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Research Article

Exploring the Relationship Between Environmental Degradation and Economic Development in Pakistan

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Abstract

Environment plays an important role in to effect of economic growth in Pakistan. To determine if the data are stationary, the test of unit roots is used and ARDL (Auto regressive distributive lag model) techniques on the data for the period from 1989 to 2020. In our study, the dependent variable is economic growth and the independent variables are environment, population growth, foreign direct investment, gross fixed capital formation and trade openness in Pakistan. Overall, the main results show that the environment positively affects economic growth. foreign direct investment, trade openness and gross fixed capital formation also have a direct impact on economic growth. Our empirical results suggest that the environment plays an important role to increase the economic growth of Pakistan. Findings suggest that the government of Pakistan should pay particular attention to the promote energies to control pollution to boost the economy.

Keywords: Economic Growth, ARDL, Environment, Environmental Population

Introduction

Direct foreign investment, environmental quality, and productivity expansion are not correlated with one another and tend to follow radically different trends in emerging regions, where it is crucial to find out how to continue the expansion. Natural limitations, though, may lead to slower economic progress is necessary for demographic prosperity—followed by higher rates of unemployment. From a new angle, enhanced expansion and sustainability due to the technological transmission may present fresh possibilities and benefits. The kind and severity of the existing relationship between atmospheric health and socioeconomic development in emerging nations is a key topic that this problem highlights. International foreign investments, Emissions of carbon dioxide, and financial Fakher and Abedi development in various nations have long been the subject of much investigation. The pertinent prior research may typically be divided into two categories, although the majority of the practical evidence will remain ambiguous and up for debate. The Kuznets Curves (EKC) theory, which asserts that the link between productivity expansion and the atmosphere may be explained by a reversed curve, is the first to be discussed (Omri et al., 2015). This indicates that while a nation's growth increases the rate of environmental deterioration, it decreases after the average income reaches a particular level. Even without involvement from politics, the

hypothesis, which also forecasts wealth creation, holds the solution to upcoming environmental concerns. It may still be debatable how expansionary fiscal policy and its nature are related. Some people believe that the creation of new environmental issues, the inability to prevent climate change, and the Developing Country populace's continued growth are irrefutable evidence that people are a voracious and relatively brief species. Some, though, believe that the mirror is just half full. They highlight the significant improvements in urban sanitation and air quality, as well as the ongoing advancements in the human condition made possible by technological development. The very first grouping concentrates on the ongoing and frequently critical environmental concerns issues of the day, while the other discusses the lengthy but occasionally unpredictable background of household-level increases.

Literature Review

Sikandar et al (1992) investigated the varied causes of Pakistan's environmental pollution. Such variables increased environmental pollution as a byproduct of promoting global economic growth. These variables have time-series data from 1972 to 2018 and include economic growth, population, energy, consumption, and industrialization. Gross Domestic Product (GDP) concede as the dependent variable and Carbon Dioxide, Population, Industry, Energy, and Consumption are independent variables. Using auto-regressive distributed lag, long-term relationships are calculated (ARDL). These elements have made a good and substantial contribution to Pakistan's environmental deterioration. Environmental concerns might pose a danger to the industry and people's lives because of their crucial location. Utilization of clean and green energy should be promoted, and moderate- to lengthy measures should indeed be implemented to impose a ban on fossil fuels in the electrical industry. According to Fankhauser and Tol (2005), the impact of climate change on growth is rather small. It affects socioeconomic development, saving behaviour, and wealth generation. It examined the connection between Pakistan's industrial growth and climatic change. By examining the temporal correlation between climatic fluctuations and industrial development over the years 1973 to 2010, significant environmental impacts were calculated. Investments, employment, and Gross Domestic Product (GDP) are considered dependent variables. Individual variables include Openness, Agricultural, Industries, Service, Spending, and Temperatures. The efficiency of the agricultural, industrial, and services industries are all negatively correlated with temperatures, which is also a key factor in GDP. Auto Regressive Distributed Lag used (ARDL). There is a need for a common and complete strategy addressing the adoption of mitigation techniques to manage climate change since, if this happens, it would severely harm economic expansion. Cialani et al (2007) looked at the connection between economic development and atmospheric condition, was thoroughly investigated. To prevent disastrous environmental situations, in the end, the organization called for a stable system with zero growth. Technology advancement would enable continued growth by reducing reliance on environmental assets. It uses time series data from a single nation on a particular pollutant, co2. The decomposition analyzed the economic growth covering the period from 1990 to 2011.The included variables are Gross Domestic Product (GDP), Technology and Consumption. Aspects of sustainability including Sulphur Dioxide, Nitrous Oxide Emission, and Co2 have been

empirically linked to wealth, and early economic expansion is when climate deterioration is at its worst. systemic reforms only have little effect CO_2 levels, although productivity and volume changes appear to have a greater impact on the economy. Pao and Tsai (2010) find an association between Carbon Dioxide emission, energy consumption and Economic Growth in economies. Gross Domestic Product (GDP) is acknowledged as the dependent variable and Carbon Dioxide emission, Financial Development Index, Energy consumption, Trade Openness and Urbanization are independent variables. Statistics using Pakistan's Autoregression Distribution Lagged (ARDL) bounds test method from 1972 to 2014 show the links between the variables. After 1990, when the government adopted deregulation strategies and measures were taken to enhance the finances of the economy, the Pakistani economy underwent a transformation. In the past ten years, there has been a significant improvement in the financial economy as a whole. The nation's economic collapse is also a result of the acceleration of both monetary and monetary growth. Pakistan is one of the developing nations that produce the most dioxide, and it contributes between 7 and 8 % of the world's annual carbon dioxide emissions to warming. Due to significant industry investment, a growing population, and—most importantly—reliance on Pakistan's industry investment, the trend is continuously rising upward. By developing high technology and contemporary service sectors, efforts ought to be made to minimize the energy consumption of the industry. Since a rise in wealth also contributes to a rise in dioxide emissions, it is important to educate people about energy conservation and encourage low-carbon lifestyles. To examine the impact of energy consumption and economic growth on carbon dioxide emissions in Pakistan from 1965 to 2015, Owusu et al. (2017) used Autoregressive Distributive Lag (ARDL) to analyze the relationship between stock market development, electricity use, and industrialization on environmental devastation in Pakistan. Gross Domestic Product (GDP) accede as a dependent variable and oil consumption, coal consumption, Energy, and Carbon Dioxide are independent variables. According to a simulation model using Dynamic Auto Regressive Distributed Lag (ARDL), financial development, gas, oil, and coal use all contribute to ecological deterioration in Pakistan over the long and short terms. The usage of conventional energy sources for energy consumption is the main factor responsible for the environmental deterioration in Pakistan. Such regulations encourage businesses and households to employ renewable sources of power for energy needs, therefore reducing pollution problems.

Methodology

Our research is based on information from Pakistan's time series from 1989 to 2019. The World Development Indicator (Environment, Population, Gross Fixed Capital Formation, Trade Openness, Foreign Direct Investment) was used to gather the information. Gross Domestic Product was used in place of Economic Growth (GDP).

The present study considered different variables and their impact on economic growth in Pakistan. The study has formulated the following model,

Model

GDP =f (ENV, POP, GFCF, TO.FDI)

Where;

ENV= Environment (% of total fuel combustion)

GDP =Economic growth (annual %)
POP = population growth (Annual %)
FDI = Foreign direct investment (% of GDP)
TO = Trade openness (% of GDP)
GFCF = Gross fixed capital formation (% of GDP)

Economic growth is a dependent variable model. The variable used in the model of the present study are environment, foreign direct investment, gross fixed capital formation, population growth and trade openness are used as independent variables.

$$GDP = \alpha + \beta_1 ENV + \beta_2 POP + \beta_3 FDI + \beta_4 GFCF + \beta_5 TO + \mu_1$$

"Where, α the intercept and β_1, β_2, β_3, β_4, β_5, β_6 are the coefficients of the explanatory variables μ denotes the error term which represents omitted variables in the specified model.

Now obtain elasticity coefficients and remove the effects of outliers, the variables of the article were transformed into logarithm form"

$$LnY = \beta_0 + \beta_1 ENV + \beta_2 POP + \beta_3 FDI + \beta_4 GFCF + \beta_5 TO + \mu$$

Time series data are given in this chapter to demonstrate the link between dependent and independent variables. This chapter explains the approach used to look at the variables from 1989 to 2019. We'll look at the unit root to see if the data is stationary. After that, we'll talk about the ARDL technique, and finally, the error-correcting model.

The equation for the long-run relationship would be as follows.

$$Y = \alpha_0 + \alpha_1 \sum_{j=1}^{k} ENV_{t-j} + \alpha_2 \sum_{j=0}^{k} POP_{t-j} + \alpha_3 \sum_{j=0}^{k} FDI_{t-j} + \alpha_4 \sum_{j=0}^{k} GFCF_{t-j} + \alpha_5 \sum_{j=0}^{k} TO_{t-j} + \varepsilon_t$$

Table 1. Variables.

Variable	Measurement	Source of Data	Expected Sign
Economic Growth	Annual %	WDI	Dependent Variable
Environment	% of total fuel combustion	WDI	Positive
Foreign Direct Investment	% of GDP investment	WDI	Positive
Gross Fixed capital formation	% of GDP	WDI	Positive
Trade openness	% of GDP	WDI	Positive
Population Growth	Annual %	WDI	Positive

Result and Discussion

Investigating the characteristics of the model's variables is done using statistical information. The table provides the descriptive statistics for each parameter. Pakistan is included in the group, and the duration of the study runs from 1989 to 2019.

Table 2. Descriptive statistics.

Variable	Mean	STD	MIN	MAX	Median
GDP	6.328128	3.2607	-7.34842	14.20086	6.194415
Environment	102.2407	12.7430	60.52216	139.94	102.74
Population Growth	1.593530	0.615330	0.445800	2.856568	1.904530
FDI	2.0312	4.338	2.804	5.60 2	3.914
GFCF	92.65041	45.42164	32.74972	203.6234	76.02151
Trade	70.57043	61.2447	15.502626	220.4068	39.4105

Descriptive Statistics described

- Mean
- Standard Deviation
- Minimum
- Maximum
- Median

Table 3. Result of ADF.

Variables	T-statistic	P-value	Status
ENV	-3.021665	0.000	Level
GDP	-3.353380	0.001	Level
GFCF	-5.328913	0.002	1st difference
POP	-4.34717	0.012	Level
FDI	*-3.58769*	*0.001*	1st difference
TO	-4.963913	0.001	Level

This Table shows four variables ENV, GDP, POP, TO and two variables GFCG and FDI at 1st difference.

Table 4. Bounds Test.

F-Statics	95% I(0)	95%I(1)	90% I(0)	90% I(1)
4.594580	3.47	4.27	3.03	4.06

Null hypothesis: There is no long-run relationship that exists The F-statistic >upper critical value I(1)4.06 at 10% level.

Use the F statistic to check the combined association of factors. The upper limit, I(1) and lower limit, I(0) are used to make equal the value of the bound-test with the value of the F statistic. If the value of F statistics is higher than the upper limit, it shows that there is cointegration exists in current data. If the F-value exists between the critical values, the result will remain uncertain. The Ho of the F statistical test is that there is no cointegration. In the ARDL technique, a bound test is applied before displaying the cointegration between dependent variables and explanatory variables.

Table 5. ARDL.

Table 5. ARDL (1, 0, 0, 1, 0) Long Run Form Dependent variable: GDP		
Independent Variables	Coefficient	Prob.
ENV	1.950367	0.0646
GFCF	0.002616	0.0160
POP	0.04692	0.0005
TO	0.797648	0.8037
FDI	3.338050	0.0300

Table 4 exhibits the results of the bound test for the cointegration, indicating that the value of the F-statistic is greater than the critical value. This raises the existence of co-

integration. That is, the environment has a long-run association with the descriptive variables (GDP, GFCF, FDI, TO, POP) for Pakistan. Results of Bound test estimation advances to estimate the long-run relationship.

Discussion

The relationship between economic growth and the environment is seen in Table 5. Environmental improvement and economic prosperity go hand in hand. These results show that a 1% increase in environmental quality leads Pakistan's economic growth to increase by 1.950367. These results are consistent with the study of Fakher and Abedi (2017) as they examined how environmental quality will decline initially as a result of economic development or expansion but will eventually improve. Natural stress will be greater throughout the first stages of development in connection to higher income levels, and it will slow as GDP increases. Foreign direct investment in the estimated model indicates a direct correlation to economic growth as the coefficient of this independent variable demonstrates a positive sign showing that economic growth increasing dramatically because of more foreign investment. Results showed that a one percent increase in Foreign direct investment the economic growth by 3.338050. These results are in line with the findings of Chakraborty (2001) as they found that gains in output, jobs, value creation, and exporting immediately affect international investments, which in turn directly raises Growth. For instance, firms strive a person's income, and the increased income is indirectly reflected in the Gross domestic product. Trade openness is showing a direct relationship with economic growth as the independent variable's coefficient has a positive sign indicating that a 1% change in trade openness level leads to a 0.797648 increase in economic growth. Solid investing opportunities arise and more items are created when commerce is open. The efficiency of the industry would raise as a result, and more exports would boost economic development. Various philosophers (Krueger, 1978; Bhagwati, 1978). Economic expansion and gross fixed capital creation are positively and significantly correlated. Economic growth increases by 0.002616 when Gross Fixed Capital Formation increases by one unit. Gross fixed asset creation has an impact on the economy, indicating that economic expansion does not consistently encourage investment from abroad. But according to the contemporary economic growth theory, investment has an impact on both per capita production and overall growth (De Mello, 1997).

Conclusion

Through using ARDL bound tests approach suggested by Shin & Smith, the exploratory study assessed the relationship between the environment and other chosen variables, including population growth, foreign direct investment, gross fixed capital creation, and trade openness in Pakistan (2001). The primary objectives of the study are to determine the impact of environmental quality on economic growth in Pakistan and based on the results, to make recommendations for improving the environment. As far as we are aware, no research has been done on the effects of the environment on economic growth in Pakistan. Data from 1990 through 2020 was used for this objective. These measures' data were compiled from international development indicators. The results show that, with economic growth as the parameter, there is a founder among the variables used for

the model. According to computed long-run association coefficients, trade openness has a favorable and considerable impact on income progress at a level of 5%. Results also showed that the environmental performance index had a beneficial and substantial effect on industrial growth. Approximately, economic expansion will increase based on a quantity of 1.51. This study made the following recommendations.

- Government should increase awareness to control the population that causes environmental degradation.
- Government should provide a better environment for investment and promote foreign investment.
- Government should promote free trade. That will be helpful for economic growth.

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