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Impact of Corruption on Economic Growth in Pakistan: A Comparative Approach

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Abstract

This work is intended to find a relationship between corruption and economic growth. Economic growth is viewed in terms of per capita GDP and corruption is quantified as corruption perception index (CPI) published by Transparency International annually. Population, investment, total public expenditures, and expenditure in education by government are used as the determinants of GDP. Study period expands from 1995 to 2019. Solow growth model is modified for the purpose to incorporate corruption with the macroeconomic variables of economic growth. Auto Regressive Distributive Lag (ARDL) Bounds Testing methodology is used for the analysis. The results authentic ate a long run relation amid corruption and economic growth in the economy of Pakistan. The estimates signify that corruption poses negative effects on per capita GDP and thus diminishes the economic growth of the country.

Keywords: Corruption, Economic Growth, Government Expenditures, Growth Model, Bound Testing.

JEL Codes: N55, O13, O44, O47.

1. Introduction

The phenomenon of corruption is a rational problem for human beings in their economic concerns. Corruption imposes

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adverse impacts on the economic progress all over the world. It is too hard to define corruption in its true sense. The dimensions and outcomes of corruption are changing rapidly. This fact makes it difficult to define corruption in some concise terms. The issue of corruption has its severe importance all through the world. Prevalence of corruption is a curse for whole world, but it is a great menace for the developing nations. With the advancement of people's awareness, corruption is main concern of hampering the economic development. Many empirical and theoretical studies have been conducted on the concerns of corruption in the economic growth of a country.

With major devastating effects of corruption on economic growth, corruption may also improve the extent of economic growth because it it relaxes fruitless and rigid regulations imposed by government (Leite and Weidman, 1999). In the last two decades of twentieth century, many economists have set mechanisms amid corruption and economic growth. On the basis of data, they proved that corruption hinders economic efficiency. Famous Queue Model proves that bureaucracy employ corrupt practices in allocating business licenses to the firms (Lui. 1996). On the similar grounds, Auction Model specifies that government officials gather bribe money during the bidding procedures of contracts. These actions push out the competent firms and thus development and economic growth can't be achieved at a desired level of the economy (Beck and Maher, 1986).

The phenomenon of corruption is hard to detect and difficult to counter. The government needs the establishment of fair and transparent systems of governance to curb corruption. Anticorruption rules and laws can set a transparent environment for free of corruption execution of the economy (Tullock, 1996). On this front, Pakistan is really malfunctioning so far. Corruption is live with diverse forms in various sectors of the economy. Major kinds of corruption prevailing in the Pakistani economy are bribery, nepotism and favoritism (Chene, 2008). Unfortunately, Pakistani politics has in-built lope holes for corruption. Politicians make decisions and formulate laws to cater their personal benefits and not the interests of the nation. This gives rise to the corruption favorable scenario (Abbey, 2005).

In economics terms, corruption leads to lower labor productivity, shortage of investment and reduced levels of

economic growth. Economic activities cannot be effectively run in a corrupt national economic system. Corruption hampers foreign direct investment (FDI), increases public expenditures on infrastructure and ultimately slows down the pace of economic growth and development (Ouattara, 2004). Thus, there is found an inverse relationship between corruption and economic growth.

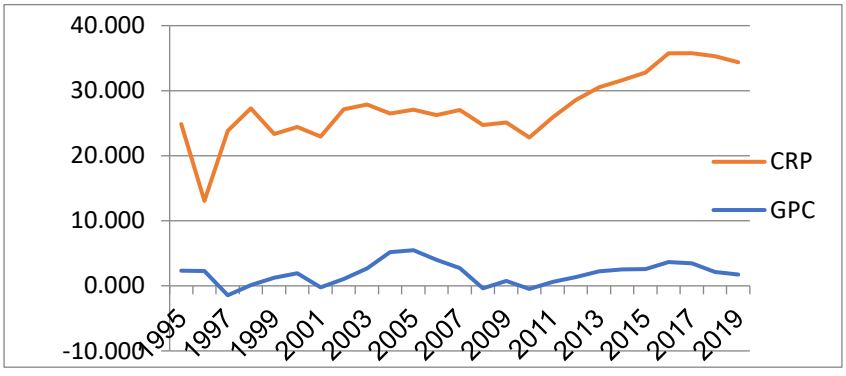
Corruption is a menace to economic growth and development. Many studies on corruption and economic growth have revealed negative liaison amid the two phenomena. Thus, the concern requires economic insight in quantifying the impacts of corruption on economic growth. Pakistan is a developing country. It is in the flux of many economic difficulties. This study analyses the overwhelming impacts of corruption on the growth levels of Pakistani economy. Then the analysis derives certain results to give policy recommendations for the corruption free progress of the nation.

A view of corruption and economic growth in Pakistan is displayed in the following figure. Corruption is in the form of corruption perception index and economic growth is taken as percentage change in per capita GDP of the country. The figure-1 traces a vivid inverse pattern for both of the comparative study variables. Per capita GDP is denoted by GCP and corruption in shown as CRP here.

Therefore, this research has been conducted for filling the above-stated gap in the literature. Specifically, this research aims to achieve the following research objectives:

1. To find the possible impact of corruption on economic growth of Pakistan.
2. To quantify the probable extent of corruption affected economic sector.
3. To substantiate policy recommendations for the economic development of the country.

Figure 1: ***A View of per Capita GDP growth and Corruption Index in Pakistan***



To bridge up the gaps in the existing literature this study is produced. The study focuses on the economic impacts of corruption in Pakistan rather than the political effects. The study analyses the impact of corruption on economic growth through its impacts on public expenditures, investment, population, and government expenses on education. The study d this study has its objectives on finding a cause and effect discusses Pakistan as an individual country and it visualize the economy of Pakistan as a whole. The study covers a long period of 25 years from 1995 to 2019. The econometric techniques of bounds testing have extensively been used in the study on overall available data. Enough range of variables possible for running the tests has been employed here. These are the core points for launching the present study. With long range data and effective econometric methodology, it is expected that the study will be a reasonable addition to the existing body of knowledge in the field.

This research will be useful for the government and relevant bodies so they can maintain a respectable rate of economic growth by curtailing or monitoring corruption. This section has presented the introduction of the research. Successively, the literature review and hypotheses development are presented in Section two which is followed by research methodology in Section three. Section four presents the results of the analysis and discussion, conclusion, and policy recommendations are given in Section five.

2. Literature Review

2.1 Natural Resources and Economic Growth

Natural resource management (NRM) involves not only the plan of usage of the land, but it also involves the maintenance of ecology, conservation of biodiversity, and air quality, along with the planning of soil and water management. By Day and Hall (2016), contemporary economists of environmental sciences also incorporate different other problems to ensure the future sustainability of the industries involving forestry, fisheries, tourism, mining, and agriculture. Generally, the availability of natural resources is the function of the supply and demand of resources. The demand side depicts an increasing trend as an outcome of the efforts of the countries to acquire improved standards of living and higher growth rates in the economy. On the other hand, the supply side is more often predictable. The outcome can be the scarcity of various natural resources that causes the risks of approaching some point with no return when referring to environmental degradation. This outcome would not only be the depletion of the ecosystem, but it also augments the chances of exploration for stocks of new resources that would give more damage to the economic growth in ASEAN countries (Lattre-Gasquet & Moreau, 2018; Oyedepo et al., 2018). Therefore, effective and efficient management of natural resources has become very important for the economic growth of countries. Since its inception in the year 1967, the ASEAN countries have been striving to make an acceleration in economic growth, more regional peace, social progress, and stability through increasing cooperation, trust, and interpretation among different states (Georgescu-Roegen, 1979). Over time, the ASEAN countries have widened the given scope and have made expansion in the horizon of practices to get more developed. As part of the given process, with an approach to get better economic growth while promoting green and clean environment through giving protection to the natural resource base of ASEAN countries, ASEAN Socio-Cultural Community (ASCC) was incorporated within ASEAN countries to ensure better economic growth. There were around 11 different factors with 98 action plans for accomplishing the objectives linked with the given features. However, it has been identified in the research of Georgescu-Roegen (1979) that even after the implementation of

these action plans, still, natural resource depletion is harming the economic growth of ASEAN countries. The proper use of these natural resources can, however, make a positive impact on economic growth. Thus, the following hypothesis is formulated to test the effect of natural resource depletion on economic growth in ASEAN countries.

H_1: The natural resource depletion significantly affects the economic growth of ASEAN countries.

2.2 Minerals and Economic Growth

The ASEAN counties are endowed with more of the natural resources, involving different energy and mineral resources. The ASEAN countries have a higher reserve share of some of the minerals. Despite having a smaller share in the GDP of the region, there is more significance in the mineral sector within ASEAN countries. Strong economic development within the region and around the globe is increasing the demand for mineral resources in most of the countries and is creating more opportunities and incentives for ASEAN countries for commercializing the mineral reserves. The production of minerals accounted for a lesser share of GDP in ASEAN countries, at almost 0.9% in the year 2015, while exports were around 0.7%. The share of minerals development to GDP was highest in Indonesia (around 2% of total GDP in the year 2015), Myanmar (0.7%), and the Philippines (0.8%) (Ghose, 2016). Minerals development within ASEAN countries was valued in the year 2015 at the US $5.9 (Hartley & Medlock III, 2017). On the other hand, the trade of ASEAN minerals got valued at US $10.5 in the year 2016 as claimed by He and Pang (2016). Growing activities of the world economy and development of industries in the previous few decades have increased the requirement for minerals internationally. In current years, enhanced consumption by countries of Asia like India and China has boosted the demand for minerals and costs (Landrigan et al., 2018). Therefore, giving opportunities and incentives to ASEAN member countries to do commercialization of reserves of minerals (Roumasset, Ravago, Jandoc, & Arellano, 2016; Shahbaz, Farhani, & Ozturk, 2015; Shi, Wang, Chen, & Huisingh, 2016; Simpson, 2017). The leaders of ASEAN countries called for integrating action programs that will further increase investment and trade in minerals of the industry

to facilitate the industrialization of member countries. It complements the thrust of ASEAN countries in determining the ASEAN Free Trade Area (AFTA) and it continues creating a conducive environment for the participation of the private sector through making processes and rules transparent. The Government and heads of the State of ASEAN countries in the year 1997 developed the ASEAN Vision 2020 as provided by Jack, Uchechukwu, Azubuike, and Akujobi (2016) to increase the intra-ASEAN investment and trade in sectors of minerals and to make a contribution towards technological competent ASEAN. This will in turn increase the economic growth of the country. Following hypothesis is formulated in line with the preceding discussion:

H_2: There is a significant effect of minerals depletion on the economic growth of ASEAN countries.

2.3 Energy Depletion and Economic Growth

For supplementing the developing requirement of energy, the International Energy Agency (IEA) mentioned in the Outlook 2017 of ASEAN countries that the requirement for coal and oil is expected to get augmented in current years. The growing dependency over coal and oil has exerted pressure in energy depletion has become the major concern. The IEA stated that energy depletion could become the major problem for ASEAN countries in the future if it will continue deteriorating itself as an importer of energy than being the producer of energy. The concern for energy depletion is not only about the affordability for customers, but the government too. With the rising requirement for energy, the oil demand is expected to get an upsurge to around 6.6 million barrels from 4.7 million barrels per day as stated by Jack et al. (2016). The ASEAN countries are quite popular for rich fields of oil, however, now a depletion is seen in resources at a faster rate. Aside from Thailand and Brunei, who are the biggest developers of oil, Vietnam, Indonesia and Malaysia are having a tougher time in keeping up with the developing pace of demand of oil in the given area (Sonwani & Maurya, 2018; Tay, Lee, & Yi, 2017). By Juma and Miraji (2018); (Kamble, 2019), these ASEAN countries have got transformed into oil importers rather than being its exporters. It is assumed that imports of crude oil will more even than double by the year 2040. Fulfilling the demand for

energy by imports would place more strain on trade balances and expenditure of the governments. With an increase in imports of oil, the ASEAN countries are expected to do the registration of total deficit in the trade of energy of more than US$300 billion in the year 2040 (Khan et al., 2019). The burden would make a worse influence on countries that will do employment of oil subsidies like Malaysia, Thailand, and Indonesia. The consumers do not consider this, but the government will realize the burden to import of oil with additional cost required to subsidize it for citizens. That is why, the government of ASEAN countries should reform some policies for ensuring the security of energy and it will help to handle the economic growth of the country. Keeping this relationship in consideration, following hypothesis is formulated:
H_3: There is a significant impact of energy depletion on the economic growth of ASEAN countries

3. Research Methodology

3.1 Data Collection

In this research study, we have chosen 10 ASEAN countries to measure the effect of natural resource depletion, mineral depletion, and energy depletion on the economic growth of these countries. The data has been collected over 25 years of research from 1993 to 2018. The countries selected for the research purpose are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. These countries are selected as the economic growth in these developing economies has been slowed down in the past years. The independent variables used for the study are natural resource depletion (NRD), energy depletion (ED), and mineral depletion (MD). The dependent variable to be measured is the economic growth (EG) of all the countries. The control variables are population growth (PG) and per capita income (PCI). Here energy depletion value is the ratio of reserve lifetime and the stock of its energy resources like natural gas, oils, etc., The mineral depletion refers to the ratio between reserves lifetime and the stock of mineral resources like gold, zinc, etc., The natural resource depletion covers the scarcity of non-renewable resources, forest depletion, etc., Whereas, the economic growth is measured as GDP of the respective country.

Hence the functional form is as follows:

$$EG_{it} = f(NRD_{it}, MD_{it}, ED_{it}, PG_{it}, PCI_{it}) \quad (1)$$

The above equation can be modeled as:

$$EG_{it} = \beta_1 NRD_{it} + \beta_2 MD_{it} + \beta_3 ED_{it} + \beta_4 PG_{it} + \beta_5 PCI_{it} + \varepsilon_{it} \quad (2)$$

where EG_{it} is the economic growth, β_1 to β_{5i} are the coefficients representing the relationship of explanatory variables with dependent variable and ε_{it} is the error term.

3.2 Cross-Sectional Dependence Test

To evaluate whether these depletions of natural resources, mineral, and energy resources affect the economic growth of the countries, we need to see whether these are cross-dependent on each other or not. For which, the null hypothesis states that the variables are independent and identically distributed. Pesaran (2004) has developed a model that we can use for cross-sectional-dependence (CD) analysis. The equation for CD is stated as follows:

$$CD = \sqrt{\frac{2T}{N(N-1)} \sum_{i=1}^{N-1} i \sum_{j=i+1}^{N} \rho} \quad (3)$$

And here ρ indicates the error term for the correlation between the variables. The hypotheses for this test are as follows:

H_0: Cov (u_{it}, u_{ij}) = 0, no cross-sectional dependence
H_1: Cov (u_{it}, u_{ij}) ≠ 0, no cross-sectional dependence

Further, the homogeneity slope is tested to see whether the variables measure the same thing or different effects. Hence, the null hypothesis for it is that there is slope homogeneity among the variables. Further, the delta and adjusted delta tests are conducted as proposed by Swamy (1970) to see for the heterogeneity among variables. The model equation for this is as follows:

$$\Delta = \left(\sqrt{N} N^{-1} S - \frac{K}{\sqrt{2k}}\right) \quad (4)$$

Where S is the symbol for the Swamy model. This Δ statistic can be adjusted for further normal distribution and the equation is described as follows:

$$\Delta_{adj} = \sqrt{N}\left(N^{-1}S - \frac{E(zit)}{\sqrt{var(z)}}\right) \quad (5)$$

3.3 CIPS Panel Unit Root Test

The CIPS panel unit root test is conducted to test the stationarity of the variables. The test equation is for CIPS panel unit root test is as follows:

$$CIPS = N - 1\sum_{i=1}^{N} i\, CADF_i \quad (6)$$

Here CADF measures the Augmented Dicky Fuller (Cheung & Lai, 1995). If the test statistic "t" value is larger than the critical value then we reject the null hypothesis and conclude that the variables are stationary.

3.4 LM Bootstrap Panel Cointegration Test

A panel cointegration test is used to test whether the variables have cointegration among each other within the group and outside the group mean (Westelund, 2007). If the bootstrap value comes out to be less than its significant value then we reject the null hypothesis and conclude that variables are not cointegrated. The equation used by Westerlund is as follows:

$$LM_N = \frac{1}{NT^2}\sum_{i=1}^{N} i \sum_{t=1}^{T} ws \quad (7)$$

Here, *s* shows the partial and *w* shows the long-term error variances. When the considered probability values turn out to be smaller as compared to its significance values, then we reject the null hypothesis.

3.5 Panel Causality Test

The final stage of the empirical analysis is the causality tests for the variables. We measured the causality tests from natural resources depletion, mineral depletion, and energy depletion to economic growth and then from economic growth to natural resources depletion, mineral depletion, and energy depletion. The equation system for Konya causality test is as follows:

$$EG_{1it} = \acute{\alpha}_{2,1} \sum_{n}^{i=1} \beta_{1i} NRD_{it} + \acute{o}_{2,1} \sum_{n}^{i=1} EG_{1,t-1} + \varepsilon_{it} \quad (8)$$

$$EG_{2it} = \acute{\alpha}_{2,1} \sum_{n}^{i=1} \beta_{1i} NRD_{2it} + \acute{o}_{2,1} \sum_{n}^{i=1} EG_{2,t-1} + \varepsilon_{it} \quad (9)$$

4. Empirical Results

Table 2 presents the cross-sectional dependence and homogeneity tests. The tests for $CD_{BP,}$ $CD_{LM,}$ and CD show that the null hypothesis is rejected, hence, we conclude that there is a cross-sectional dependency of variables, and delta results show that these are heterogeneous. Further, the delta and adjusted delta results are also significant to indicate the heterogeneity of the items.

Table 2
Cross-Section Dependence and Slope Homogeneity Tests Results

Variable	CD_{BP}	CD_{LM}	CD
NRD	138.32*	73.83*	34.93*
MD	122.87*	26.82*	10.38*
ED	127.17*	75.90*	14.28*
PG	132.18*	87.58*	16.39*
PCI	173.17*	65.93*	18.30*
EG	129.89*	40.49*	15.39*
Results of Homogeneity Slope			
Tests	LM Statistics	t-value	P-Value
Delta	22.47	2.48	.001
Adj Delta	26.38	3.18	.000

Table 3 shows results of unit root tests (CIPS) in which energy depletion (EG), population growth (PG), and economic growth are stationary at a level whereas, natural resources depletion (NRD), mineral depletion (MD) and per capita income (PCI) are stationary at first difference.

Table 3
CIPS Panel Unit Root Test Results

Variable	At Level	First Difference
NRD	-3.2762	-4.2873**
MD	-1.2737	-7.3767**
ED	-5.2721*	-13.2874***
PG	-8.2387*	-10.2831**
PCI	-1.8784	-9.3773***
EG	-3.3742*	-7.8371**

Table 4 shows the results of the bootstrap analysis which shows the existence of cointegration among variables of interest.

Table 4
LM Bootstrap Panel Cointegration Test Results

Conditions	LM statistics	Bootstrap p-value
Constant	-1.398	0.935
Constant + Trend	2.498	0.964

Table 5 explains the AMG estimation results for every country by measuring the coefficients while focusing on the heterogeneity and cross-dependence of the variables.

Table 5
AMG Estimation Results

Countries	NRD	MD	ED	PG	PCI
Brunei	0.223**	0.377**	0.168*	0.032	0.274**
Cambodia	0.l27*	0.288*	0.040	0.027	0.233**
Indonesia	0.036	0.372**	0.229**	0.136*	0.233*
Laos	1.381***	0.281**	0.198**	.0.214**	0.254*
Malaysia	0.471***	0.283**	0.294**	0.065	0.149*
Myanmar	0.213**	0.026	0.224***	0.243**	0.285**
Philippines	0.043	0.131*	0.341***	0.313*	0.253*
Singapore	0.387***	0.131**	0.122**	0.217**	0.254**
Thailand	0.321**	0.411***	0.015	0.203**	0.164*
Vietnam	0.659**	0.183*	0.037	0.229**	0.043
Penal	0.239**	0.212**	0.351***	0.311***	0.193**

Accordingly, natural resource depletion is damaging the economic growth of all the countries under study except Indonesia and the Philippines. Likewise, mineral depletion also damages the economic growth of all the selected countries except Myanmar. Also, energy depletion is detrimental to economic growth for all the selected counties except Cambodia, Thailand, and Vietnam.
Additionally, the Konya panel causality test is conducted to examine the direction of causality among all the variables under study. Table 6 briefly presents the results of the panel causality test.

It can be observed from Table 6 that there exists bidirectional causality among all the selected variables with the economic growth except energy depletion which means all the study variables are integrated such that a change in any of the study variables will harm the economic growth of the selected countries.

Table 6
Kónya Panel Causality Test Results

Alternative Hypothesis:	F-Statistic	Prob.
NRD causes EG	0.76630	0.4683
EG cause NRD	0.37410	0.6892
MD causes EG	2.09102	0.1307
EG causes MD	6.88280	0.0018
ED causes EG	4.50880	0.0142
EG causes ED	0.09406	0.9103
MD causes NRD	0.68184	0.5088
NRD causes MD	1.77580	0.1764
ED causes NRD	1.60960	0.2068
NRD causes ED	0.13619	0.8729
ED causes MD	0.26234	0.7700
MD causes ED	0.45156	0.6384

5. Discussion of Results

The primary objective of this research study is to analyze the importance of energy, minerals as well as natural resources to enhancing the economic growth of a country. It is well known that natural resources, minerals, and energy play an important role in enhancing the growth of the economy (Katz & Pietrobelli, 2018). It can be observed from the analysis that natural resources have a

significant positive role in enhancing economic growth which means a depletion in natural resources impedes economic growth. A recent previous study illustrates that resources are important for the development of any country (Abdulahi, Shu, & Khan, 2019).

For example, to generate energy, one needs fossil fuels; and for industrial development, mineral resources are required (Zallé, 2019). Likewise, the results also indicate that mineral resources also contribute to enhancing economic growth. The more a country has mineral resources, the more growth it will evidence (Aimer, 2018). In the past, some economist says natural resource curse is a solid fact but some refuse it (Lin, 2018). The abundance of natural resources such as coal, mining, minerals, gold, silver, crude oil, and others increase the GDP of an economy. Similarly, depletion of energy resources negatively affects the economic growth of a country.

6. Conclusion

This study concludes the determinants of economic development in ASEAN countries. Several factors hinder growth like labor, resources, destruction of land, and many more. The objective of the study to examine the detrimental factors which damage the economic growth in 10 selected ASEAN nations. For this purpose, this study covered the data of 25 years of Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. The dependent variable is economic growth and independent indicators are natural resources depletion, mineral depletion, and energy depletion with the supporting variables are population growth and per capita income. They used cross-section dependency tests, second-generation unit root CIPS unit root tests, and applied the Konya Granger causality tests. Results concluded that natural resource and mineral depletion significantly destroyed the economic growth of many countries.

7. Policy Recommendations and Future Research

The results have revealed that all-natural resources, minerals, and energy depletion significantly impact the economic growth of ASEAN countries. The findings illustrate that an abundance of natural resources heavily contributes to the economic growth of all the ASEAN countries. Therefore, the

respective governments increase their focus in conserving and enhancing their natural resources, minerals, and energy resources since it will help in attaining the macroeconomic targets.

Like all other studies, this research has some limitations that can be covered by future studies. Therefore, it is recommended that future research should focus on the effect of such natural resources on various other development indicators. Also, other novel techniques may be considered by future studies to investigate the subject matter.

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