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Oil Resource Abundance in the Gulf Cooperation Council Countries: A Curse or a Blessing?

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ABSTRACT

The purpose of this research is to investigate whether oil abundance in the Gulf Cooperation Council (GCC) countries promotes or hinders their economic growth. Therefore, several variables were utilized to include: the gross domestic product (GDP), oil production, gross fixed capital formation, total population, electricity consumption, and inflation. The study covers 37 consecutive years from 1981 to 2017, and employs the autoregressive distributed lag (ARDL) model to estimate the oil-growth long-run relationship. The findings reveal that oil abundance in the GCC countries had both short-run and long-run growth-enhancing effect. In addition, the variables of total population, electricity consumption and gross fixed capital formation found to have significant positive coefficients in the long-run, suggesting that oil sector has given the opportunity to other factors of production to contribute to economic growth. Similarly, the results show a positive relationship between inflation and economic growth suggesting that higher rate of inflation is associated with faster economic growth. The study concludes that oil abundance on its own does not behave as a curse in the GCC countries.

INTRODUCTION

A lively debate in development studies questions why some resource-deficient developing countries (like Hong Kong and Singapore) have managed to achieve high economic growth rates, while other resource-abundant countries (like Algeria, Venezuela, and Sierra Leone) have achieved comparatively slower growth. The debate in the literature goes deeper, attempting to explain why this inequality in the growth rates has increased significantly since the 1970s (Auty, 2001). As yet, no consensus has emerged.

One might expect that countries with substantial reserve of oil, minerals, and other natural resources should grow faster than other resource-poor countries, ceteris paribus. Looking at the literature, studies backing this hypothesis emerged in the late nineteenth century when several resource-rich nations, like Australia, Britain, Canada, and the United States of America realized rapid development, especially in their industrial sectors.

Yet, numerous empirical studies challenge this argument. In reality, many resource-rich countries seem to perform worse in respect of their economic development and growth in real per capita income. For the last few decades, countries with abundant oil have recorded a contraction in their economic growth. Even OPEC as a whole recorded negative growth rates (Van Der Ploeg, 2011). Gylfason (2001) investigated the performance of 65 resource-rich countries over the period 1970–1998. Only Botswana, Indonesia, Malaysia, and Thailand achieved over 25% in their average long-run rate of investment to GDP and over 4% per year as an average per capita GNP growth. Such economic failure is mainly pronounced among some of the Gulf countries. Though these countries have prospered with their reserves of oil and gas, they remain highly vulnerable to price shocks.

The adverse economic behaviour of resource-rich countries prompted the question: Does resource abundance benefit or harm economic growth? The term 'resource curse' describes the negative relation between the magnitude of natural resource's reserve and economic growth. In theory, resource abundance can, and often does, provoke internal conflicts as different groups fight to control the natural resources. This struggle, in turn, can lead to impaired development, economic instability, widespread corruption, and ineffective governance (Stevens et al., 2015).

The 'resource curse' was investigated by a large number of studies. Initially, the vast body of literature focused on the relationship between primary products and natural resources. The empirical evidence developed by Sachs and Warner (1995) showed that countries rich in natural resources tended to perform badly. Their findings were supported by many other studies including Auty (2001), and Mehlum et al., (2006). The adverse economic impact of natural resource abundance was highlighted following the first oil price crisis. The literature speculated that the large revenues from oil could have negative implications for the development prospects of countries (Isham et al., 2005; Boschini et al., 2007).

This paper is organized as follows: Section 1 displays the literature review related to the 'resource curse'. On the other hand, section 2 provides an outline of the empirical model. Section 3 discusses and analyses the findings. Finally, the concluding remarks with policy recommendations are provided in the last section of the study.

1. LITERATURE REVIEW

Literature testing the impact of resource abundance on economic growth is extensive. However, most studies provided conflicting results. For Instance, Wheeler (1984), Sachs and Warner (1995), Gylfason (2001), Selim and Zaki (2014), and Satti et al., (2014) found that resource abundance is negatively correlated with economic growth. In contrast to Amini (2018), Khezri and Hoda (2018), and Cavalcanti et al., (2011) where resource abundance found to be positively correlated to economic growth. Others such as Polterovich et al., (2010) concluded no evidence between resource abundance and economic growth on a large tested sample of countries. The summery of 'resource curse' literature is provided in Table 1.

Table 1. Summary of ‘resource curse’ literature

Authors	*Region/ Countries*	*Period*	*Method*	*Main Findings*
Wheeler (1984)	Sub-Saharan Africa	1970-1980	OLS	Resource abundance is negatively correlated with growth.
Sachs and Warner (1995)	95 developing countries	1970-1989	OLS	
Gylfason (2001)	65 resources-rich countries	1965-1998	SUR	
Selim and Zaki, (2014)	22 countries of the Arab Region	1960-2012	OLS, fixed effects	
Satti et al., (2014)	Venezuela	1971-2011	VECM	
Cavalcanti et al., (2011)	53 oil-exporting countries	1980-2006	MG, CCEMG, CCEP	Resource abundance is positively correlated to economic growth.
Amini (2018)	22 developed and 61 LDC’s and DC	1996-2010	FE & RE	
Khezri and Hoda (2018)	Algeria, Iran Kuwait, Nigeria, Qatar, KSA, UAE and Venezuela	2002-2016	FE & RE	
Chekouri et al., (2017)	Algeria	1979–2013	VAR with exogenous variables	Oil revenue positively correlated to economic growth. Oil volatility of revenues is negatively correlated to growth.
Maalel and Mahmood (2018)	GCC countries	1980-2016	Non-linear ARDL	Oil to GDP ratio has positive impact on growth of most GCC. Oil exports dependency has negative effects in Kuwait, KSA and UAE).
Polterovich et al., (2010)	100 countries	1975-1999	Regressions	No evidence.

2. DATA AND METHODOLOGY

2.1 Data

Dataset includes annual data for all GCC countries. The study covers 37 consecutive years from 1981 to 2017. To account for the economic growth, this analysis uses gross domestic product (GDP) reported in constant 2010 US dollar to adjust for inflation. As for measuring oil abundance, there is no agreement about the best index to use so far. However, oil production seems to be a more acceptable indicator than oil reserves, oil export or oil dependence, Cavalcanti et al., (2011). Therefore, oil production measured in million-barrel per year, is used to present oil’s impact on the GCC economies. This variable is used as a factor of production in the production function to count for the effect of oil on the aggregate economic activity. We acknowledge that using this proxy necessitates the assumption that an optimal constant extraction rate over the period under consideration is in place, Torres et al., (2012).

To mitigate for the omitted variable bias, this study incorporates other drivers of economic growth, namely: Gross fixed capital formation (GFCF) in constant US dollar as a proxy for capital, total population represented by the labour force (POP), electricity consumption KWH per capita (ELC), and inflation (INF). Including electricity consumption and inflation in the equation will add to the literature by testing their relationship to the economic growth in the GCC states.

Electricity consumption data is extracted from Organization of Arab Petroleum Exporting Countries (OAPEC) database, whereas all other variables are recorded by the United Nations Conference on Trade and Development (UNCTAD) database.

2.2 The Empirical Model

This study assumes that the long-term impact of oil on economic development would be more homogeneous across the GCC countries. This is mainly because all six states have similar economic growth practices; dominant role of the hydrocarbon sectors, especially oil, in their development; and because common technologies influence all these countries in a similar way. However, we assume that, the short-run impacts of oil on economic activities are influenced by variables that may vary between the six states. Therefore, it seems logical to claim that the countries' heterogeneity is particularly pertinent in the short-run. As the long-run coefficients seem to be identical but the short-run coefficients differ across the GCC countries, the Pooled Mean Group (PMG) estimator is used to provide more efficient estimation (Pesaran et al., 1999).

To estimate the oil–growth long-run relationship, we apply a panel autoregressive distributed lag (ARDL) model based on the PMG estimator. The ARDL dynamic heterogeneous panel regression adapt an ARDL (p, q,q,q.....,q) approach, where *p* refers to the lags of dependent variable and *q* is the lags of regressors as:

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q} \varphi'_{ij} x_{i,t-j} + \mu_i + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

for *t=1, ..., T* ; *i=1, ..., N*

In which, *T* represents the time series dimension, *N* accounts for the number of countries, y_{it} is a scalar dependent variable, x_{it} is the k × 1 vector of explanatory variables for group *i*, λ_{ij}'s are scalar coefficients of the lagged explanatory variables, φ'_{ij} 's k x 1 coefficient vectors, μ_i denotes the fixed effects and ε_{it} is the error term.

The re-parameterised version of model (1) can be constructed as suggested by Pesaran et al., (1999) as follows:

$$\Delta y_{it} = \phi_i y_{i,t-1} + \beta'_i x_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \varphi'_{ij} \Delta x_{i,t-j} + \mu_i + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

ε_{it}, is independently distributed with mean equal to zero and variance differs across countries. ϕ_i is assumed to be less than zero for all countries. Consequently, the long-run relationship between the variables is explored via:

$$y_{it} = \xi^i x_{it} + \psi_{it} \; i = 1,2, \ldots\ldots, N; \; t = 1,2, \ldots., T$$

Where $\xi_i = -\frac{\beta'_i}{\phi_i}$, is the *k x 1* vector of long-run coefficient and ψ_{it} *'s* are stationary with possibly non zero means (including μ_{it}). Hence, equation (2) would be presented as:

$$\Delta y_{it} = \vartheta_i \psi_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \varphi'_{ij} \Delta x_{i,t-j} + \mu_i + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$\psi_{i,t-1}$ measures the speed at which the model returns to equilibrium after a shock. To confirm the presence of a long-run relationship in the model, the coefficient of the Error Correction Term (ECT) ϑ_i is expected to be less than 1, negative and statistically significant.

3. RESULTS AND DISCUSSION

3.1 Cross Section Dependence

It has become common in the econometric literature that obtaining reliable results requires making sure that there is no potential cross-sectional dependence, whereby all units in the same cross-section are not correlated, which is something highly unlikely to hold in practice. In case of the existence of cross-sectional dependence using the first generation of stationarity tests, become useless since it tends to reject the null hypothesis of a unit root excessively. Therefore, we resort to the second-generation tests, which it has the capacity to deal with this problem.

For testing cross-sectional dependency in panel data there are different tests offered by econometrics. We first detect for cross-sectional dependency among variables, and second cross sectional independence in the panel. For the former, four tests which are developed by Breusch and Pagan (1980) CDLM1, (Pesaran, 2004) CDLM2, Pesaran (2004) CDLM and Pesaran et al., (2008) are applied. Testing for cross section dependence in the panel accomplished with the aid of Pesaran (2004) CD test.

Based on the results of Table 2, the null hypothesis of "no cross-sectional dependence" is rejected even at 1% level of significance, indicating that there was cross sectional dependence between the six countries constituting our panel. This could be due to particular issues concerning the GCC members. Examples are political regimes, economic common macroeconomic shocks such as oil prices, technological evolution, openness, resource endowments, and tradition of the GCC members tend to move similar to each other; therefore, cross-sectional dependence is being there.

Table 2. Cross-sectional dependence test results

Variable	*Breusch-Pagan LM*	*Pesaran scaled LM*	*Bias-corrected scaled LM*	*Pesaran CD*
LnGDP	491.07(0.000)***	86.918(0.000)***	86.835(0.000)***	22.149(0.000)***
LnGFCF	508.55 (0.00) ***	90.109(0.000)***	90.026(0.000)***	22.549(0.000)***
LnOilProd	269.06(0.000)***	46.385(0.000)***	46.301(0.000)***	16.042(0.000)***
LnELC	306.17(0.000)***	53.161(0.000)***	53.078(0.000)***	17.032(0.000)***
LnPOP	494.47(0.000)***	87.540(0.000)***	87.456(0.000)***	22.215(0.000)***
LnINF	534.47(0.000)***	94.842(0.000)***	94.759(0.000)***	23.118(0.000) ***

Note: *** indicate significant at 1% level.

3.2 Second Generation Panel Test

Based on the results that the cross sections included in the panel used in this study are not independent, two-unit root tests of the second generation, which are able to deal well with the cross section dependence and yield more reliable and precise results, are used in this study. The first test is the CIPS developed by Pesaran (2007), and the second test is the Pesaran's cross-sectionally augmented Dickey-Fuller (CADF) test. The empirical results of both tests are presented in Table 3. The most important conclusion that can be drown from these results is none of the variables are stationary at I(2).

Table 3. Pesaran CADF and CIPS panel unit root tests

PES-CADF					
Variable	*Constant*	*Constant & Trend*	*Variable*	*Constant*	*Constant & Trend*
LnGDP	-3.088***	-2.799	ΔGDP	-3.841***	-3.823***
LnGFCF	-3.644***	-3.855***	ΔGFCF	-5.088***	-5.058***
LnOilProd	-3.22***	-3.307***	ΔOilProd	-3.944***	-3.876***
LnELC	-2.001	-2.124	ΔElec	-3.723***	-3.781***
LnPoP	-2.017	-1.392	ΔPop	-3.220***	-3.370***
LnINF	-2.095	-3.19**	ΔDef	-4.838***	-4.895***
CIPS					
LnGDP	-3.426***	-2.848	ΔGDP	-4.983***	-4.980***
LnGFCF	-3.880***	-4.050***	ΔGFCF	-5.697***	-5.796***
LnOilProd	-2.7270*	-2.656	ΔOilProd	-4.637***	-4.745***
LnELC	-2.2590*	-2.335	ΔElec	-5.307***	-5.461***
LnPOP	-1.419	0.955	ΔPop	4.850***	-5.001***
LnINF	-2.562***	-3.305***	ΔDef	-6.046***	-6.171***

Notes: critical values, with constant: 10% (−2.21), 5% (−2.33), 1% (−2.55), with constant & trend: 10% (−2.73), 5% (−2.84), 1% (−3.06); tests executed with the xtcips and pescadf commands in stata. ***, **, and * indicate the level of significance at 1%, 5%, and 10%, respectively.

3.3 Panel Cointegration Tests

When the stationarity tests show that all variables are I(1), I(0) or mixed, one can perform cointegration tests to ascertain a long-run relationship in the model. Bootstrap resampling procedures are applied at 100 re-estimations for each Westerlund panel cointegration test and provide us with robust-p-values. Bandwidth is set using (4*(T/100)2/9≈3).

The rationale behind using the bootstrap approach is to account for cross-sectional dependence. The results for the lag bandwidth [0, 3] are reported in Table 4. All tests are estimated in levels with and without a trend. Results indicate that the null hypothesis of no cointegration is rejected at the 5% significant level, except for two.

Table 4. Westerlund cointegration test results (constant no trend)

Statistic	*Value*	*Z-value*	*P-value*	*Robust P-value*
With constant				
Gt	-3.656	-2.369	0.009	0.005
Ga	-21.267	-1.707	0.044	0.000
Pt	-7.513	-2.042	0.021	0.030
Pa	-22.331	-2.956	0.002	0.000
With constant and trend				
Gt	-4.516	-3.646	0.000	0.000
Ga	-21.371	-0.514	0.304	0.000
Pt	-9.098	-2.880	0.000	0.005
Pa	-22.070	-1.583	0.057	0.000

Notes: Test executed with the xtwest command in stata.

With the cointegration between the variables, we go further to check the short-run and long-run relationships between the economic growth and the regressors using the PMG estimator. As all variables are in logarithmic form, we interpret their coefficients as elasticities. Table 5 suggests that the long-run coefficient of oil production to economic growth is 0.30 and significant at the 1% level. Thus, oil production enhances economic growth by around 30% in the long-run.

Table 5. Pooled mean group results

Variable	*Coefficient*	*P-value*
Long-run coefficients		
LnOilProd	0.30008	0.0000***
LnGFCF	0.144177	0.0000***
LnPOP	0.832532	0.0000***
LnELC	0.561851	0.0000***
LnINF	0.13942	0.0125**
Short-run coefficients		
ECT	-0.36059	0.0023
D(LnOILProd)	0.07405	0.3584
D(LnGFCF)	0.11699	0.0103**
D(LnPOP)	-0.19492	0.1064
D(LnELC)	-0.10474	0.1958
D(LnINF)	0.02444	0.713
@Trend	-0.00819	0.0002***
C	4.3992	0.0024***

Notes: *, **, *** demonstrate level of significance at 10%, 5%, and 1% respectively.

There is also a significant positive long-run relationship between all the exogenous variables and economic growth at the 5% level. In the short-run, economic growth and gross fixed capital formation have a significant positive relationship. This outcome is similar to Altaee et al., (2016) when examined the determinants of economic growth in Kingdom of Saudi Arabia. As for the other exogenous variables, we find no short-run impact on economic growth.

It is intriguing to find that in the long-run, inflation has a positive relationship with the GCC countries' economic growth. This indicates that high inflation rate is associated with improved economic performance, and thus suggests that inflation is helpful rather harmful to the GCC countries' economies. This result is similar to that of Al-Saedi (2015) but different to Al-Mawali (2015) where inflation shows a negative impact on the economic growth for the Kingdom of Saudi Arabia.

The results also reveal a significant positive relationship between electricity consumption and the economic growth over the time. Similar results are found for the total population as proxied by the labour force. This is in line with the positive short-term and long-term effect of the gross fixed capital formation, as productive activities need the input of labour and energy in most industrial sectors.

The ECT model coefficient indicates a mechanism to correct the disequilibrium between variables. As expected, it has a negative coefficient recording −0.36, significant at 1%. As the significant lagged ECT is relatively more efficient in establishing integration, the ECT results are efficient for establishing cointegration (Banerjee et al., 1998).

3.4 Sensitivity Analysis

Before drawing a final conclusion regarding the long-run coefficients from the PMG estimator, the analysis is extended to account for the robustness of long-run parameters by re-estimating the coefficients via panel Fully Modified Ordinary Least Squares (FMOLS), and Dynamic Ordinary Least Squares (DOLS).

The results of DOLS and FMOLS estimators are reported in Table 6. Although there are few variations in the outcome, the results are consistent in general and clearly suggest a significant long-run cointegration relationship between the oil production variable and the real GDP.

Table 6. Panel FMOLS and DOLS estimations

Variable	*FMOLS*	*DOLS*
LnOilProd	0.20846***	0.11901***
	(0.00000)	(0.00300)
LnGFCF	0.12501***	0.15629**
	(0.00470)	(0.01480)
LnPOP	0.55850***	0.61864***
	(0.00000)	(0.00000)
LnELC	0.44760***	0.40773***
	(0.00000)	(0.00000)
LnINF	0.17553***	0.05087
	(0.00900)	(0.60880)
R^2	**0.996**	**0.999**
SE	**0.0771**	**0.0516**

Notes: *, ***, and *** denote statistical significance at the 10%, 5%, and1% levels, respectively.
P-values are in parentheses.

By comparing the results in Tables 4 and 5, the findings clearly indicate a positive correlation between oil production and real economic growth in the GCC countries. This conclusion is in line with the outcomes documented by Maalel and Mahmood (2018) in their analysis of the GCC countries.

CONCLUSION

This paper investigates the 'resource curse' paradox in the GCC countries for the period 1981-2017. The findings indicate a positive relationship between oil production and economic growth in the long-run. Accordingly, this paper does not support the traditional resource curse literature. Rather, it suggests that resource abundance by itself has been a blessing for the growth and development of the GCC economies.

Moreover, the analysis found that total population, electricity consumption, and gross fixed capital formation, have significant positive coefficients in the long-run. This means that the oil sector has given the opportunity to the other factors of production to contribute to the economic growth of the GCC countries. One intriguing finding in our results is the positive relationship between inflation and economic growth. This outcome indicates that the high rate of inflation is associated with faster economic growth.

From a policy perspective, the findings of this paper indicate that policies adopted to enhance oil production in the GCC region seem to be supporting economic development without deterring the other factors of production from stimulating economic growth. Therefore, policymakers are recommended to keep adopting policies that enhance oil production. Furthermore, GCC countries are advised to increase investment in physical and human capital alongside the energy infrastructure to spur higher economic growth.

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