

## The Impact of Institutional Quality on Relation between Resource Abundance and Economic Growth

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### Abstract

This paper investigates the impact of institutional quality on relation between resource abundance and economic growth in major oil exporting countries by using panel data during period of 1996-2007. The research found that in the countries under study, institutional quality has a positive impact on economic growth, but resource abundance affected economic growth inversely. Meanwhile, natural resource abundance caused economic growth to be decreased.

**Keywords:** Economic Growth, Natural Resource Abundance, Institutional Quality, Major Oil Exporting Countries, Panel Data.

### 1- Introduction

Rich countries in natural resources grow slower on average, than countries with poor resources. This "resource curse" is an empirical documented by a number of studies, starting with the seminal work of Sachs and Warner (1995). Therefore, some economists have analyzed the resource curse hypothesis and attempted to explain it. Explanations for phenomenon include: the Dutch disease, rent seeking, natural resource price's exogenous shocks, decreasing in institutional quality and low investment in human capital.

First, one of the most alleged economic causes is the Dutch disease problem. In resource-exporting countries, sectors other than natural

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resources (typically manufacturing) are likely to suffer from real appreciation of the national currency, because natural resource earnings are absorbed in part by the domestic nontradables sector (Iimi 2007)

Second, government complacency linked to the "easy rents" generated by natural resources booms, which reduce incentives for economic reform and diversification. Easy rents often lead to high public consumption rather than investments (Hamilton and Ruta 2006).

The third category of explanation revolves around the potentially destructive role of rent seeking in resource-rich countries. Rent-seeking models are built on the assumption that resource rents are easily appropriable, which in turn leads to bribes, distortions in public policies, and a diversion of labor away from productive activities and toward seeking public favors (Torvik, 2002 cited in Bulte et al 2005)

Fourth, a further line of argument is that resources per se are not a problem; it's just that they tend to have more volatile world prices, and volatility is the problem. The fact that natural resource prices are more volatile than other prices is well established. This probably translates into greater ex-ante uncertainty for primary commodity producers, and also extends through to other sectors in resource-abundant economies. It is also well known that greater uncertainty can reduce factor accumulation through greater risk or because it raises the option value of waiting, although the magnitude of these volatility effects not known very precisely (Sachs and Warner 1997).

Finally, another strand of literature stresses the importance of institutional development in determining whether a country is likely to suffer from resource abundance. Robinson, Torvik and Verdier (2006) study the political incentives generated by resource rents in a two-period voting model and show that institutions are crucial for whether resource booms lead to lower GDP. In countries with weak institutions, resource booms raise the value of being in power and provide politicians with the money they can use to influence the outcome of elections. As a result, resource abundance leads to over-extraction and misallocation of natural resources relative to the efficient path, thus slowing down economic growth. On the other hand, high quality institutions make such political strategies infeasible or relatively unattractive which implies a positive effect of resource booms on the level of national income (Zhukova 2006)

Therefore, resource abundance affects economic growth through different channels so which the institutional quality is the most important one. The objective of this research is to study the impact of natural resource abundance on economic growth along with institutional quality in major oil exporting countries.

The rest of the paper is organized as follows. In Section 2, we refer to relationship between institutional quality and resource curse and in section 3 we review the theoretical and empirical literature on the relationship between resource abundance, institutional quality and economic growth. Building on this literature, we develop an empirical model to analyze the impact of resources and institutional quality on economic growth. This model is outlined in section 4. In section 5, we present the empirical results and robustness of findings. Conclusion is the last section of the paper.

## **2- Institutional Quality and Resource Curse**

Entrepreneurs choose between rent-seeking and productive activities. The relative profitability of productive activities depends on institutions such as the rule of law and bureaucratic efficiency. High institutional quality leads to equilibrium where all entrepreneurs are producers, low institutional quality leads to one where a portion of entrepreneurs are rent-seekers. More natural resources in turn lower national income only in the latter state. Therefore resources are a curse only where institutional quality is poor (Kolstad 2007).

The resource curses literature would be divided into three strands: a) the quality of institutions is hurt by resource abundance; b) the institutions do not play an important role, and c) resources interact with the quality of institutions such that resource abundance is accounted as blessing when institutions are fair and is associated as a curse when institutions are unfair.

1. Institutions as an intermediate causal link: This strand includes a large number of recent papers claiming that the main reason for the resource curse is a decay of institutions quality in resource rich countries. Michael Ross, for example, shows that oil dependency tend to hinder democracy.

2. Institutions have a neutral role. Sachs and Warner reject the hypothesis that institutions (or bureaucratic quality) play a role in explaining the resource curse. They conclude that institutional quality cannot explain the

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resource curse. They then revert to the "Dutch disease" explanation of the curse as the empirically relevant one.

3. Resources interact with the quality of institutions: It may be that the presence of rich natural resources in a country does not necessarily cause institutional decay. Resource abundance may nevertheless put the institutional arrangements to a test (Mehlum, Moene and Torvik 2005)

### **3- Empirical Studies**

This section is structured as follows: First, we review the natural resource curse studies maintain that rather than fueling growth and development, natural resources wealth can become the cause of economic stagnation. Second, we review literature that implying institutional quality is one of the important channels through which resource richness affects economic growth.

#### **A - Natural Resource Abundance and Economic Growth**

Sachs and Warner (1997) show that economies with a high ratio of natural resource exports to GDP in 1970 tended to grow slowly during the subsequent 20-year period 1970-1990. Leite and Weismann's (1999) evidence also supports the resource curse hypothesis. Capital-intensive resource industries tend to induce more corruption, hampering economic development.

Papyrakis and Gerlagh (2004), focusing on the transmission channels through which resource abundance affects economic growth, show that the indirect, negative affects of macroeconomic policies, such as trade openness and educational investment, outweigh the direct, positive resource effects.

Ding and Field (2005) distinguish between natural resource dependence (RD) and the natural resource endowment (RE). They estimate three models, using World Bank data on national capital stock and show that in a one-equation model RD has a negative effect on growth rates, apparently confirming the main results of the resource curse literature. RE, however, has a positive impact on growth. Then, estimate a two equation model, in which the impacts of RE are much weak. Finally, they estimate a three equation model, in which the impacts of natural resource on growth disappear.

Isham, et al. (2005) show that export concentration in minerals, fuels and plantation crops is strongly associated with weak public institutions which are, in turn, strongly associated with low growth. They find that the main channel through which export structure affects growth is via institutions. Ng (2006) by using proxies for resource abundance, find empirically that there is no significant relationship between resource abundance and GDP growth rates. Moreover, resource-abundant countries on average have higher levels of GDP than resource-poor ones.

Papyrakis and Gerlagh (2007) find that natural resource abundance decreases investment, schooling, openness, and R&D expenditure and increases corruption, and these effects can fully explain the negative effect of resource abundance on growth.

#### **B- Resource Abundance, Economic Growth and Institutional Quality**

The role of institutional quality in determining the effects of natural resources has been widely recognized in the literature.

Alayli (2005) concludes that it is not natural resources that are the problem; rather, it is lack of good governance and democracy. By increasing the transparency of resource payments by firms to governments, increasing government transparency in the management of resource revenues, restricting the trade of high-risk, income from these natural resources can be used to support growth and development.

Bulte et al (2005) by investigate the relationship between resource abundance and several indicators of human welfare find that, given an initial income level, resource-intensive countries tend to suffer low levels of human development. While they find only weak support for a direct link between resources and welfare .But there is an indirect link that operates through institutional quality. Iimi and Ojima (2005) through simple endogenous growth model with exhaustible natural resources, empirically find that natural resources do generally slow growth but that for effective government, resource richness is an appropriate tool for economic development.

Zhukova (2006) examines the threshold hypothesis for the rates of economic growth, without employing the mechanism of rent seeking. He concludes that, resource abundance positively affects the rates of economic

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growth for countries with natural resources below some threshold level, and negatively – otherwise. He also, shows that the threshold is positively related to institutional development, which explains why countries with strong institutions are less prone to suffer from resource curse.

Brunnschweiler (2007) re-examines the effects of natural resource abundance on economic growth by using new measures of resource endowment and considering the role of institutional quality. She find a positive empirical relationship between natural resource abundance and economic growth during 1970-2000, which strengthened by sound institutions. Kolstad (2007) empirically tests the impact of the private versus public sector institutions on the resource curse, by using cross-country data from Sachs and Warner (1997a) and Polity IV. The main result of his finds is that only improved private sector institutions ameliorate the resource curse.

Iimi (2007) by using cross-country data studies effects of natural resource on economic growth with considering institutional quality (rule of law, anticorruption policies, transparency and accountability in the public sector) and find good institutions are much important for effective natural resource management and growth.

### **4- Methodology**

To examine the relationship between natural resource abundance, economic growth and institutional quality, this paper follows the empirical growth:

- Cross-section growth studies such as Mankiw, Romer and Weil (1992)
- Barro and Sala-i-Martin (1995) and Barro (1997)
- Economic growth empirical studies in resource rich countries for example Sachs and Warner (1995a, 1997, 1999 and 2001) and Iimi (2007)

We use the following linear growth regression model:

$$g_{it} = \alpha_0 + \alpha_1 FUEL_{it} + \alpha_2 \theta_{it} + \alpha_3 FUEL_{it} * \theta_{it} + \alpha_4 n_{it} + \alpha_5 TRA_{it} + \alpha_6 X_{it}' + \varepsilon \quad (1)$$

Where

$g_{it}$  = real per capita growth rate,

Fuel= Fuel exports (% of merchandise exports) as a proxy for natural resource abundance,

$\theta$ = one of the institutional quality indicators, which extracted from the World Bank dataset covering different dimensions of governance from 1996 onwards (Kaufmann& Kraay and Mastruzzi 2008). In this paper we use four indicators include: voice and accountability, control of corruption, rule of law and government effectiveness.

n= Population growth rate

TRA= a proxy representing the degree of trade openness

X= includes two exogenous control variables: log of the initial GDP per capita and human capital measured as secondary education, general pupils per thousand people.

All of these variables except  $\theta$  extracted from 2008 World Development Indicators of the World Bank.

i denotes for 33 countries which includes 22 oil economies and other 11 oil exporting countries. Meanwhile, the study period is 1996-2007.

In a first approach, we depict in figure 1 the relationship between the specialization in natural resources, measured by fuel exports and the growth rate of GDP per capita in 1996-2007 periods, for a cross- section of 22 oil countries.

Results depicted in figure 1, and the ones of table 1 for a sample of 22 countries show the negative relationship between fuel exports and growth.

## 5- Empirical Results

Table 1 presents the estimation results with pooled EGLS. There are several findings: First, the coefficients of natural resources are negative and statistically significant. This evidence supports the resource curse hypothesis found in earlier studies (see, for example, Sachs and Warner, 1995a, 1997, 1999, 2001 and Salai-martin and Subramanian, 2003). In other words, in oil economies, many oil exporting decreased their economic growth.

Second, the negative coefficients associated with initial GDP per capita imply that there is a conditional convergence in national incomes. The coefficients of population growth are significant and negative and consistent with earlier researches. Also, relationship between human capital and economic growth is positive and significant. This result is consistent with

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theories and indicates the importance of human capital on economic growth in oil economies.

Institutional quality has a positive effect on economic growth; therefore, by increasing the control of corruption, increasing government transparency and government effectiveness in the management of resource revenues, economic growth would increase in rich-countries.

The coefficient of trade openness is significant and positive. This evidence supports the conventional argument promoting trade liberalization.

The interaction terms between resource abundance and institutional quality have significant negative coefficients.

As we know, resource dependence can affect economic growth in two ways: directly, or through its impact on institutional quality. Therefore, total effects of resources on economic growth are as follow:

$$dg/ dFUEL = \alpha + \beta\theta \quad (2)$$

Where  $\alpha$  is direct effect of resource abundance on economic growth,  $\beta$  is indirect effect (coefficient of interaction term) and  $\theta$  is average of institutional quality indicator in study period. We find a negative effect of natural resource dependence on institutional quality. Therefore, indirect effect of resource abundance on economic growth through institutional quality channel is negative. In other hand, natural resource abundance in oil economies led to decrease in institutional quality which caused to reduction in economic growth.

### **6- Robustness**

In this section for results robustness, we investigate relationship between natural resource abundance, economic growth and institutional quality in other oil exporting countries. In these developed countries share of fuel exports to merchandise exports is low. This group includes: Australia, Austria, Belgium, Canada, Denmark, Estonia, Lithuania, Netherlands, Norway, Poland, and United Kingdom.

Table 2 presents the EGLS estimation results for other oil exporting countries. The estimation results indicate that coefficients of explanatory variables are similar to previous model. The major difference between the

samples oil economies and other oil exporting countries lies in the different coefficients of interaction terms between resource abundance and institutional quality. In this group the interaction term between resource abundance and institutional quality have a positive effect on economic growth.

Four aspects of institutional quality seem to be particularly important for natural resource management. First, voice and accountability, as measured by the political process, civil liberties, and political rights, indicates the ability to discipline those in authority for resource extraction. Without monitoring by the citizens and a process by which those in power may be selected and replaced, resource rents to be dissipated. Second, government effectiveness, measured by the quality of public service provision, the quality of the bureaucracy and the competence of civil servants, also needs to be high. If the government cannot produce and implement good resource management policies, resource wealth will be overexploited and rapidly exhausted.

Third, rule of law, measured the success of a society in developing an environment in which fair and predictable rules from the basis for economic and social interactions, it is important to keep strengthening rule of law demonstrably one of the keys to fair natural resource management.

Finally, anticorruption policies are essential for fair and transparent distribution of resource benefits. Control of corruption is positively associated with economic growth; indicate that, even if resources are a curse, improved institutional quality can help overcome this obstacle. Countries with better institutions tend to have more control over corruption and rent seeking.

In our analyses, institutional quality can offset the impact of the fuel resource curse. This suggests that improvements in institutional quality can mitigate the curse of fuel resources. This might explain why some countries, such as Norway, have both high levels of fuel exports and high economic growth.

## **7- Conclusion**

It is a tragedy each time we observe a country with natural resource abundance to go down a path of corruption, conflict, and underdevelopment. The natural resource curse represents as an enormous impediment to

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development. It is important, however, to realize that it is not natural resources that are the problem. Rather, it is the lack of fair institutional quality which hinders the growth and development.

This paper examined the relationship between natural resources, institutional quality and economic growth in oil exporting countries. The empirical results indicate that in oil exporting countries institutional quality has a positive effect but resource abundant has a negative effect on economic growth. Meanwhile, natural resource abundance led to decrease in institutional quality which it caused to reduction in economic growth. Therefore, in oil economies not only high oil revenues did not increase economic growth but also through deteriorating institutional quality decreased economic growth. While, in other oil exporting countries, indirect effect of natural resource on economic growth through institutional quality channel is positive and it could mitigate negative impacts of resource abundant on economic growth. It means that in these countries, through a right planning, oil revenues channeled to increase economic growth. While, in oil economies institutional quality should be important in order to increase nation wealth. Also, in the last countries improving of human capital for accelerating of economic growth is required.

List of sample countries:	
Oil economies*	Other oil exporting countries
Algeria	Australia
Angola	Austria
Bahrain	Belgium
Congo	Canada
Ecuador	Denmark
Gabon	Estonia
Iran Islamic Rep	Greece
Iraq	Lithuania
Kuwait	Norway
Libya	Netherlands
Nigeria	Poland
Oman	United Kingdom
Qatar	
Saudi Arabia	
Sudan	
Syrian Arab Rep	
Trinidad and Tobago	
United Arab Emirates	
Venezuela, RB	
Yemen, Rep.	

\* Source: UNCTAD 2008, p.17

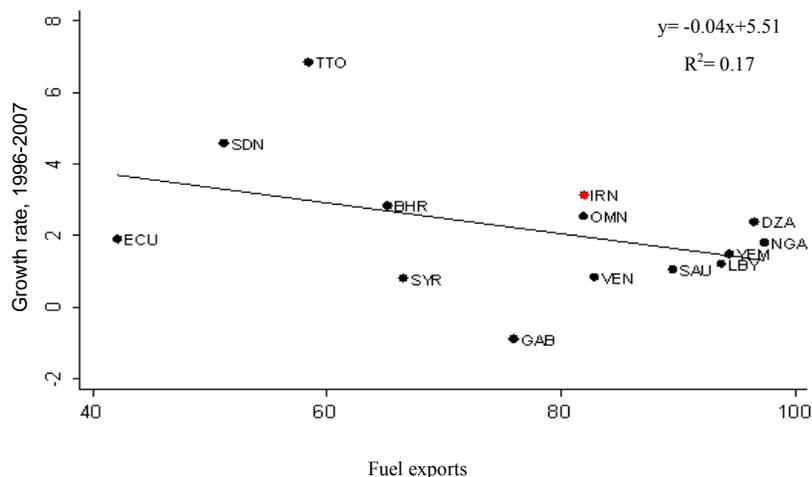


Figure 1: Exports of natural resources and per capita growth

Source: Data from World Bank (2008).

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**Table 1: Estimation Results for Oil Economies**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
C	20.14 (2.73)*	12.44 (5.26)*	8.97 (8.24)*	11.65 (3.65)*	13.97 (4.97)*	14.03 (2.96)*	11.61 (3.36)*
LNGDP	-1.70 (-2.05)**	-0.51 (-1.80)***	-0.70 (-4.42)*	-0.83 (-2.12)**	-0.45 (-1.32)	-0.44 (-0.85)	-0.08 (-0.19)
N	-1.08 (-2.87)*	-0.76 (-2.36)**	-1.32 (-7.36)*	-1.20 (-5.69)*	-0.56 (-1.74)***	-0.89 (-3.61)*	-0.98 (-3.34)*
FUEL	-0.02 (-0.73)	-0.05 (-2.71)**	-0.01 (-4.47)*	-0.01 (-1.69)***	-0.09 (-1.92)***	-0.08 (-2.81)*	-0.08 (-2.67)**
HUM	0.002 (0.08)	0.02 (3.06)*	----	----	0.03 (3.81)*	0.009 (1.14)	0.007 (0.68)
TRA	----	----	0.02 (4.38)*	----	----	----	----
VOI	----	1.99 (3.04)*	----	----	5.82 (2.12)**	----	----
VOI*FUEL	----	----	-0.01 (-3.94)*	----	-0.06 (-1.34)	----	----
GOV	----	----	----	----	----	5.75 (2.18)**	----
GOV*FUEL	----	----	----	----	----	-0.06 (-1.96)***	----
COR	3.39 (2.49)**	----	----	----	----	----	5.53 (2.22)**
COR*FUEL	----	----	----	----	----	----	-0.07 (-2.02)***
RUL	----	----	----	0.90 (1.03)	----	----	----
RUL*FUEL	----	----	----	-0.003 (-0.47)	----	----	----
R-squared	0.34	0.53	0.41	0.31	0.58	0.42	0.40
Number of observation	41	41	73	77	41	41	41
F-statistics probe	0.67 (0.77)	0.67 (0.78)	0.97 (0.49)	1.67 (0.08)	0.64 (0.80)	0.59 (0.84)	0.60 (0.83)

Source: Data from World Bank (2008) and Kaufman et al (2008).

Notes: t-statistics in parentheses; \*, \*\*, and \*\*\* indicate significance at the 1, 5, and 10 percent levels, respectively.

**Table 2: Estimation Results for Other Oil Exporting Countries**

	(1)	(2)	(3)	(4)	(5)	(6)
<b>C</b>	17.29 (16.48)*	17.63 (10.71)*	23.79 (4.20)*	25.22 (3.03)*	29.23 (3.47)*	19.96 (5.90)*
<b>LNGDP</b>	-2.06 (-17.51)*	-2.03 (-9.18)*	-2.35 (-3.10)*	-2.55 (-2.33)**	-3.16 (-2.89)*	-2.52 (-14.17)*
<b>N</b>	-0.87 (-3.76)*	-0.77 (-2.55)**	-0.46 (-0.71)	-1.06 (-1.80)***	-0.88 (-2.67)**	-0.33 (-6.01)*
<b>FUEL</b>	-0.24 (-6.14)*	-0.16 (-2.81)*	-0.05 (-0.90)	-0.16 (-3.14)*	-0.19 (-1.85)***	-0.18 (-2.66)**
<b>HUM</b>	0.07 (7.96)*	0.06 (4.83)*	0.03 (6.32)*	0.04 (7.69)*	0.05 (3.89)*	0.08 (4.91)*
<b>TRA</b>	0.02 (9.16)*	0.02 (5.56)*	----	----	----	0.02 (4.98)*
<b>VOI</b>	----	----	----	----	----	0.91 (1.71)***
<b>VOI*FUEL</b>	----	----	----	----	----	0.13 (3.16)*
<b>GOV</b>	----	----	----	----	1.23 (0.97)	----
<b>GOV*FUEL</b>	----	----	----	----	0.11 (2.00)***	----
<b>COR</b>	----	----	0.17 (0.20)	----	----	----
<b>COR*FUEL</b>	----	0.09 (3.23)*	0.03 (1.37)	----	----	----
<b>RUL</b>	----	----	----	0.50 (0.34)	----	----
<b>RUL*FUEL</b>	0.14 (6.87)*	----	----	0.09 (4.18)*	----	----
<b>R-Squared</b>	0.89	0.85	0.73	0.73	0.75	0.98
<b>Number of observation</b>	37	37	37	37	37	37
<b>F-Statistics Probe</b>	1.35 (0.27)	1.65 (0.16)	1.78 (0.13)	1.39 (0.26)	1.32 (0.29)	1.51 (0.21)

Source: Data from World Bank (2008) and Kaufman et al (2008).

Notes: t-statistics in parentheses; \*, \*\*, and \*\*\* indicate significance at the 1, 5, and 10 percent levels, respectively.

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