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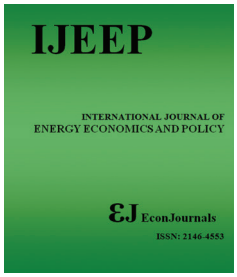

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Oil Prices, Control of Corruption, Governance, and Economic Growth Nexus in Saudi Arabia

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ABSTRACT

This study examines the impact of control of corruption and the effectiveness of governance on the economic growth in Saudi Arabia using the latest cointegration approach of Pesaran et al. (2001) and Kripfganz and Schneider (2019). We utilize unit root and cointegration tests using a maximum available sample from 1996 to 2019. The effect of control of corruption is found insignificant on economic growth, and a positive effect of governance is found in the long-run. The study is corroborated that good governance is an appropriate tool for economic growth in the long-run. Moreover, oil prices show a positive effect on economic growth both in the long and short run. It corroborates that the economic growth of Saudi Arabia is oil price dependent. The short-run effects of governance and control of corruption are found insignificant. Hence, a long period with good governance is required to support the economic growth of the Kingdom. So, it is recommended that the quality of governance should be enhanced to support economic growth.

Keywords: Control of Corruption, Governance, Economic Growth, Oil Prices
JEL Classifications: P16, O43, O13

1. INTRODUCTION

When an economy is being observed, the main factors that determine economic development are the macroeconomic indicators, which also reflect the people's living standards in the country. Every economy faces issues regarding development, and the economies in their development process face many obstacles. The phenomenon of corruption and growth goes neck to neck in an economy, and either corruption causes income growth or vice versa. The corruption takes place either politically or in cases where people tend to exploit other people. One way or another way, corruption is an issue that an economy needs to be dealt with because it can bring down growth and development. Economists and political scientists have lately examined the existing relationships among corruption, governance, and economic development. There has been very high growth in Saudi Arabia during the 2000s, but the growth declined in the recent decade. High growth generally is a prerequisite for all the macroeconomic indicators in any economy. However, corruption may lead to exploitation the resources, instability, social tensions, and injustice.

Corruption can be defined as the act of making somebody or something morally deprived of resources. The misuse of the public as well as government resources and power also comes under corruption. Corruption tends to widen the existing possibilities for income inequality and poverty, which may also hinder economic growth and development. Growth can be hindered in a way when rich people have a greater chance and motivation to carry out corruption. However, the poor are most prone to extortion, which would result in higher income inequality, thus resulting in a considerable poverty gap. It is a general concept that stable economies with good governments abstain from corruption because people are motivated to believe in honesty. The unstable economies with a low level of governance are most likely facing poverty and more corruption because all people think about generating income by any means, right or wrong. Corruption

contributes to poverty and income inequality, which is why many societies often fall prey to the enormous vicious circles of poverty and corruption.

Ades and Di Tella (1999) corroborated a negative relationship between growth and corruption. Torrez (2002) included political variables included democracy in the country, the government's size, and the power of decentralization in the model. Even though the presence of democracy is theoretically strong enough to nullify corruption. There have been many ongoing debates about the extent to which the factors, human capital accumulation, and the good institutions contribute to economic development. Literature is concluded that corruption is a result of a low level of governance in a country. It is concluded that a correlation is existing between poor institutions and economic performance. It is also said that either institution-led or education-led development can generate a stable economy with high income, which provides higher education and better institutional quality.

The fundamental reasons for the unequal distribution and corruption are the significant obstacles like an educational achievement, development, and institutions' quality. The existence of corruption is also because of the high levels of taxation. Large numbers of cases of corruption have been reported in this regard to international trade. When it comes to economic changes, the term nationalization has been closely related to corruption because public or state enterprises are the ones who carry on political corruption because they finance some activities like providing jobs to clienteles. The patterns of corruption have changed over the last many years, and it is unavoidable if its roots are deep in an economy. It has been evidence of many countries like France, Indonesia, etc., which take political advantages to gain favorable ruling conditions.

The literature has found that the spread of education and an increase in per capita income can also be called economic development and can reduce corruption. Moreover, their explanations mostly linger around when it comes to the cultural and historical variables (Treisman, 2000). Inequality is an essential factor igniting corruption, and corruption may decrease the level of investment and growth. In general, corruption is not that easy to define, as it is easy to be said and observed. Controlling corruption is one of the most challenging tasks because people do not think about their morals or ethics. They tend to do it to earn income. The economic growth of an economy is its long-term productive capacity. By productive capacity, it is meant that the output produced can be taken to the next level if all the resources are efficiently used.

Corruption tends to have its roots deep in an economy and tends to break down. With corruption, an economy may become sluggish, and there had been high fluctuations in the growth rate. In any economy, institutional weaknesses can give way to corruption, and increasing corruption may contribute to the sluggish growth rate. The other reasons for the presence of corruption are low salaries of the public sector compared to private sectors, the political influences imposed by the politicians, and the administrative institutes' non-serious behavior, which results in poor governance. Corruption is one of the worst problems an economy can face when it is growing. The present study mainly focuses on controlling corruption, governance effectiveness, oil prices, and economic growth relationship in Saudi Arabia.

The following study contains the second section consisting of a literature review covering many different articles of different authors for critical analysis. After the literature review, the third section has a methodology that has covered the variables' description. The fourth section includes the econometric estimation of the techniques used to test variables and their linkages with each other. The fifth section covers conclusions and recommendations.

2. LITERATURE REVIEW

The oil prices could affect the economy in terms of income and exchange rate variation (Tancho and Jermsittiparsert, 2020). ON the other hand, many scholars have chosen corruption to be discussed from an economic perspective. The governments want to reduce corruption, whether developed, developing, market-oriented, or trade-oriented. The word corruption has been discussed for a long time, and the amount of attention paid to corruption nowadays is unbeatable because it is one of the giant evils that an economy can face. La Porta et al. (1999), Treisman (2000), Kaufmann and Kraay (2002), and Dutt (2009) suggest that corruption is an attractive phenomenon and has gotten much attention recently as compared to the past. Centrally planned economies such as Russia or Tanzania are known for their corrupt practices. In some economies, it is reported that after political changes took place, corruption cases increased. Corruption is a threat to destroy an economy and international business in recent years. There are large pieces of evidence of the incidences of corruption in different countries across the world.

Tanzi (1998) examined and found that the beginning of corruption from the emergence of a weak government itself and the expansion of trade is also responsible. The word corruption can be classified into different categories. Tanzi (1998) used the Gallop polls for 44 countries famous for corruption and used a period from 1995-1998 by using the Corruption Perceptions Index. It is concluded that corruption affected the countries in many different cases because when corruption is done on a high level, it is the factor that contaminates the decisions. Li et al. (2000) considered a nexus between corruption and economic growth. In general, corruption is a continuous headache for the policymakers and international organizations who work against it. The data was taken from the years 1982 to 1994 for 41 countries. The framework's chosen variables were corruption, risk of expropriation, the rule of law, government repudiation of the contract, and bureaucratic quality, and the Gini coefficient for income inequality. Corruption worsens and hinders growth, and corruption is why large income gaps are large in developing and industrial countries. The countries with less equal distribution of assets would have a high association with corruption, and a minute increase in income inequality would result in a higher decrease in growth rates.

Sanyal and Samanta (2002) studied the cultural and economic factors of corruption across different countries. The authors' main objective was to ascertain the main cultural and economic factors

that trigger corruption and the reason for the variation in corruption in different economies. To conduct the study, the Corruption Perception Index was used, and initially, 85 countries were found to be corrupted, and then panel data was taken for three years. At the same time, the countries with low capita income were highly involved in corruption. It was also concluded that both cultural and economic factors were highly triggered by corruption in a country. Anwar (2007) examined sectorial inequality and its relationship with growth and found a negative relationship between sectorial inequality and economic growth.

Robertson and Watson (2004) examined the different levels of corruption and its influences from a strategic perspective, which were presented and focused on relevance to the changes. The index used for corruption was the Corruption Perceptions Index (CPI), and the CPI score for 99 countries was available for the year 1999, and the CPI score of 80 countries was available for 2000. The independent variables were categorized in two ways, i.e., change in FDI variables and cultural variables, which were masculinity and uncertainty avoidance. These were selected for being consistent with FDI and Corruption. Results indicated that rapid changes in the rate of corruption were linked with the dimensions of the cultural variables, masculinity, and uncertainty avoidance. You and Khagram (2005) found that income inequality increased corruption through a different mechanism. The authors have also worked on the existing relationships between inequality and democracy. There was a cross-national variation in corruption. Their theoretical background delivered the reasons for income inequality to increase corruption. Then, the empirical part concluded a negative relationship between inequality and democracy.

Drury et al. (2006) worked on the critical factors determining economic growth from 1982-97. These factors were political processes using an index of corruption like democracy and corruption. The studies found and suggested that democracy could contribute to economic growth. DiRienzo et al. (2007) inspected the effects of technology on different levels of corruption. The control variable used by the authors was masculine-feminine cultural values. Corruption Perceptions Index was used to measure corruption and the Digital Access Index for technology. One hundred seventy-eight countries were taken into account, and the authors did the regression analysis technique and cluster analysis of 86 countries. The results indicated that with the increase in the information levels, the corruption level is reduced. Dutt (2009) has taken into account the trade policies and their effects on increased bureaucratic corruption. The countries that the authors take are the ones that have high protectionist trade policies. The results show that trade liberalization led to improve governance.

Hodge et al. (2009) explored the channels between the present corruption and growth, through which the growth was indirectly affected by corruption. Overall, corruption is a widespread phenomenon that has adverse effects on the macroeconomic level by affecting the foreign direct investment through which economic growth is hindered. The technique used by the authors is 3 stage least square in 81 countries from 1984 to 2005. The degree of corruption indexes was used to measure the level of corruption. They found a negative relationship between corruption and growth. Ugur (2011) estimated the direct effects of corruption on growth. The most prominent symptom of corruption was a low institutional quality that adversely affected the nations' economic growth. So, a negative relationship between corruption and growth was corroborated. Dridi (2013) observed the transmission channels through which corruption affected or hindered the growth and claimed that there had been no proper theory to examine the mechanisms through which corruption could reduce growth. The identification of the existing transmission channels was made by using the Channel methodology. The simultaneous equations' results indicated the negative effect of corruption on various determinants of growth.

Ajie and Wokekoro (2012) studied the impact of corruption on the growth sustainability of Nigeria. They checked the overall impact of corruption on the working of an economy and its consequences on national development. According to the authors, corruption occurs when at least two parties are involved in businesses for self-interest and use unfaithful means of generating money. The authors concluded and recommended that the current ruling government take initiatives to develop the rules and regulations to prosecute anyone responsible for illegal activity. The government should also work on accountability, transparency, fiscal responsibility of the inhabitants, and the lost social value system can be restored in this way. Blackburn (2012) argued that corruption and development have a negative two-way causal relationship. He estimated the ratings of corruption in different countries by using the data of 1980-1999 and 2001-2004, which corroborated a higher level of corruption in developing countries than the rich. They explained that corruption leads to inefficiency in an economy that means per capita income is negatively correlated with corruption.

Matthew and Idowu (2013) analyzed the emergence of democracy in which the people demanded better living standards against colonialism, military, and civilian rules in Nigeria located in Sub-Saharan Africa. The deep and robust democratic governance was found essential for developing countries, and development led to capital accumulation and economic growth and showed a positive impact on the sustainability of the economy. The presence of civilian regimes resulted in massive corruption, the absence of political openness, unemployment, and poverty. Their analyses used transparency, openness, accountability, unemployment, poor infrastructure, and political corruption variables. Corruption encouraged economic crumble that made it unable to promote the rule of law and order. Moreover, they concluded that equity among society and the fruits of growth should be widely shared. The impact of corruption on all societies was hostile, especially for developing countries, because of inefficiency in the economies. The authors suggested that political structures are to be created and justified to reduce political corruption.

Bai et al. (2013) empirically tested whether growth leads to lower corruption considering heterogeneity in the growth rates in Vietnam. It is a common opinion of many economists and socialists that government corruption is more prominent in developing countries than in rich countries. The authors used firm-level data sets from the General Statistics Office of Vietnam. The period for the cross-sectional firm-level data was from 2006

to 2010. The model that the authors developed was started with the choice of government officials of how much bribe money is to be extracted from the firms based on inter-regional taxes. Thus, it was concluded that economic growth decreased the rate of bribe extraction. Adenike (2013) studied the corruption and growth nexus in Nigeria from 1980 to 2009. Nigeria occupied a considerable amount of natural resources and oil. However, the economic growth is still prolonged because of the presence of corruption, and it is full of crimes like collecting illegal tolls, child labor, illegal drug trafficking, piracy, thefts, human trafficking, etc. Corruption is mainly responsible for the low economic growth and mass poverty in the prominent regions of Nigeria. The low quality of infrastructure and services were still in the grasp of corruption. In the Saudi economy, Alkhathlan et al. (2020) corroborated that oil diversification might enhance economic growth because oil price fluctuations might affect the economy at large. Alkhateeb et al. (2020c) corroborated the positive role of education in the economic growth of Saudi Arabia. Zamil et al. (2019) corroborated the linkages of trade and environment in the oil-abundant country. A few studies also investigated energy, trade, and financial markets relationships (Alkhateeb and Mahmood, 2019; Mahmmod et al., 2019; Senan et al., 2018).

A gulf of literature has investigated the oil prices and macroeconomics nexus in Saudi Arabia (Alkhateeb and Mahmood, 2020a; Alkhateeb and Mahmood, 2020b; Alkhateeb et al., 2017a; Alkhateeb et al., 2017b; Mahmood and Alkhateeb, 2018; Mahmood et al., 2020; Mahmood and Furqan, 2020; Mahmood and Zamil, 2019; Mahmood and Murshed, 2020, Mahmood, 2021; Alkhateeb et al. 2021). On the other hand, the literature has signified the relationships among corruption, governance, and economic growth. Hence, it is pertinent to test these relationships in a resource-rich country Saudi Arabia that is missing in Saudi literature. The present study is going the test the relationship using the period 1996-2019 in Saudi Arabia.

3. METHODOLOGY

There can be many determinants of economic growth. Nevertheless, we aim to find the effects of governance effectiveness, control of corruption, and oil price on economic growth. These factors may play a prominent role in the growth process of Saudi Arabia. Therefore, a growth model is hypothesized in the following way:

$$GDPC_t = f\left(COC_t, GOV_t, OP_t\right) \quad (1)$$

$GDPC_t$ is the natural log of GDP per capita, and increasing $GDPC_t$ shows economic growth. COC_t is control of corruption index ranging from −2.5 to +2.5, and increasing index shows a better control over corruption. GOV_t is a governance effectiveness index ranging from −2.5 to +2.5, and an increasing index shows better governance. OP_t is the natural log of oil prices. All data is sourced from World Bank (2020) and Freedom House (2019). A positive relationship between good governance and growth is expected. The government's better performance could establish better economic, political, trade, and social policies that could enhance economic activities and economic growth. The control of corruption and growth may have a positive or negative relationship. A positive relationship is hypothesized as control of corruption may increase local and foreign investors' confidence, and increasing investment can support the growth activities. Contrariwise, a negative relationship may also be expected as controlling corruption could increase production cost and maybe results in challenging conditions for business ventures' opening and running. However, the estimated results could corroborate the right direction of the relationship between control of corruption and growth, and it is an empirical research question.

For the empirical testing of equation 1, we need to check the unit root in all hypothesized series. We use the Augmented Dickey and Fuller (ADF) (1981) test for this purpose. ADF equations are as follows:

$$\Delta y_t = \gamma_0 + \gamma_1 y_{t-1} + \gamma_2 t + \sum_{i=1}^{r} \gamma_{3i} \Delta y_{t-i} + \epsilon_t \quad (2)$$

$$\Delta y_t = \gamma_0 + \gamma_1 y_{t-1} + \sum_{i=1}^{r} \gamma_{3i} \Delta y_{t-i} + \epsilon_t \quad (3)$$

$$\Delta y_t = \gamma_1 y_{t-1} + \sum_{i=1}^{r} \gamma_{3i} \Delta y_{t-i} + \epsilon_t \quad (4)$$

The coefficient may decide a series be stationary or not. For example, a negative coefficient would indicate the stationary series y_t. Otherwise, a series can be claimed as non-stationery. Afterward, we choose Autoregressive Distributive Lag (ARDL) for regression analysis, which provides efficient results in a mixed integration order. ARDL of equation 1 is as:

$$\begin{aligned}\Delta GDPC_t &= a_0 + a_1 GDPC_{t-1} + a_2 COC_{t-1} + a_3 GOV_{t-1} \\ &+ a_4 OP_{t-1} + \sum_{j=1}^{p} a_{5j} \Delta GDPC_{t-j} + \sum_{j=0}^{q} a_{6j} \Delta COC_{t-j} \\ &+ \sum_{j=0}^{q} \Delta GOV_{t-j} + \sum_{j=0}^{q} a_{8j} \Delta OP_{t-j} + e_{1t}\end{aligned} \quad (5)$$

Equation 5 would be tested with H_0 of no-cointegration, and long-run effects would be calculated by adopting the normalizing procedure. To ensure the Bound test's efficiency, we utilize efficient F-values from Kripfganz and Schneider (2019). Afterward, we may incorporate the error correction term (ECT_{t-1}) in equation 5, replacing lagged-level variables to have short-run effects in the following way:

$$\begin{aligned}\Delta GDPC_t &= \beta_0 + \beta_1 ECT_{t-1} + \sum_{j=1}^{p} \beta_{3j} \Delta GDPC_{t-j} \\ &+ \sum_{j=0}^{q} \beta_{4j} \Delta COC_{t-j} + \sum_{j=0}^{q} \beta_{5j} \Delta GOV_{t-j} \\ &+ \sum_{j=0}^{q} \beta_{6j} \Delta OP_{t-j} + e_{2t}\end{aligned} \quad (6)$$

If *β1* is found negative, then a short-run relationship can be claimed. Moreover, short-run effects can be elaborated from estimated parameters. To ensure the validity of equations 5 and 6, the diagnostic test can be applied to ensure estimates' reliability.

4. DATA ANALYSES

Before time series analysis, we analyze the ADF unit root test, and the results are presented in Table 1. $GDPC_t$ and OP_t are

non-stationary at their level. At level, some shreds of evidence of stationarity are found for COC_t and GOV_t. However, all variables are stationary at first difference. Hence, we corroborate a mixed order of integration. However, we may proceed with regression analysis as ARDL produces efficient estimates even in a mixed order.

After the unit root analysis, we test the ARDL bound test on the selected model. F-value from the bound test shows a low value, which is even lower than the 2.62 lower bound value of Kripfganz and Schneider (2019). Hence, cointegration is not corroborated with the bound test, but it is corroborated with a negative coefficient of ECT_{t-1} (Pesaran et al., 2001). The diagnostic tests are conducted, and results are presented at the bottom of Table 2. All P-values are more than 0.1, so these tests corroborate the efficient and reliable estimates from the selected ARDL model.

In the long-run, governance has a positive effect on economic growth. Hence, the governance effectiveness supports the countries' economic and trading activities, so it helps to increase the economic growth of Saudi Arabia. The quality of governance is also indicating the fair and supporting economic, legal, and trading policies that could help the nations to grow. Further, good governance attracts local and foreign investments in the country, which may accelerate economic growth. On the other hand, control of corruption has an insignificant effect on economic growth. The control of corruption may reduce economic activities as controlling corruption may increase production costs and increase economic activities' toughness. Nevertheless, an insignificant result corroborates that corruption control could not reduce the income per capita and economic growth in Saudi Arabia. The oil price has a positive effect on economic growth. This positive relationship corroborates that increasing oil price helps grow an oil-exporting economy, and decreasing oil price hinders the growth process.

The short-run relationship is corroborated in the model with a negative coefficient of ECT_{t-1}. Governance and control of corruption have insignificant effects on economic growth. This result corroborates the fact that governance and control of corruption need a long time to support the growth process of any country effectively. Oil prices are again helping to the growth process of the oil-exporting economy of Saudi Arabia like the long run results.

Table 1: ADF unit root test results

Variable	Intercept	Intercept and trend	None
$GDPC_t$	−1.0337	−2.7725	0.5824
COC_t	−1.5659	−3.9241**	−1.6380*
GOV_t	−0.8166	−3.4697*	−1.1193
OP_t	−1.2816	−1.4523	0.6614
$\Delta GDPC_t$	−3.7197**	−3.6817**	−4.7107***
ΔCOC_t	−5.3245***	−5.4380***	−5.3168***
ΔGOV_t	−5.2542***	−5.0856***	−4.7695***
ΔOP_t	−3.8224***	−3.7959**	−3.7623***

***, ** and * shows stationarity at 1%, 5% and 10%, respectively

Table 2: ARDL results

Variable	Coefficient	Std. Error	t-statistic	Prob.
Long Run				
GOV_t	0.2521	0.1136	2.2186	0.0404
COC_t	−0.2123	0.1324	−1.6034	0.1273
OP_t	0.0744	0.0352	2.1140	0.0496
Intercept	9.6039	0.1379	69.6274	0.0000
Short Run				
ΔGOV_t	0.1186	0.0862	1.3748	0.1870
ΔCOC_t	−0.0998	0.0577	−1.7308	0.1016
ΔOP_t	0.0350	0.0126	2.7853	0.0127
ECT_{t-1}	−0.4702	0.2297	−2.0471	0.0564
Diagnostic Tests				
Bound Test	F-value=1.7812			
Heteroscedasticity	F-value=0.6573			0.6299
Serial Correlation	F-value=0.1213			0.8866
Functional Form	F-value=0.1985			0.6619
Normality	Chi-square=1.4283			0.4896

5. CONCLUSIONS

One of the main reasons responsible for a country's underdevelopment is the evil of corruption. Therefore, it is very pertinent to control it even at the cost of some reduction in economic activities. Moreover, governance effectiveness could play a prominent role in the control of corruption and supporting economic growth. This research has investigated the effects of control of corruption and governance on the economic growth of Saudi Arabia using the period 1996 to 2019. The ARDL approach is implemented to estimate the hypothesized relationships. The effect of control of corruption is found insignificant on economic growth in all estimates. However, the positive effect of governance is found in the long-run. Hence, the study is corroborated that good governance is a necessary component of long-run growth. Further, a long period of good governance is required to support the economic growth of the Kingdom, as the short-run effect of governance is found insignificant. It is a general concept that stable economies with good governance and high educational level abstain from corruption because people are motivated to believe in honesty to maintain the political spectrum. Moreover, the effect of oil prices is found positive both in the long and short run. It corroborates that Saudi Arabia's economic growth is oil price dependent in both the short and long run. Based on this study's findings, governance in the Kingdom is affecting the growth of the economy. Therefore, it is recommended that the ruling government be strong enough to develop the political process to eradicate corruption and prosecute any person involved in bribery, extortion, embezzlement, or any false activity irrespective of the religious party and tribe cast. There is a strong need to get hold of good governance as well. The government official's responsibilities should possess and exhibit honesty, sincerity, devotion, accountability, fiscal responsibility, transparency, and respect for the rules and regulations of law.

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