

*Original Research Article*

# Total Natural Resources Rent Relation with Economic Growth: The Case of Pakistan and India

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## Abstract

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The GDP per capita are some of the most important parts of today's global economy. In world all countries depend on GDP per capita for economic growth and indeed, the role of total natural resources rent are very important in development of economic growth. This study is about the total natural resources rent relationship with economic growth in case of Pakistan and India. In this investigation utilized forty seven years annually information and secondary time series data is used and test period from January 1970 to December 2017. ADF test is used to check the integration level of variables. And then for to check the relationship co-integration, regression, and VECM tests are used. The study concluded that total natural resources have positive and significant effect on Pakistan and India GDP per capita. Co-integration analysis depict there are 2 co-integrated equation of relationship between variables.

**Keywords:** GDP, ADF, Co-integration, VECM, Per Capita and Pakistan

## INTRODUCTION

### Background of the study

This particular study is about the total natural resources rent relationship with economic growth in case of Pakistan and India. Total natural resources rents are the addition of oil rents, gas rents, coal rents (hard and soft), mineral rents, and forest rents. In some countries earnings from natural resources, particularly from fossil fuels and minerals, account for a large share of gross domestic product, and far of those earnings are available in the shape of economic rents revenues higher than the value of extracting the resources. Natural resources bring about to economic rents as a result of they're not made. For made merchandise and services competitive forces expand offer till economic profits are driven to zero, however natural resources in fastened offer usually command returns well in far more than their value of production. Rents from non-renewable resources fossil fuels and minerals in addition as rents from overharvesting of forests indicate the liquidation of a country's capital stock. When countries use such rents to support current consumption instead of to take a position in new capital to switch what's being employed up, they

are, in effect, borrowing against their future. Is it smart for a rustic to be made in natural resources? Superficially, the solution to the present question would clearly appear to be "yes". How may it ever be negative to own one thing additionally to labor and created capital? However may it's negative to own one thing valuable "for free"? however, the solution is way from that easy and one will comparatively quickly come back up with counter-arguments: "Having natural resources takes away incentives to develop different area unites of the economy that are doubtless additional vital for long-standing time growth"; "Natural resource-income will cause corruption or be a supply of conflict", etc.

About 3.5 billion individuals located in wealthy countries of oil, gas or minerals. Several of those countries suffer from economic condition, corruption and clash stemming from weak governance. Too often, mineral, oil and gas resources became a supply of conflict instead of chance (Mehrara and Baghbanpour, 2015). Mineral may be a Non-renewable helpful resource play a dominant operate in eighty one countries, along accounting for region of world gross domestic product, 1/2 world public and nearly seventieth of those in severe

financial condition. Oil may be a non-renewable resources and strategic trade goods, and play an important role to the boom of all economies. Several growing nations square measure passionate about exports of raw materials as a supply of financial gain. Mehrara and Baghbanpour (2015). Oil sales have a crucial position in the Pakistan and India economic system. Oil prices were constantly low for properly over a 12 months and a 1/2 now, however as the April 2016 global economic Outlook will report, the broadly expected "shot inside the arm" for the worldwide financial system has yet to materialize. We argue that, satirically, global blessings from low expenses will probably appear handiest after fees have recovered fairly, and superior economies have made greater progress surmounting the cutting-edge low interest fee surroundings.

The natural assets rents' estimates established are calculated because the difference among the charge of a goods and the average value of engineering it. That is completed by means that of estimating the podium charge of units of specific commodities and subtracting estimates of average unit fees of extraction or harvest home prices (including a normal come on capital). Those unit rents ar then accelerated by exploitation the physical parts international locations extract or harvest to make a decision the rents for each artifact as a proportion of gross home product (GDP). Useful resource lease can be divided between depletion and go back to herbal capital (Thorvaldur and Gylfason, 2004).

### Research problem

The problem which is focused through researcher on this specific study to know about the connection between total natural sources rents and economic growth in case of Pakistan and India. Have an effect on the monetary increase of a country to a large extent. Natural assets are the primary constructing blocks of a country. Mineral resources includes inclusive of diamonds, coal, fossil fuels and many others. Natural sources in excess, which includes crops, wooden, minerals and so on. It can be exported to other parts of the sector or to other countries provide them with a stable economic system for improvement. Without each other, the economic development of the any country would absolutely is bogged down. However green utilization of natural resources relies upon at the skills and capabilities of human resource, technology used and availability of budget. There is not necessarily any actual correlation a number of the international locations of the world in which an exquisite deal of wealth are extracted from the earth the human beings stay in abject poverty. So without understanding about dating of overall natural resources and monetary boom inside a country and with our neighbor's countries. They said vices are possibly to maintain and slowdown the fulfillment of the use's set

dreams. Need arises to have a look at the full natural assets and economic increase in Pakistan and one of most important our neighbor India, consequently proposed this study.

### Research Objective

This research study focuses to analyze the relationship between total natural resources rent and economics. So, our research study's specific objectives are;

- To measure the connection among overall natural resources rent and economic growth of Pakistan.
- To have a look at the total natural resources rent (%GDP)relationship with monetary economic growth of India.
- To calculate the relationship among overall natural sources lease via Pakistan and India with each international locations GDP per capita.

### Significance of the study

The present look at specializes in relationship between general natural assets and economic boom in Pakistan and India. At some stage in beyond a few a long time general natural resources rent had been not proved properly for the economic boom. And overall natural sources hire substantially impact on the boom of the any country. In a great deal, volatility in charges witnessed because of great monetary crises of the arena. After knowing approximately overall natural sources rent and its relation with economy of any country, the policy makers in both international locations take it into attention whilst making guidelines and taking important choices to the economic growth. So this interesting that's why will offer proper photo and facts for character investor, establishments, government and the opposite human beings of Pakistan and India.

### Literature review

A literature evaluation examines scholarly articles, books, dissertation, organization discussion complaints and other resources which might be relevant to a selected problem, vicinity of research. This unique have a look at opinions the preceding literature as;

### Effect of Total Natural Resources Rents on Economic Growth of Pakistan

Stijns (2000), Gylfason and Thorvaldur (2004) said that however total natural resources rent result on economic process of the country and additionally the GDP. They tend to examine the connection between economic

process and total natural resources rent for the Asian country and Asian nation economies by the victimization annual date set over the amount of 1970-2012. Many developing countries are heavily dependent on Primary products as their main source of export revenues. The natural resources, particularly oil plays very important role within the economy of developing countries and it's important to point out however natural resources might have an effect on long haul economic process and therefore the channel that the connection relies upon. Indeed, the oil and gas industry has been the engine of economic growth, directly affecting public development projects, the government's annual budget, and most foreign exchange sources. Researchers includes rate of exchange, gross domestic product per capita, and FDI, as independent variables and exports and total natural resources as variable quantity and apply ADF unit route take a look at, and also the multiple simple regression model to live impact of freelance variables on dependent variables. and the several researchers had realize that the bigger impact on human capital, financial condition reduction conjointly on political economy stability and FDI has positive however insignificant relationship with value of Pakistan by (Thorvaldur a. G., 2001; Mohsen Mehrara, 2015). Empirically and statically they discovered that there is robust fine impact of general natural sources lease on GDP.

Comparable research had been carried out by using various researchers with exceptional subjects, in this research aimed to calculate impact of natural resources on financial increase in Pakistan by Mehar et al. (2013), Gylfason and Thorvaldur (2004) and Mohsen (2015) who took explanatory variables as overall natural resources, FDI, inflation, gross constant capital formation, human capital, and real GDP as based variable; researchers nearly same variables were used same version named as Johansson co-integration model for measuring impact of independent variables on based variable by means of (Ahmad and Hassan, 2015). Concluded that alternate liberalization, capital formation, and human capital has nice and enormous courting with GDP and FDI, inflation has poor impact on GDP of Pakistan.

Many researchers by Siddiqui, (2004) and Munir and Jamal (2009) used equal name to investigates overseas Direct investment, natural assets and monetary growth; used annual information for developing international locations from 1971-2000; fixed have an effect on regression version was used in this study; end result indicates that herbal resources have huge relationship and overseas direct funding have insignificant determinate of growth; the important thing finding of this article is that natural sources is useful for increase; in developing international locations different variable overseas Direct investment does not play the essential role in boom (Munir and Jamal, 2009).

## Hypothesis

**Ho:** Total natural resources rent by Pakistan has not significant and positive relationship with GDP per capita of Pakistan.

**H1:** Total natural resources rent by Pakistan has significant and positive relationship with GDP per capita of Pakistan.

## Effect of Total Natural Resources Rents on Economic Growth of India

This interesting research have been performed by Agnani and Izay (2008) and Ahmad and Hassan (2015) that proven the natural sources and human capital has fine / massive relationship with economics sector increase; for this reason research worker use automobile regression distribution lag (ARDL) version for deciding long haul qualitative analysis between variables consistent with this version conclude that natural sources and human capital has long haul tremendous relationship with money growth once that used farmer relation take a look at, results of this flavor suggests that inform direct causative relationship of overall natural assets rent, human capital and physical capital on agricultural gross home product. A causative relation between economic process and oil is excellent and life-sized. Considering the very fact that exports square measure an element of value, growing exports essentially will increase value (Stijns, 2000).

Several authors were conducted similar studies by Agnani and Izay (2008), Ahmad and Hassan (2015) and Benedictow et al. (2010). Overall herbal resources choice is depend on many factors and FDI influx are affected by many elements as properly, so for determine the herbal sources and their effect on FDI inflow for the length 1990-2008; following variable were used GDP, in step with capita, change fee and political as determinants of FDI, these kind of facts offer an instantaneous causality check between structured variable GDP consistent with capita and independent variable (total natural assets) after amassing all these records researcher used co integration and regression model for long term dating (Ahmad and Hassan, 2015) concludes that herbal assets has sizable effect on FDI inflow and show high-quality courting among natural resources and FDI influx and additionally specific that a few other elements like alternate fee, GDP, political instability additionally affecting influx positively (Mohsen, 2015).

Siddiqui, (2004) and Stijns, (2000) stated that how total herbal sources hire effect on monetary increase of the United States of America and additionally the GDP. Researchers includes change rate, GDP per capita, and FDI, as impartial variable and exports and total herbal sources as established variable and follow the version, method used for trying out the causality among financial growth and energy use and records issues are discussed

on this section., and the more than one linear regression version to measure have an effect on of unbiased variables on dependent variables. And the various researchers have greater effect on human capital, poverty discount additionally on microeconomic balance and FDI has fine however insignificant courting with GDP of Pakistan with the aid of (Thorvaldur a. G., 2001; Mohsen Mehrara, 2015). Empirically and statically researchers find that there is robust superb impact of overall natural sources hire on GDP.

Gylfason and Thorvaldur (2004), Siddiqui (2004), Agnani and Izay (2008) check out the relationship between enterprise values introduced, herbal sources and economic growth of Pakistan; look into the long term effect of herbal resources and financial boom; facts turned into used 1979-2009; author used the econometrics version ordinary Least square and long run co integration the entire variable expressed with logarithm. OLS changed into used to test the primary difference in variable and co integration turned into used to check the relationship among those variable overall herbal assets has high-quality and importance impact on financial boom the locating is not most effective display the superb and significance in sources and growth however importance contribution in industrial price delivered.

## Hypothesis

**Ho:** Total natural resources rent by India has not significant and positive relationship with GDP per capita of India.

**H2:** Total natural resources rent by India has not significant and positive relationship with GDP per capita of India.

## RESEARCH DESIGN AND METHODOLOGY

In this research study, research design is quantitative nature that is particularized following head. The primary theme is to detecting the econometric techniques and methodology.

### Time Period, Nature and Source of Data

To explore the relationship among Total Natural Resources Rent and GDP of Pakistan and India quantitative, time series and secondary data is used. The researcher used annually data which collected from official websites of State Bank of Pakistan, International Trade Center and World Development Indicator and Index Mundi for the period of 47 years from 1970 to 2017.

And unit of analysis of study is % because both variables' data for both country taken as %. Total Natural Resources Rent as % of GDP and GDP as % of GDP Per Capita.

## Methodology

This area holds the essential approaches and whole methodology to fulfill the objective of exploration study. Time series data is analyzed by using E-Views. Then other analysis which are used is used for stationary of data Augmented Dickey Fuller Test (ADFT) by Fuller (1979). Rossi (2014) when data is stationary at same order, than check the Co-integration technique that causes the direction of long run relationship between variables. Haj and Kacem (2014) the next analysis is regression which is used to generate an equation to describe the statistical relationship between one or more predictor variables and the response variable. If the data is not stationary on same level then Auto Regressive Detributive Lag (ARDL) model is applied to analyze the short and long term relation. Andreia and Andrei (2014) VECM is applied when data stationary at same level to analyze the short dynamics between data So this study use VECM model of Analysis because variables are stationary at same levels.

## RESULTS AND INTERPRETATIONS

### Unit root test

In statistics, a unit root test tests whether a time series variable is non-stationary and possesses a unit root. The stationary of the data means that there is no effect of the previous effect. According to results of unit roots, ADF has shown that data were become stationary at the level and first difference.

The table 1 below shows the results of stationary analysis of Pakistan and India and about the Pakistan unit root test shows that the dependent variable of GDP per capita is stationary at level and first difference also. The independent variable total natural resources rent are stationary at level and on the first difference there is also stationary. Also above table shows the result about India and unit root test demonstrates that the dependent variable GDP per capita is stationary at the level and also first difference. The independent variable total natural resources rent of India is stationary at the level and first difference as well. According to all above results both included variables of both countries are stationary at level and at first difference. So there are different analysis for data that is stationary at level and at first, second difference.

Table 1. Unit Root Test

Country	Unit Root Tests	Variables	Test-Statistic	Probability	Critical Value			
					1%	5%	10%	
Pakistan	ADF Test	GDP Per Capita	At Level	-6.6751	0.0022	-3.58850	-2.92973	-2.60306
			First Diff.	-11.095	0.0000	-3.59246	-2.93140	-2.60394
		Total Natural Resources Rent	At Level	-2.5714	0.0065	-3.58850	-2.92973	-2.60306
			First Diff.	-8.7130	0.0000	-3.5924	-2.93140	-2.60394
		GDP Per Capita	At Level	-5.2787	0.0001	-3.58850	-2.92973	-2.60306
			First Diff.	-8.8543	0.0000	-3.59661	-2.93315	-2.60486
India	ADF Test	Total Natural Resources Rent	At Level	-3.2196	0.0254	-3.58850	-2.92973	-2.60306
			First Diff.	-8.8608	0.0000	-3.59246	-2.93140	-2.60394

Table 2. Co-integration test of Pakistan  
Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen-value+	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.344953	24.36796	15.49471	0.0018
At most 1 *	0.133808	6.176881	3.841466	0.0129

Trace test indicates 2 co integrating ex. n(s) at the 0.05 level

\*denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Hag-Michelins (1999) p-values

Table 3. Co-integration test of India  
Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen-value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.268379	20.16746	15.49471	0.0092
At most 1 *	0.144883	6.730250	3.841466	0.0095

Trace test indicates 2 co integrating Esq. n(s) at the 0.05 level

\*denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

## Co-integration

Co-integration analysis is used for the measurement of long run relationship between variables with respect to the non-stationary property of total natural resources rent and GDP (Haj and Kacem, 2014).

## Hypotheses

H0 = the lag level series are not Co-integrated

H1 = the log level series are Co-integrated

Table 2 unrestricted Co-integration rank test are consist of these column country, hypothesized number of CE, Eigen-value, trace statistic, critical value and probability

respectively. To check the long term relationship between variable trace tables is used to check the co integration. The probability and trace statistics value are considered. The thumb rule is that if probability is less than 0.05 then the trace statistics value more than critical and Eigen value its mean that is co integration. In the above table all the variables probability is less than 0.05 that's why all these are co integration. And trace statistics is also eligible to measure the co integration. In above all cases the trace statistics are more than the Eigen value and the probability is also less than 0.05 then it will be co integration and above table shows that there are 3 co integration equations.

Table 3 unrestricted Co-integration rank test consist of these column country, hypothesized number of CE, Eigen-value, trace statistic, critical value and

**Table 4.** Regression analysis of Pakistan OLS (least squares method)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.462592	0.817589	1.788908	0.0807
Pakistan resources rent	0.155338	0.174261	0.891414	0.0477
Durbin-Watson stat				1.714128
R-squared	0.58144	F-statistic		0.794618
Adjusted R-squared	-0.00469	Prob. (F-statistic)		0.047668

Proposed Equation:  $GDP_{pak} = \beta_0 + \beta_1 \text{ total natural resources rent}$

Fitted Equation:  $GDP_{pak} = 1.462592 + 0.155338TNR$

For this study:

GDP = Gross Domestic Product

TNR = Total natural resources rent

PAK = Pakistan

$\beta$  = Parameters of variables

**Table 5.** Regression analysis of India OLS (least squares method)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.749046	1.312191	1.332920	0.1896
India resources rent	0.362716	0.252296	1.437659	0.0578
Durbin-Watson stat				1.756431
R-squared	0.45862	F-statistic		2.066864
Adjusted R-squared	0.023673	Prob. (F-statistic)		0.057769

Proposed Equation:  $GDP_{india} = \beta_0 + \beta_1 \text{ total natural resources rent}$

Fitted Equation:  $GDP_{India} = 1.749046 + 0.362716TNR$

For this study:

GDP = Gross Domestic Product

TNR = Total natural resources rent

Ind = India

$\beta$  = Parameters of variables

probability respectively. Above mentioned table reports the results of Johansen's co integration test for GDP and Total natural resources rent. Results indicate that at 5% significance level, prob. Value is less than 0.05 and T-statistics value greater than Eigen-value and critical value so that's why said that there is two co integrating equation among said variables which means that there is long run relation between variables is exist.

### Regression Analysis

Golberg and Cho (2010) regression analysis is employed to model the link between a response variable and one or a lot of predictor variables. Multivariate analysis generates an equation to explain the applied math relationship between one or a lot of predictor variables and therefore the response variable.

### Hypothesis

**Ho:** Independent variable does not have positive and significant impact on dependent variable.

**H1:** Independent variable does have positive and significant impact on dependent variable.

The result of table 4 shows that R squares is 0.58 which is equal to 58% which means that almost 58% of variation in GDP per capita explained by included independent variable and remaining percentage which is 42% explained by the other independent variable. This study also checks the autocorrelation assumption through "Durban-Watson" test. In our analysis the value of DW is 1.714 that shows the no any auto correlation between the variables. F. Statistics value is 0.794618 and its prob. Value is 0.047668 which is less than 0.05 shown that our model is good fit. The result of table 4 shows that value of constant being 1.462592 explains that if all other variables are taken constant or consider 0 even then there is GDP per capita of the country of 1.462592%. If 1% increases in total natural resources it has effect 0.155338 increases in GDP of Pakistan (In case of this study t value shows that model is best fit and all beta values reflect that two variables in the study out of three are highly significant.)

The result of table 5 shows that R squares is 0.45 which is equal to 45% which means that almost 45% of

**Table 6.** Vector Error Correction Estimates (Pakistan)

<b>Error Correction:</b>	<b>D(Pakistan GDP)</b>	<b>D(Pakistan resources rent)</b>
CointEq1	-0.600878 [-3.15255]	-0.119244 [-0.94265]
D(Pakistan GDP(-1))	-0.268994 [-1.59074]	0.213270 [ 1.90030]
D(Pakistan GDP(-2))	-0.144362 [-1.16190]	0.136349 [ 1.65350]
D(Pakistan resources rent (-1))	0.403773 [ 1.62872]	-0.315497 [-1.91752]
D(Pakistan resources rent (-2))	0.140409 [ 0.56306]	-0.01727 [-0.10435]
C	0.068404 [ 0.23527]	0.081135 [ 0.42046]

Standard errors in ( ) and t-statistics in [ ]

**Table 7.** Vector Error Correction Estimates (India)

<b>Error Correction:</b>	<b>D(India GDP)</b>	<b>D(India resources rent)</b>
CointEq1	-0.127773 [-1.50561]	-0.095732 [-2.58773]
D(India GDP(-1))	-0.702667 [-4.61723]	0.177858 [ 2.68100]
D(India GDP(-2))	-0.374096 [-2.56625]	0.163894 [ 2.57911]
D(India resources rent (-1))	-0.060073 [-0.16661]	-0.204299 [-1.29978]
D(India resources rent (-2))	0.023817 [ 0.06921]	0.056169 [ 0.37442]
C	0.324494 [ 0.65983]	0.065303 [ 0.30461]

Standard errors in ( ) & t-statistics in [ ]

variation in GDP per capita explained by included independent variable and remaining percentage which is 55% show the other independent variable. This study also checks the autocorrelation assumption through “Durban–Watson” test. In our analysis the value of DW is 1.756431 that shows the no any auto correlation between the variables. F. Statistics value is 0.057769 and its prob. Value is less than 0.05 which shown that our model is good fit. The result of table 5 shows that value of constant being 1.749046 explains that if all other variables are taken constant or consider 0 even then there is GDP per capita of the country of 1.749046%. If 1% increases in total natural resources it has effect 0.362716increases in GDP of India (In case of this study t value shows that model is best fit and all beta values reflect that two variables in the study out of three are highly significant.)

### Vector Error Correction Model

A vector error correction (VEC) model could be a restricted volt-ampere designed to be used with non-stationary series that area unit illustrious to be co integrated. The VEC has co integration relations engineered into the specification in order that it restricts the long-term behavior of the endogenous variables to converge to their co group action relationships whereas providing short-term adjustment dynamics. The co integration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. Researcher initially test for the rank of the co integration using the methodology by Johansen (1988) (Sreedharan, 2004).

Error correction mechanism has been applied during

this study to capture the short run dynamics among involved variables inside the context of long-standing time relationship. Coefficients of co integration equations show the speed of adjustment just in case of short run state of affairs. In case of GDP, coefficient of co integrating equation is significant indicating that adjustment of disequilibrium is due to first error correction term. Column 1 indicates that GDP adjusted by almost 60% in one day and it takes almost 294 days ( $1/0.600878 = 1.6642$ ) to eliminate completely the disequilibrium. In case of Total natural resources rent, coefficient of co integrating equation is significant indicating that adjustment of disequilibrium is due to first error correction term. Coefficient of first error correction term indicates that almost 11% of disequilibrium is adjusted in one day and it takes almost 410 days (1 year and 45 days) to completely eliminate short run disequilibrium. However, in case of GDP, and total natural resources rent coefficient of error correction term is insignificant indicating that error correction term fails to make adjustments significantly (Table 6).

Table 7 in case of GDP, coefficient of co integrating equation is significant indicating that adjustment of disequilibrium is due to first error correction term. Column 1 indicates that GDP adjusted by almost 12% in one day and it takes almost 294 days ( $1/0.127773 = 7.6642$ ) to eliminate completely the disequilibrium, same interpretation In case of total natural resources rent.

## CONCLUSION

The relationship between total natural resources rent and economic growth in case of Pakistan and India has captured a mind of researchers to investigate the effect of total natural resources rent and GDP on Pakistan, and India. The purpose of this study verify and find out effect of total natural resources rent on economy of selected two countries Pakistan and India. After that the stationary test use to check the stationary or not stationary of variables in at level, and first difference. Analysis of stationary shows all variables stationary at first difference. Co-integration test result shows that there are three co integration equations exists in Pakistan, and India. Then next test used Regression to check the comprehend the connection between autonomous factors and a needy variables and result shows that total natural resources rent has positive effect on Pakistan and India GDP and also demonstrate result has positive effect on Pakistan and India economy. The next test used vector

correction error model (VCEM) check the significant of the data. And our data is insignificant in Pakistan and significant in India. The overall this study concluded that all the null hypotheses reject in favor of alternative hypotheses.

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