates that the country in growing at the high rate but there is much increase in CO2 emissions and no environmental protection laws have been implemented. The growth in the country will attract the FDI in the short run. However in the long run growth will encourage the FDI.

Ederington et al. (2005) found no evidence supporting any link between trade flows and environment regulation in the pollution intensive industries facing higher proportion of the environment cost to their total cost. Grossman & Krueger (1995) explored their research on Economic growth and Environment. They examined the reduced form relationship between GDP per capita and the local environmental indicators such as urban air pollution, the state of the oxygen regime in river basins, and contamination of river basins by heavy metals and faecal contamination of river basins, there has been no evidence found that through GDP growth environmental quality deteriorated. The turning points of the pollutants came before the per capita income of a country reached to 8000$

Levinsin & Tylor (2006) studied the role of environment regulation as the determinant of trade flows by using both theoretical and empirical strategies. Data of 130 manufacturing industries from 1977 to 1986 was used to find the relationship between environment regulation and trade flows among 3 neighboring countries Canada, Mexico and USA. Industries having the higher abatement cost had highest level of impact.

Baghebo and Apere (2014) explored the contributions of trade liberalization and foreign direct investment inflows on growth in Nigeria. The results which emanated from the findings depict that there was none existence of a long run relationship between FDI and growth on the one hand while there exists a long run causal link between CO2 per capita (a measure of environmental quality) and FDI inflows on the other hand and economic growth and foreign direct investment into Nigeria significantly fueled pollution while trade is beneficial both in the short and long run.

Akbostanci et al. (2007) investigated the relationship between pollution index and the demand of exports for Turkish manufacturing products under the imperfect substitution model through fixed effect and random effect models by using the data from 1994 to 1997. Try fond a positive relationship between pollution index and demand for pollution intensive exports indicated the increase in the dirtiness increased the demand for the exports.

Literature on Econometric Methodologies

Yousaf *et al.* (2018) studied foreign aid and environmental degradation analysis in Pakistan using the ARDL bounds testing technique. The a study focused on the relationship among foreign aid, per capita GDP, energy consumption, foreign direct investment and carbon emissions in Pakistan. All the required data have been sourced from Pakistan Economic Surveys and World Development Indicators (WDIs), of the World Bank. The study covers the time period from 1972 to 2013. The study resulted that both loans and grants appeared statistically significant and positively affect the environment quality. Energy consumption have also been proved to be significant determinant of inflation in the country.

Copeland & Taylor (2004) argued that it's important to separate the "pollution haven effect" i.e. an effect of environmental regulations on comparative advantage on the margin affecting plant locations and trade flows from the "pollution haven hypothesis" a systemic shift in industrial structure concentrating pollution intensive industry in countries with lax environmental standards. They argue that the theoretical and empirical support for a pollution haven effect is strong while the 9 evidence for the pollution haven hypothesis is weak. The explanation is that in practice the cost of complying with environmental regulations

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for businesses is outweighed by other factors that have greater importance for determining trade flows. The differences in factor endowments or technology. Their conclusions are thus in line with those of Ederington et al. (2003). The very same argument was also used by Grossman and Krueger (1994) in an influential paper showing that in the context of NAFTA Mexican comparative advantage in low-skilled labor (used in non-pollution-intensive production) outweighed the importance of differences in the cost of complying with environmental regulations.

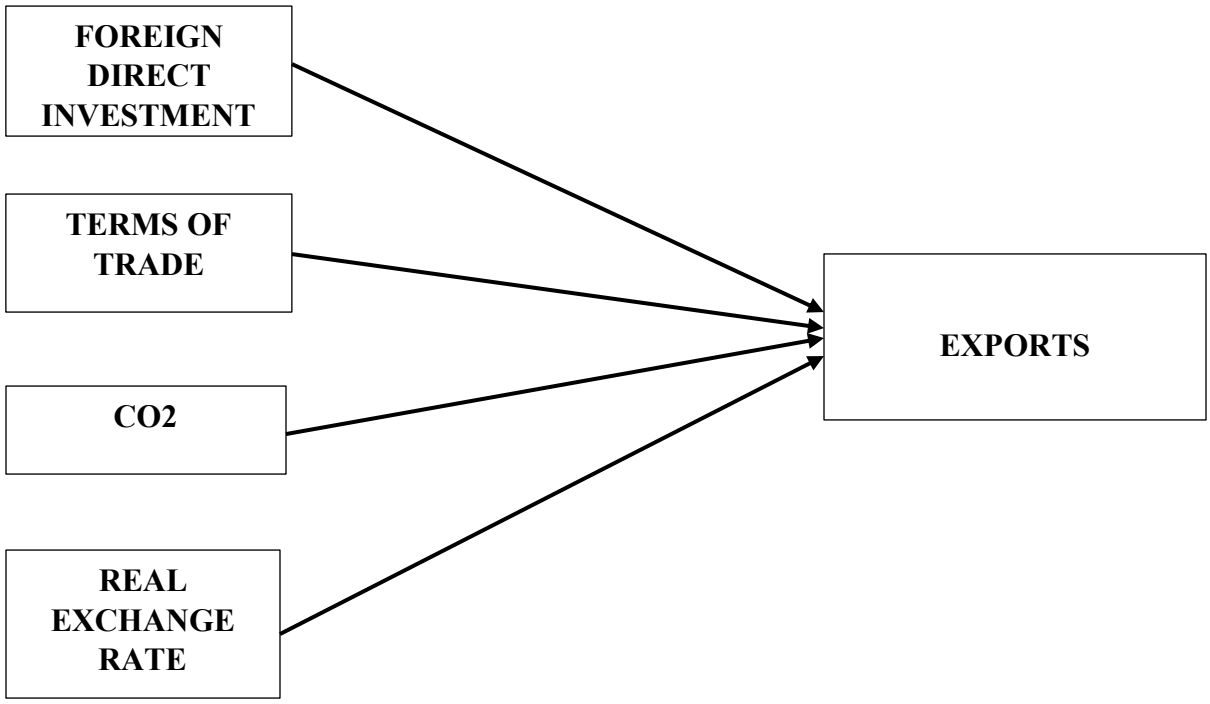
Aldy & Pizer (2015) tested the PHH by estimating the fall in the production and rise in the imports due to increasing energy prices resulting from climate change mitigation policy. Disaggregate data of 490 U.S manufacturing industries consist of 35 years was used for the analysis. Results of the Panel regression showed a significant fall in the production as a result of increase in the energy prices in the energy intensive sectors. Consequently imports of such products increased considerably.

All the studies cited above, revealed dissimilar inferences about the presence of pollution haven hypothesis and linkages between trade and environment.

THEORETICAL FRAMEWORK

Theoretical framework is a diagrammatic representation of the model, which shows the relationship between dependent variable and independent variables.

Figure 1:



Independent Variables **Dependent Variable**

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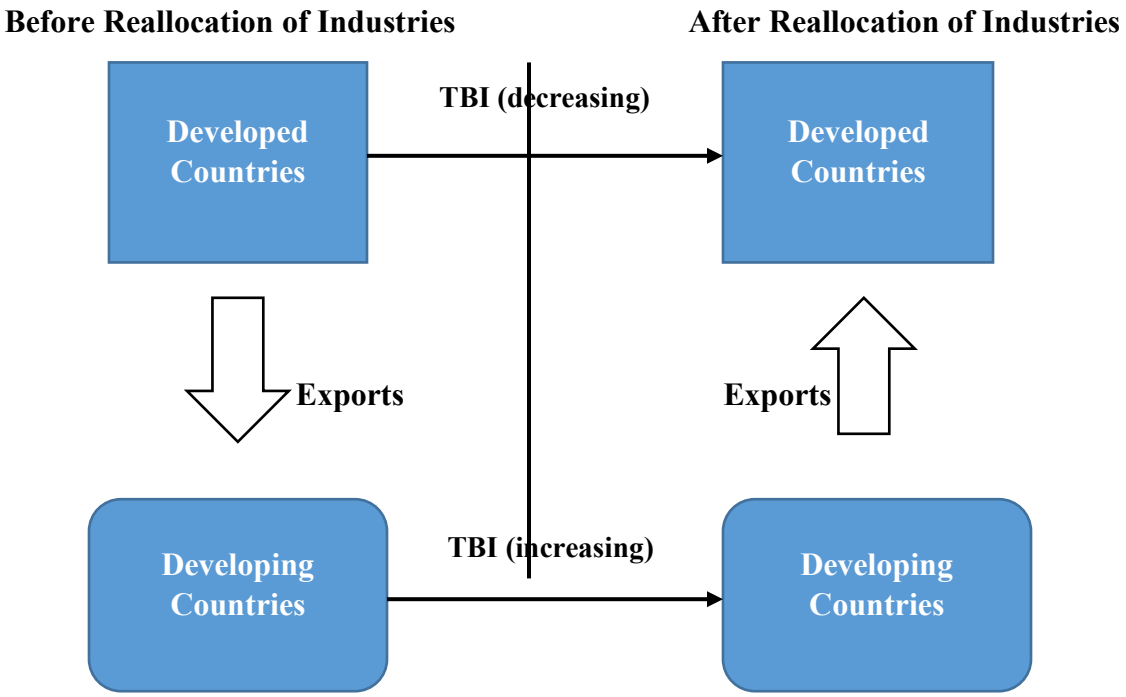
Explanation:

Five variables are introduced in this model export is the dependent variable and FDI, TOT RER and CO2 are the independent variables. According to the theory depreciation in real exchange rate (RER) increases the competiveness of a country's export and consequently demand for exports rises. So, the exports are expected to be negatively related with RER. The rise in foreign direct investment will increase the competiveness of exports so there would be positive relation between exports and FDI. The rise in terms of trade will increase the competiveness of exports so there would be positive relation between exports and TOT. CO2 is the key variable in our study it is expected to be positive which means increase in carbon emission (pollution) raises the exports of a country and vice versa. If there is statistically significant and positive relationship between exports and pollution we can prove that south Asia is a pollution haven.

3.1) FRAMEWORK OF EXPORTS PATTERN

Export pattern before and after reallocation of industries of developed and developing countries framework is as follows:

Figure 2:



In the beginning, before the reallocation of industries, developed countries produce and export dirty products to the developing countries but after the reallocation of industries, developing countries that produce and export dirty products to developed countries. So there is a decreasing of TBI (Trade Balance Index) in developed countries, and an increase in TBI in developing countries.

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THE DATA AND METHODOLY

METHOD OF DATA COLLECTION

South Asian countries Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, India and Sri lanka taken for the analysis. The study used Panel data multiple regression analysis (PDMRA) to find the relationship between the exports and pollution. Random Effects, Fixed Effect Regression, Multicollinearity Test, Autocorrelation Test, Heteroscedasticity Test, Descriptive Statistics and Normality test.

Sources of Data

Secondary data is used in this study. The data of Exports of goods and services (constant 2010 US$), CO2 emissions (kg per 2010 US$ of GDP), Foreign direct investment, net inflows (Bop, current US$), Terms of trade and Real effective exchange rate index (2010 = 100) is taken from World Bank (WDI). The selected study unit has been collected on a number of appropriate variables during the period from 2000 to 2016, covering 17 years period.

Panel Data is used for calculations. Hence, in this research both characteristics are present in the data.

- Cross Sectional Data (because data of more than 1 country at a specific period of time).
- Time Series Data (because data of each country at more than 1 time periods).

In time series data, data is collected in different period of time of single country, whereas in cross sectional data, data is collected at specific time period from different countries. Because of panel data, size of the data has increased. Larger degree of freedom is advantage of larger data and that can enhanced the quality of estimates.

Variables of the study

The variables used in this study are Exports of goods and services (constant 2010 US$), CO2 emissions (kg per 2010 US$ of GDP), Foreign direct investment, net inflows (Bop, current US$), Terms of trade is taken from World Bank (WDI) and Real effective exchange rate index (2010 = 100).

Model specification

The export demand function for PHH is as follows:

EX= f (FDI, TOT, CO2, RER)

Econometric form:

$$EXit=\alpha 0+ \alpha 1FDIit+ \alpha 2TOTit+ \alpha 3CO2it+\alpha 4RERit+ \mu it$$

i=cross section; t=each time period

Where,

EX= Exports of a Country
FDI= Foreign Direct Investment
TOT = Terms of Trade (PX/PM*100)
CO2= Carbon Emissions
RER= Real Exchange Rate

DATA ANALYSIS AND RESULTS

RANDOM EFFECT REGRESSION

By use of Panel data regression Random Effect Model, data is analyzed.

Number of observations =136

Group variable: Country

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R-sq: within= 0.1244, between = 0.0198, overall = 0.0590
Wald chi2= 42.81 Prob > chi2= 0.0000
corr(u_i, X) = 0 (assumed)

Table 2: Panel Data Regression Random Effect Model Result.

Exports	Coeeficients	Standard error	P>|z|
FDI	10.8388	0.4138	0.000**
CO2	4.79e+10	1.40e+10	0.001**
TOT	1.96e+07	9.22e+07	0.831
RER	-1.92e+08	2.15e+08	0.374
Constant	11.78753	2.14e+10	0.000**
sigma_u	1.31		
sigma_e |	3.4059541		
Rho	0.129(fraction of variance due to ui)		

**statistically significant at 5% level of significance
sigma_u = sd of residuals within groups ui
sigma_e = sd of residuals (overall error term) ei
12.9% of the variance is due to differences across panels.
'rho' is known as the intraclass correlation
Differences across units are uncorrelated with the regressors
The overall model is statistically significant as the p value is < 0.05 model is ok.
Other things remaining the same, if we increase FDI by one percent the exports demand rises by 10.83 percent and FDI coefficient is statistically significance at 5% level as its p value is less than 0.05. CO2 also has positive and significant relationship with export demand. TOT and RER has negatively related with exports demand and statistically insignificant.

FIXED EFFECT REGRESSION

By use of Panel data regression Fixed Effect Model, data is analyzed.
Number of observations =136
Group variable: Country
R-sq: within= 0.5244, between = 0.7619, overall = 0.6790
Wald chi2= 42.81 Prob > chi2= 0.0000
corr(u_i, X) = -0.097

Table 3: Panel Data Regression Random Effect Model Result.

Exports	Coeeficients	Standard error	P>|t|
FDI	11.051	0.4138	0.000**
CO2	4.37e+10	1.40e+10	0.003**
TOT	-2.53e+07	9.22e+07	0.787
RER	-1.43e+08	2.15e+08	0.640
Constant	3.4275	2.14e+10	0.000**
sigma_u	1.220		
sigma_e |	3.5059541		
Rho	0.1083(fraction of variance due to ui)		

**statistically significant at 5% level of significance

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sigma_u = sd of residuals within groups ui
sigma_e = sd of residuals (overall error term) ei
12.9% of the variance is due to differences across panels.
'rho' is known as the intraclass correlation
Differences across units are uncorrelated with the regressors.
The overall model is statistically significant as the p-value of chi square is < 0.05 model is ok.
The estimated regression equation above shows that foreign direct investment is positively related with exports. Other things remaining the same, a 1% increase in foreign direct investment would bring about an increase of 11.05%. CO2 has also a positive relation with exports; a 1 % increase in CO2 would lead to an increase of 4.37% on average in exports. TOT and RER has a negative and statistically insignificant relation with exports.

Random or Fixed model

To decide between fixed or random effects we run **Hausman Test.**

Hypothesis

H0: random model is preferred
H1: fixed model is preferred.

Table 4: Hausman Test Results

	——— Coefficients ———			
	(b) fixed	**(B) random**	**(b-B) Difference**	**sqrt(diag(V_b-V_B)) S.E.**
FDI	7.971856	10.83883	-2.866973	.2036748
CO2	-6.35e+10	4.79e+10	-1.11e+11	2.88e+10
TOT	-1.89e+07	1.96e+07	-3.85e+07	1.06e+08
RER	1.40e+08	-1.92e+08	3.32e+08	6.92e+07

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= **17.25**
Prob>chi2 = **0.0006**
(V_b-V_B is not positive definite)

As the p-value is less than 0.05 (i.e statistically insignificant) we will not accept null hypothesis and use fixed effects model.

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TESTING FOR TIME-FIXED EFFECTS

To see if time fixed effects are needed when running a FE model. It is a joint test to see if the dummies for all variables are equal to 0 if they are then no time fixed effects are needed.

Hypothesis

H0: β1= β2= β3= β4=0

H1: not equal fixed model is preferred.

Results

Table 5

F-Test Statistics	
F(4, 115)	319.14
Prob > F	0.0000

The Prob>F is < 0.05 so we reject the null that the coefficients for all variables are jointly equal to zero therefore time fixed effects are needed in this case.

TESTS FOR MULTICOLLINEARITY

CORRELATION MATRIX

Collinearity takes place when two independent variables (e.g., x_1 and x_2) in a multiple regression have a non-zero correlation. Multicollinearity occurs when more than two independent variables (e.g., x_1, x_2 and x_3) are inter-correlated.

Table 6: The Correlation Matrix for Testing Multicollinearity.

	EX	**FDI**	**CO2**	**TOT**	**RER**
EX	1.0000				
FDI	0.9486	1.0000			
CO2	0.6515	0.6078	1.0000		
TOT	-0.2118	-0.1848	-0.4541	1.0000	
RER	0.1441	0.1557	0.2534	-0.0825	1.0000

In the Correlation Matrix above correlation between Predictors and exports is as followed:

FDI, CO2, RER has which shows very significant positive correlation with exports. TOT has correlation value of -0.211, this values indicates the insignificant and negative correlation with Z-score.

Since all these Correlations between predictors are far from 1 or -1 which is considered the standard value for correlation, so there is no need to remove any predictor from the model, hence no issue of multicollinearity exists.

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TESTS FOR HETEROSCEDASTICITY

Homoscedasticity is regarded as constant variance of the error term. The **Breusch and Pagan Test** is used to test for heteroscedasticity problem in a linear regression model in statistics. It tests whether the probable residuals variance of a regression have dependency on the values of independent variables. If it is dependent then we have heteroscedasticity in our model.

Hypothesis

Ho: Error variances are all equal/ constant variance (Homoscedasticity).

H1: Error terms don't have constant variance (Heteroscedasticity).

Table 7: Breusch and Pagan Lagrangian Multiplier Test for Heteroscedasticity.

Test: Var(u) = 0	
chibar2(01)	0.00
Prob > chibar2	1.0000

The hetroskedasticity test made shows that the error term has constant variance. Small Chi2 and Prob>chi2 will indicate Homoscedasticity. And the table below also shows the same with Chi2=2.08 and Prob>chi2=1.000 Prob>Chi2 value is greater than 0.05 indicates that there is no hetroscedasticity problem. Therefore, we fail to reject the Homoscedasticity's null hypothesis

CONCLUSION AND POLICY IMPLICATIONS

CONCLUSION

The study in hand has tested Pollution Haven Hypothesis (PHH) by employing the export demand equation of imperfect Substitution Model (ISM) for south Asian countries. The model has been estimated by Panel data multiple regression analysis (PDMRA) for the period of 2000 to 2016. Carbon emissions were taken as explanatory variables along with other control variables of Real Exchange Rate (RER), Terms of trade (TOT) and Foreign Direct Investment (FDI). This study has drawn following conclusions. RER is negatively related with exports. TOT is negatively related to the exports as increase in the price ratio of exports and import results in the fall in the demand for experts. Positive and significant relationship between carbon emissions (environment degradation) and real exports indicates that south Asian countries is specializing in pollution intensive products. Therefore, south Asian countries is exporting products of dirty industry to the developed countries. Reason behind specializing in the pollution intensive products is that south Asia is a pollution haven for the dirty industry. Environmental regulations are quite good and compatible with international standards but they are not strictly implemented.

POLICY RECOMMENDATIONS

- Policy makers have to decide whether to go for strict implementation of environment regulations or to enhance GDP and exports of the country at the cost of environment. Being a developing country the priority of country is economic growth. However, such policies measure still can be taken that could lead to sustainable development in the country. Achieving both the goals of industrial growth and environment up gradation simultaneously is a big task. Industrialists cannot be freely allowed to degrade the environment. Furthermore, south asian countries also needs to give incentives of clean production technologies.

- The implementation of environmental regulations is possible by strong will of government. Quality of environment can be improved by introducing clean technologies. Therefore, there is a direct need of introducing environmental friendly cost effective technologies of production. Technological mode of production can also be adopted to upgrade the environment.
- Most of the developing countries faces GDP environment trade off. The economic growth though exports has been primary for developing countries. Achieving both the goals of GDP growth and intact/improvement of environment simultaneously is a big task. The study in hand suggest the evidence based policies for the stakeholders that economic development should not be made at the cost of environmental degradation. As it is revealed by the study that south asian countries are the producer of dirty industry and this dirty industry adversely affecting the national environment.

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