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## **HOW CAN IRAQ AVOID AN OIL CURSE? EXPERIENCES FROM NORWAY AND BOTSWANA. By Dr. Ahmed Hussein Al-Badri\***

### **Forward**

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### **Abstract**

This research paper aims at explore the strategies and plans which natural resources-rich countries, such as Norway and Botswana have followed in order to avoid the oil curse and to what extent these strategies and plans can be applied in Iraq. Furthermore, the paper aims to show to what extent oil, quality of institutions (QI), and diversification in Iraq can be linked to economic growth.

Panel data analysis over the period 1995-2018 for (17) oil-rich countries as proxy for data of Iraq has been used to test the linear and non-linear impact of oil rents on economic growth, to examine the main symptoms of the resource curse phenomenon by using two systems: Generalized Method of Moments (GMM) estimator and Fixed Effects (FE) models. The findings of both systems indicate that the economic growth in Iraq is greatly and positively influenced by oil rents. Thus, our results confirm the classical theory that abundant natural resources could promote growth, since resource richness can give a “big push” to the economy through more investment in economic infrastructure. By these results, any resource-rich country must attain higher growth rates. Therefore, we reject the resource curse hypothesis introduced by Sachs and Warner (1995, 1997a, 1997b, 1999, 2001) and Murphy (2000). On the other side, we see that the phenomenon of resource curse in Iraq is a consequence of poor quality of institutions and bad strategies, as our results showed. In fact, the financial resources that come from the sale of oil in Iraq are not directed to investment in

infrastructure, like Norway and Botswana, but they are directed to salaries, wages, with this attitude, Iraq cannot avoid oil curse like Norway and Botswana. Moreover, our data has been diagnosed with resource curse when we take into account the interaction terms between oil and each of the (QI) indices. We found out that if the (QI) indices reach certain limits, oil rents will start to create negative impact on growth. This result seems to confirm the theory of the natural resource curse, and to confirm that Iraq is associated with poor (QI). The results, correspondingly, show that diversification (DIV) has been frustrated by oil rents because economy of Iraq depends on oil rents, which encourage rent-seeking activities, but the multiplicative interaction terms between (QI) and oil rents indicate that the combined effect of these two variables is an effective factor to promote economic growth.

## 1. Introduction

The impact of natural resources on economic development is a subject of global debate between the economists, not only at the local level but also on the global level. Mills and Alhashemi (2018) debate that an abundance of natural resources can exacerbate instability, something that is evident in Iraq. Iraq has been an oil-dependent country long before the current political system was installed after the U.S.-led invasion and occupation of Iraq. Pre-2003 absence of democracy, post-2003 distorted democracy, authoritarianism, personalism, militarization and military adventures, beside the disagreement between the Federal Government and Kurdistan Region Government on oil management has been in place for 16 years caused political and economic instabilities. Ross (2001) showed how access to oil rents has bolstered authoritarian regimes in many of natural resources-rich countries, in addition to narrowing the economic base as a result of the Dutch Disease, as currency appreciation makes imports cheaper and exports not denominated in dollars more expensive. In the 1980's, most of the studies observed that countries that depend heavily on their natural resources, tend to suffer from many macroeconomic problems, such as less investment, lack of equality and political right and more corruption compared to other countries that depend less on natural resources, which led to decrease in economic growth (Gylfason, 2006). This phenomenon is called the Dutch Disease, whereby labor and capital move from non-oil sectors to the oil sector and, at the same time, vast amount of foreign currency enters the economy, which leads to appreciation of the domestic currency (ULUSOY & TAŞ, 2017). Also, the Dutch Disease causes the decline in growth of the manufacturing sector (Horváth and Zeynalov, 2016). Recourse curse theory is stated by Sachs and Warner (1995), and Auty (2001), which says that natural resource abundance decreases economic growth. Later on, other studies have provided brief review of the literature that reports on the connection between QI and economic growth with reference to the resource curse. They address the impact of natural resources on economic growth through institutions (Karabegović, 2009). In the 1990's, Ulusoy and Tas (2017) claimed that the quality and efficiency of institutions in resource rich countries had changed government behaviors. Researches in this period showed that weak institutions negatively affect growth and development and vice versa. The New Institutional Economy School (NIES) has led us to better understand the improvement process of societies by adding institutions and property rights into the analysis. The studies carried out have revealed that there is an increase in welfare in those societies where entrepreneurs feel that both they and their investments are safe and in which laws and rules are applied; on the other hand, there is weakness in the development of those societies where agreements are weak or lacking (Rodrik, 2004 in Haydaroglu, 2015).

For these significant issues, we need to test and answer multiple questions such as why does Iraq have natural resources curse while its blessing in other countries such as Norway and

Botswana? Is Iraq able to diversify its economy under its weak QI? Do natural resources have direct or indirect effect on economic growth?

What are the main differences of this study from other papers? First, we answered this question: how may Iraq learn lessons from successful natural resources-rich countries, specifically Norway and Botswana, which have achieved a hop in economic development? Second, we prepared this paper to be a policy document for the decision makers to take necessary steps to reform the economic situation in Iraq. Developing a strategy and future vision for sustainable development and economic diversification in Iraq has become an urgent necessity to overcome the impasse in economic decision-making. A comprehensive and effective strategy in reforming, managing and organizing the national economy, ridding off its reinter nature, activating the role of and partnership with the private sector, and developing programs and plans that will develop the productive and service sectors in order to diversify sources of income and wealth, in light of the availability of political will and commitment, credibility, transparency and accountability in economic and environmental decision-making. However, any economic reform has to be preceded by political reform and massive anti-corruption efforts. Third, to attempt to answer the question: why natural resources-poor economies are growing faster than natural resources-rich economies? Something that Sachs and Warner argued for through series of research papers. Finally, to best of our knowledge, this study has linked between diversification and its interaction term with natural resources, institutional quality, and economic growth.

This study reached several results. First, we don't agree with the conclusions of Sachs and Warner (1995) and Sala-i-Martin (1997), who argued that the empirical evidence of a natural resource curse indicated negative impact of natural resources on economic growth. but our empirical results are strongly positive and significant. Also, our findings are consistent with classical theory, which assume that an abundance of natural resources is a blessing for economic growth. Second, we observe that the coefficient of interaction term (between oil rent and diversification) is positive. This finding indicates that diversification has a significant impact on reducing the resource curse.

Eventually, this paper comes argues against papers which indicate that the natural resources abundance is curse, not blessing! And here, we also disagree with the famous saying, "experience is the greatest proof". The failure of achieving sustainable economic development over the past decades in Iraq is not because Iraq has oil, but it's the absence adequate policies, strategies and plans to develop Iraq's economy. We are not able to deny the significance of oil for achieving a leap economic development in Norway's economy.

In the same way, achieving a leap in economic development in natural resources-poor countries such as Singapore, South Korea, Hong Kong, Taiwan, and China refer to export-oriented and -led economies, but with sophisticated financial and trading markets and injection of large amounts of foreign investment. Since the late 1990s, the Asian Tiger economies have recovered relatively well and are major exporters of goods such as technology and electronics. Yet, the Asian Tiger countries had then import restrictions to help promote the development of local industries and boost export-led GDP growth. Later, Singapore and Hong Kong began to normalize trade by allowing an increase in the free trade of goods and services. South Korea is a modern economy that has developed into one of the most prosperous Asian economies with its production and exports of automobiles, robotics, electronics, and software. We partly agree with theory of Ross (2001), who sees the natural resources abundance playing an important role in stimulating conflicts and political and economic instability, but we argue strongly that the will of the people to create a democratic system and economic progress, is stronger than the will of the corrupt and

incompetent politicians. If there are serious steps for economic reform in Iraq, it have to begin with fighting political corruption first, just like successful natural resources-rich countries (Norway and Botswana) did. Nowadays, the Iraqi people do not trust their government, then they will definitely not cooperate with any economic reform such as increasing taxes, expanding the tax payers' base and devaluating the Iraqi Dinar. As expected, adopting new vision, policies and strategies and taking actions towards economic reform in Iraq shall encounter strong reaction by the people in the absence of public awareness and interaction.

The remainder of the paper proceeds as follows. The next section provides review of relevant literature. Section 3 reviews the successful strategies of some natural resources-rich countries while Section 4 presents our data. Section 5 analyzes the econometric model and methodology. Section 6 discusses our main results. Section 7 provides concludes.

## **2. Literature Review**

In this section we will briefly discuss the relevant literature that focuses on the relation between natural resources, economic growth, (QI), and (DIV). We start with more significant study of Sachs and Warner (1995) study. It is the first significant and systematic one regarding economic problems associated with natural resources. They observed that economies with a high ratio of natural resource exports to GDP had slower economic growth from 1970 to 1990 than the world average (1997a, 1997b, see also 1999, 2001). Also,, they asserted that natural resource abundant countries tended to have larger service sectors and smaller manufacturing sectors than resource-poor countries. There is likewise evidence that natural resource abundant countries tended to have slower growth in exports of manufactures than did resource poor-economies (Sachs and Warner, 1999). Sala-i-Martin (1997) stated that the goal of his paper "four million regressions" is to test which variables are more important for economic growth. He also observed 22 significant variables in economic growth such as natural resources having negative impact. In other words, he confirmed the same findings reached by Sachs and Warner. Auty (2000) also studied 70 developing countries and found that, in natural resource-rich countries, corporate institutional weakness was spotted and, due to limited (DIV) in manufactured goods, led to constrained economic growth in these countries. In 2001, Auty, 2001 and Gylfason (2001a) observed a shift of both labor and capital from the manufacturing sector to the resource sector and the non-tradable sector. The manufacturing sector may also be harmed through wage increases. If the booming natural resource sector has significant rents, resource firms are able to raise wages to attract an increasing number of employees. This forces the manufacturing sector to bid for employees by offering higher wages, putting it at a competitive disadvantage. A booming resource sector also implies increased competition for capital (Gylfason, 2001a). Gylfason and Gylfi (2006) demonstrated an additional indirect effect of natural resources on growth through civil liberties. Finally, civil liberties have also been used as a proxy for the (QI) (Gylfason and Zoega, 2006), which has been argued to be an important determinant of the effect of natural resources (Mehlum, Moene and Torvik, 2006).

Ulusoy and Tas (2017) analyzed the relation between institutions on cross-country economic development in natural resource-rich countries and OECD countries. The paper emphasizes the effects of economic freedom that interacts with total resource rents on total factor productivity, covering 30 Natural Resource Rich, 34 OECD countries in dynamic panel data for the period of 2000-2013. Findings suggest that as economic freedom increases along with

resource rents, total factor productivity increases for natural resource rich countries. The results are mixed for OECD countries. Furthermore, they observe that the coefficients of total resource rents appear to be significantly positive in the OECD countries but negative in natural resource rich (NRR) Countries. The negative effects of natural resources rent on total productivity growth are consistent with the resource curse hypothesis.

Now, we will briefly discuss the relevant literature that focuses on natural resources in the Middle East and North Africa (MENA). For instance, Matallah & Matallah (2016) confirmed the robust relationship between oil rent and growth and diagnosed resource curse in 11 MENA oil exporters. They also showed that governance is a key ingredient in the diversification recipe, while oil rents frustrate economic diversification by encouraging rent-seeking activities. The multiplicative interaction term between the governance index and oil rents indicates that the combined effect of these two variables is effective in promoting diversification. Using a sample of 16 MENA countries over the sample period 1995-2005, the paper analyzed determinants of institutional quality based on six separate governance indices. The determinants under consideration include measures of economic freedom by the Cato Institute and the Heritage Foundation, indicators of policy quality, real per capita GDP, risk rating and the degree of openness. Five measures of institutional quality increase real GDP growth significantly across MENA countries. In contrast, institutional quality has negative impact on the growth of private credit and private investment. Further, the combined evidence does not suggest that improvement in institutional quality is a major factor in attracting FDI flows to MENA countries (Kandil, 2009).

### **3. Successful Strategies of Natural Resources-Rich Countries**

In this section, our goal to answer this question: to what extent can the Norwegian or Botswanan experiences be copied by Iraq?

#### **3.1. Norway**

Norway is often referred to as the prime example of a country that has achieved high growth and low income inequality despite its vast natural resources (Mehlum, MoeneOrvik 2011). This contrasts sharply with Iraq and with many other resource abundant countries, which raises the questions why Norway has succeeded while Iraq did not. That is our main goal in this section. To proceed, we need first to find out how Norway differs from Iraq, which suffers from less favorable development. Thereafter, we turn to a more detailed description and investigation of the policies adopted in Norway, and discuss if there are opportunities for Iraq to learn from Norwegian experiences.

First, Norway has established Petroleum Fund (recently, it was called the Pension Fund). The Pension Fund should be invested in a diversified portfolio abroad. Each year, the expected real return from the Pension Fund should be transferred back to cover the non-oil structural budget deficit on the government budget. In line with this, Iraq should stop using all oil revenues to support salaries and wages, then should, at least, use a the larger portion of the revenues to support other sectors. Second, number of other policies were adopted on different areas. The regulation and taxation systems should ensure that the oil revenues were exploited in a safe and profitable way, and that the bulk of the oil revenues were reaped by the state. Third, policies for the management and spending of the petroleum wealth have assumed more importance with adoption of the Ten Oil Commandments, unanimously adopted by the Norwegian Parliament (Stortinget) in June 1971 and the establishment of the Petroleum Fund (now the GPF) in 1990, and the adoption of the fiscal

rule in 2001 (Holden, 2011). The Ten Commandments is an act of self-discipline that, among other things, provides protection to the fund, establishes that nothing can be withdrawn from the fund until the oil runs out, the government cannot use more than 4% for current expenses, and none of the investments from the fund can be placed in Norway. Fourth, Norway's aim was to obtain a significant Norwegian participation in the oil industry, so that Norwegian companies could build up experience and expertise and take part in the oil and gas sector. Fifth, regarding the institutional aspects related to rule of law and property rights, a likely reason for Norway's positive development is the early industrialization and late oil discovery. Moreover, when Norway became oil-rich, it already had a long and stable tradition of democratic rule. It also had a well-functioning state bureaucracy. All this contrasts with the situation in Iraq, whereby Iraq is in political and economic chaos. Iraq's oil sector has generated substantial revenue since 2003 but institutional weaknesses have hindered effective allocation and utilization of these resources. The proceeds from the sale of oil exceeded \$850 billion between 2003–2018, a period of steadily rising production and generally favorable international prices. However, poor governance, public financial management (PFM) weaknesses and capacity limitations have diverted these windfalls away from essential investment in human and physical capital towards recurrent spending, notably public sector wage bill, little has been saved in financial assets. As a result, Iraq's development needs remain large, with wide infrastructure gaps, and difficult social conditions, highlighted by unrest last summer over the poor quality of water and electricity, and high unemployment (IMF, 2019).

Back to Norway, wasteful activities were thus held in check by democratic governance, based on broad political representation with checks and balances in civil society. In turn, the industrialization which the resources generated implied growth in the labor movement, and it was in the interest of this labor movement to promote a political system ensuring that the resource wealth benefit broader groups of the population. Thus, when the oil era came, the institutions of Norway were already well prepared to ensure that this resource wealth would be to the best interest of the population. In addition, new institutions and arrangements were created to ensure sustainable use of the resource wealth.

### **3.2. Botswana**

Botswana is one of the most of countries that is endowed with natural resources (Diamonds, Copper, Colden, and Nickel). According to the statistics of the World Bank, Botswana is considers the 18<sup>th</sup> largest resource exporter among (161) countries for which data are available. Its wealth of diamonds seems to have contributed significantly to its strong economic growth. From 1970 to 2010, incomes in Botswana increased by an average of (6.3) percent annually almost triple the average growth rate of high-income countries. While Botswana benefited from the discovery of diamonds, the question is: Does the diamond wealth fully explain Botswana success. We can answer that question by saying it doesn't fully explain its success. So, why was Botswana successful? In fact, it succeeded because of good governance. An accountable government made sure that windfalls from natural resources were spent wisely; they spent revenues to investment, and this isn't the case with Iraq, which is one of the reasons behind Iraq did not succeed.

Iimi (2006) stated that Botswana has experienced the most remarkable economic performance in Africa. The quality of regulation, such as the predictability of changes of regulations, and anti-corruption policies, such as transparency and accountability in the public sector, are most important for effective natural resource management and growth. Another reason for achieving remarkable growth to date is that Botswana has sound

institutions and good governance. As to how Botswana has been successful in developing a solid institutional structure, see Acemoglu, Johnson and Robinson (2002). They pointed out that Botswana's good institutions, particularly in the private property area, have stemmed from its pre-colonial political institutions, limited British colonialism, strong political leadership since independence and the elite's motivation to reinforce institutions.

The most recent papers that address this topic mentioned that natural resources- rich countries tend to face three main challenges, the first of which is the Dutch Disease problem. It is the case that describes the appreciation of a country's currency due to natural resource exports, making local industries less competitive internationally. As a resource-rich developing country, Botswana was little affected but Iraq did. Therefore, Iraq should follow new strategy to avoid appreciation of the Iraqi's currency. In Botswana, the Dutch Disease essentially comes down to supply and demand, since foreigners had to exchange their currency for the Botswanan pula to buy Botswana diamonds. The pula increased in value because more foreign currencies were exchanged for a limited amount of pula. Since the pula was pegged to the US dollar and later to the South African rand, the Botswanan monetary authority couldn't allow the pula to appreciate, as the exchange rate they had set would have deviated from the market's exchange rate. Botswana maintained the peg by printing more pula and buying foreign currency. This increased the supply of pula and decreased the pula's value, ensuring the exchange rate remained at the set rate.

Second is economic volatility. Commodity prices tend to fluctuate significantly, which means huge economic uncertainty for countries dependent on natural resources. In fact, countries where natural resource exports comprise more than 19 percent of the GDP have standard deviation of output growth as high as 7.37 percent. This volatility brings two problems. First, a government's balance sheet may become negative when resource prices drop, exacerbated by fiscal policy that tends to be expansionary in times of growth and contractionary in recessions. Countries with large surpluses due to high resource prices naturally tend to increase spending because they don't foresee a steep drop in resource prices; thus, they fail to save money for when commodity prices do inevitably drop. Price drops force governments to cut back on spending, making an economic slowdown even worse. The second negative effect of commodity price volatility is that foreign direct investment may shy away from an unstable economy. Foreign investors fear that investments in a resource-dependent economy are likely to lose value from commodity price drops, so they tend to opt for investments in more predictable economies. Botswana, however, avoided the negative effects of commodity price volatility by saving the revenues made from diamond mining. Also, Botswana established the Public Service Debt Management Fund and the Revenue Stabilization Fund, which provided the government revenues from diamonds over time, instead of all at once. This largely ameliorated the volatility of resource windfalls.

The final component of the resource curse is the probability that resource dependence heightens tensions, corruption and even violence within the affected country. Typically, government workers are perceived as underpaid and underappreciated, but in resource-rich developing countries, where the government often controls natural resource revenues, government positions are the route to wealth and success. When the government becomes the locus of material success, it attracts individuals seeking to enrich themselves, often through corrupt measures. Further, factions may compete aggressively or violently to obtain control of the government and its resource windfalls. An abundance of natural resources can thus produce corruption, unrest and even civil war in the absence of strong rule of law, especially in developing countries (Busse and Gröning, 2010). The same study found some

negative correlation between natural resource abundance and the quality of government bureaucracies. Corruption is extremely damaging to a developing country: it hurts the poor, increases income inequality, robs the government of revenue and discourages foreign investment. As such, corruption is a powerful anti-development force. Botswana's success can therefore be partly explained by its handle on corruption; Botswana is ranked the 34th least corrupt country globally – and the least corrupt country in Africa – on Transparency International's 2017 Corruption Perceptions Index. That feat is a result of successful governance following Botswana's independence. By encouraging accountability and consensus-building following independence, newly-minted bureaucrats continued to focus on their country's future instead of being swayed by cynicism and potential for personal profit.

#### **4. Data and Variables**

We collected our data from multiple sources that utilize a strong balanced panel data. Our data involved 17 oil-rich countries and covered period 1995-2018. Considering that Iraq has the most undiversified revenue bases of oil exporters among these 17 countries, Iraq is correspondingly more vulnerable than most to oil price movements. Because of the lack of dataset for Iraq for long period, we used data for 17 countries as proxy for data of Iraq. Most of these countries have almost the same situation of Iraq economy. The dependent variable is GDP per capita (thousand US\$) obtained from World Bank (WB). The main variables in our regressions are the ratio of oil rents to GDP, petroleum production, diversification, and quality of intuitions. We were not able to include the time period prior to 1995 in our study due to the unavailability of (QI). According to World Bank's World Development indicators (WDI),, in 2011, on average, oil rents constitute 80% of total natural resources rents across sample countries (Farhadi, Rabiul and Solmaz, 2015).

#### **5. Methodology**

To verify our hypotheses, we used two models: the generalized method of moments (GMM) and Fixed Effect (FE). The GMM is developed for dynamic models of panel data. Most previous studies faced the problem of indigeneity, measurement errors and omitted variables. Panel data solves omitted variables problem by considering country's specific and time-specific effects. GMM estimation method helps overcome the problems of indigeneity problem. Serial correlations based on the GMM residuals were tested by Aurellona-Bond estimator and over identifying restrictions are tested by Sargan tests (Ulusoy and Tas, 2017). Arellano and Bond (1991) estimator includes all possible instrument variables in GMM. The deficiency of this difference equation is that it does not include country specific effects. Arellano and Bover (1995) first developed system GMM estimation method, which considers the difference and level equations together and considered to be more effective (Ulusoy and Tas, 2017).

We have used the fixed-effect model after we run Hausman test, hence, the results suggest that the fixed effects model is the appropriate one. The Hausman chi-square test statistic is statistically significant at the 1% level of significance, then the null hypothesis is rejected in favor of the alternative hypothesis. In this study, we used different sets of equations, by adding diversification variable as an independent variable, to test the effect of diversification variables in resources-rich countries, we have also used different variables of resources like oil rents and petroleum production, case of 17 countries. However, we proceed with an estimate the following baseline FE model:



$$GDP_{i,t} = a + \beta_1 ATEP_{i,t} + \beta_2 Oil_{i,t} + \beta_3 petroleum_{i,t} + \beta_4 NR + \beta_5 DIV_{i,t} + \beta_6 IND_{it} + \beta_7 AGR + \beta_8 SER + \mu_i + \varepsilon_{i,t} \dots (1)$$

$\mu_i$  captures unobservable time-invariant country-specific effect and accounts for any country-specific effect that is not included in the regression. Characteristics.  $\varepsilon_{i,t}$  the time-varying error term.  $\mu_i$  assumed to be random and independent of  $\varepsilon_{i,t}$ , and  $\mu_i \sim IID(0, \sigma_\mu^2)$  and  $\varepsilon_{i,t} \sim IIDv(0, \sigma_\varepsilon^2)$ .

Where (GDPpc  $i,t$ ) is gross domestic product divided by midyear population (current US\$). ATEP is an annual total energy production. Oil is oil rents as a percentage as GDP. (Petroleum  $i,t$ ) is petroleum production in Billion Barrels Per Year (BBY). (NR) are natural resources as a percentage of GDP. (DIV) is product concentration and diversification indices of exports and imports. IND is value-added per worker of industry. AGR is value-added per worker of agriculture. SER is value-added per worker of service.

The dependent variable is GDP per capita in current U.S. dollars, which is obtained from the World Bank's World Development Indicators. It was calculated by dividing GDP on total population when GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. However, we have rescaled it by dividing one thousand.

The main variables in the above regression are ATEP, oil rents, petroleum, and diversification. ATEP and petroleum variables have been collected from U.S. Energy Information Administration (EIA). Other indicators of natural resources, namely oil rents and natural resources, were collected from the World Bank's World Development Indicators. Oil rents are referred to as the difference between the value of natural gas production at world prices and total costs of production. Natural resources are a sum of oil rents, natural gas rents, coal, mineral, and forest rents.

Normally, literature which have studied natural resources subject, include other sectors like manufacturing sector, service sector, etc. However, because of lack of data in MENA region, our study involved three control variables, which are value added per worker {for Industry (IND), Agriculture (AGR), and Services (SER)}. They are measurement of labor productivity and value added per unit of input. Value added denotes the net output of a sector after adding up all outputs and subtracting intermediate inputs.

$$GDP_{i,t} = \beta_0 + \beta_2 ATEP + \beta_3 DIV + \beta_4 DIV \times ATEP + \beta_5 IND_{it} + \beta_6 AGR + \beta_7 SER + \mu_i + \varepsilon_{i,t} \dots (2)$$

Eq (2), the panel model is extended by adding interaction term, each time interacts with the diversification variable by different varieties of natural resources variables. ATEP x DIV is an interaction term between annual total energy production and diversification. DIV x OIL is an interaction term between oil rents and diversification. Petroleum x DIV is an interaction term between petroleum and diversification. NR x DIV is an interaction term between natural resources and diversification.

Another hypothesis, this study aim to test that the quality of institution is another scenario to slow economic performance in our sample economics. We however build econometric models, by adding interaction term between different variables of natural resources and

government effectiveness.  $ATEP \times GE$  is an interaction term between annual total energy production and government effectiveness.  $OIL \times GE$  is an interaction term between oil rents and government effectiveness.  $Petroleum \times GE$  is an interaction term between petroleum and government effectiveness.  $NR \times GE$  is an interaction term between natural resources and government effectiveness. We proceed with an estimate the following baseline FE model:

$$GDP_{i,t} = \beta_0 + \beta_1 ATEP + \beta_2 GE + \beta_3 (ATEP \times GE) + \beta_4 DIV + \beta_5 IND_{it} + \beta_6 AGR + \beta_7 SER + \mu_i + \varepsilon_{i,t}. \quad (3)$$

Where  $GE$  is government effectiveness, which is used to represent the vector of institutional variables in each country, these indicators range from -2.5 (bad) to 2.5 (good).

To robust check, we used various quality of institution indicator, which is regulatory quality. We proceed with an estimate the following baseline FE model:

$$GDP_{i,t} = \beta_0 + \beta_1 ATEP + \beta_2 GE + \beta_3 (ATEP \times GE) + \beta_4 DIV + \beta_5 IND_{it} + \beta_6 AGR + \beta_7 SER + \mu_i + \varepsilon_{i,t}. \quad (4)$$

Where  $RQ$  is regulatory quality, which is used to represent the vector of institutional variables in each country, this indicator ranges from -2.5 (bad) to 2.5 (good).

## 6. The Main Results

### 6.1. Summary of Main Variables

Table (1) presents summary of main variables in our study. GDP per capita has a mean value of US\$ 12837.84 and a maximum value US\$ 85076.15, reflecting that there are certainly large differences in GDP per capita between individual of Iraqi people, which is an inequality income that the theory of the “Dutch Disease” predicts. The income from oil and other natural resources produces negative economic consequence due to the workers leaving agriculture and manufacturing for higher-paying jobs in other non-tradeable sectors. Furthermore, the means of natural resources and oil rents are (19.5855) and (20.42665), and their maximum values (68.77825) and (67.5278) respectively, indicating that Iraq is heavily dependent on oil export revenues. For the diversification variable, the mean of it is (-180) and its maximum value (-25), reflecting that the economy of Iraq suffers from poor diversification because dependence on oil leaves no room for diversification. While  $COC$ ,  $GE$ ,  $PS$ ,  $QR$ ,  $ROL$ , and  $VA$  have mean values (-0.196, -0.204, -0.520, -0.219, -0.173, -0.840) respectively, reflecting that Iraq performs poorly in term of its intuitions. Transparency International corruption perception index (CPI) indicates that, in 2020, Iraq received a score of 21 of Anti-corruption, where 100 is a very clean country, and 0 indicates a very corrupt country (Transparency International, 2020). Thus, the high score of corruption indicates a positive relation between oil and corruption in Iraq (Naser, 2020).

What determines the degree to which natural resources can contribute to economic development is governance. Good governance – a strong public voice with accountability, high government effectiveness, good regulation, powerful anticorruption policies, and rule of law – tend to link natural resources with high economic growth. Botswana has benefited from the coexistence of good governance and abundant diamonds to materialize growth. No clear evidence can be found that deterioration in the terms of trade would negatively affect economic development, as the Dutch Disease model would hypothesize (Appiah and Zhang, 2013). Mehlum, Moene and Orvik (2011) stated that the main reason why Norway's natural resources have been a blessing rather than a curse found its explanation within the political system and in the political decisions.

Table (1): Summary of Main Variables (1995 -2018)

Variable	Obs	Mean	SD	Min	Max
GDP per cap (current US \$)	465	12837.84	15537.62	285.5696	85076.15
Natural Resources	419	19.58552	18.04544	.0008756	68.77825
Oil	373	20.42665	17.65118	.0004279	67.5278
petroleum	360	3.749981	5.366559	.005	25.497
DIV	499	-180.4629	57.58528	-259	-25
COC	420	-.1960102	.7621846	-1.663725	1.843301
GE	420	-.2046367	.8380949	-3.002496	1.509872
PS	420	-.5203223	1.073516	-3.180798	1.599426
RQ	420	-.2196329	.8641128	-2.274461	1.431291
ROL	420	-.1729901	.8156136	-2.278996	1.629644
VA	420	-.8408668	.7317774	-2.050344	1.372729
Services	328	21885.64	15856.29	1851.634	67908.26
Agriculture	364	13381.78	17100.43	836.858	94914.99
Industry	333	47611.61	54725.62	5625.111	214615.7

Table (2) reports the findings of the GMM model. For this purpose, we used four different types of natural resources variables, which are annual total energy production, oil rents, natural resources, and petroleum. All these variables indicate a robust positive association between oil rents and economic growth in Iraq. Our findings are consistent with the classical theory, which assumes that there is positive relationship between natural resources and economic growth. In fact, we tested also our findings by using the FE model to make sure the relation between our main variables was correct, whereby our findings approved our expectations. As result, we are strongly disagree with the resource curse hypothesis and the results reached by Sachs and Warner (1995) and confirmed by Sala-i- Martin (1997), such as natural resources having a negative effect on economic growth.

The coefficients of diversification and industry are negative and highly significant with unexpected signs. This can be explained by the fact that the oil sector leaves no room for investing in the other non-oil sectors. These findings have also been conceded by Matallah & Matallah (2016). In other words, we show that the positive association between resources and economic growth was unaffected by the inclusion of variables of non-oil sectors. Sachs and Warner (1997a, b) have mentioned that there is supportive evidence of natural resource abundant countries tendency to have a larger service sectors and smaller manufacturing sectors than resource-poor economies, our findings also support this conclusion. The Dutch Disease tends to reduce the level of total exports or divert the composition of exports away from those kinds of high-tech or high-value-added manufacturing and service exports that may be particularly good for growth over time. Our regression indicates a negative and significant effect at significance level (1%) of diversification on economic growth, since the negative coefficients indicate higher diversification (Osakwe, Santos-Paulino and Dogan, 2018).

## 6.2. Interaction Term of Diversification and Resources

In table (3), we turn on to the first contribution in this literature by adding new variables (DIV) and its interaction term with oil rents, for our regressions to test whether the (DIV) variable can help to promote economic growth in Iraq. In table (2), the diversification

variables are negative but not significant, an indication of Dutch Disease problem due to the resources sector, which frustrated diversification in Iraq. The resources sectors encourage seeking a piece of the resource pie instead of engaging in productive activities, and they are strong enough to keep the doors locked in front of diversification strategies (Matallah and Matallah, 2016). The resource variables are not anymore positives when (DIV) variable and its interaction term are included in the regressions. The interaction terms are also negative and highly significant. This is not consistent with hypothesis of economic diversification, which states that economic diversification contributes positively to economic performance. However, to test for marginal effect of resources on economic growth depends on diversification as follows:

$$\frac{d(\text{growth})}{d(\text{natural resources})} = -0.604 - 2.989(-180.5)(\text{mean of diversification}) = -64.5$$

$$\frac{d(\text{growth})}{d(\text{natural resources})} = -0.604 - 2.989(-25)(\text{maximum of diversification}) = -529.3$$

We see that the resource curse is weaker where there is a higher level of (DIV). The coefficients of oil rent, petroleum, and resources are (-106.5), (-1637.4), and (-79.98), but when we take the total effects of interaction terms, the coefficients become positives (-106.5 + 290.79 = 184.3 > -106.5), (-1637.4 + 2274.3 = 636.9 > -1637.4), and (-79.98 + 254.325 = 174.345 > -79.98). Statistically, we can observe that (DIV) can help to avoid the Dutch Disease problem. The total effect of interaction terms (ATEP x DIV), (Oil x DIV), (Petroleum x DIV), and (Resources x DIV) are that the resource curse is (-64.5, 112.9, -29.49, 110.15) with mean value of diversification and it is (-529.3, -56.5, -186.6, -43.3) with maximum value, respectively.

### 6.3. The Interaction Term of Government Effectiveness and Resources.

To test for our hypotheses, which is the resources curse in Iraq is not only a consequence of the Dutch disease story but also comes from poor institutional quality. We then assumed that a good enough quality of institution may help to avoid resource curse. We, however, used government effectiveness as a proxy for quality of institution. Our findings indicate that not only all types of natural resources variables (ATEP, Oil, Petroleum, resources) are highly significant, but also interaction terms variables are significant. At first sight, it seemed there was no problem with quality of institution, but when we tested for the total effect, we found that the poor quality of institutions slow economic growth while good institutions accelerate economic growth. The marginal effect of resources on economic growth depends on quality of institutions as follows:

$$\frac{d(\text{growth})}{d(\text{natural resources})} = 726 + 213.7(-0.204)(\text{mean of GE}) = 682.4$$

$$\frac{d(\text{growth})}{d(\text{natural resources})} = 726 + 213.7(1.51)(\text{maximum of GE}) = 1049$$

The total effect of interaction terms (ATEP x GE), (Oil x GE), (Petroleum x GE), and (Resources x GE) are (682.4, 234.3, 1136.7, 220) with mean value of government effectiveness respectively. The total effect of interaction terms (ATEP x GE), (Oil x GE), (Petroleum x GE), and (Resources x GE) are (1049, 806.3, 1880, 750) with maximum value, respectively. However, the findings confirm our hypothesis that bad institutions slow economic growth and good institutions accelerate economic growth.

### 6.4. Robustness Check

#### 6.4.1. The Interaction Term of Regulation Quality and Resources.

Table (6) presents another interaction term of an institution, which is regulation quality with various types of resources, whereby all interaction terms were found significant. Also, all types of resources have remained highly significant in regressions. The findings have also confirmed our hypothesis that a bad institution slows economic growth and good institutions accelerate economic growth. The total effect of interaction terms (ATEP x RQ), (Oil x RQ), (Petroleum x RQ), and (Resources x RQ) are (626.3, 226.3, 1034.2, 216) with a mean value of regulation quality, respectively. The total effect of interaction terms (ATEP x RQ), (Oil x RQ), (Petroleum x RQ), and (Resources x RQ) are (648.7, 586.5, 1814.1, 501.7) with maximum value of regulation quality, respective.

### 7. Conclusion and Discussion

We examined how natural resource, (DIV), and the (QI) influence economic growth in (17) countries using panel data estimator over the period 1995-2018. We have used this data as proxy of Iraq's data because these countries have similar economic situation. We have hypothesized that the (QI) essentially determines whether natural resource abundance is a blessing or a curse. We used governance institutions to test our hypothesis. Good institutions can achieve superior results in economic growth in Iraq. Our findings support our hypothesis that bad institutions slow down economic growth, and the Dutch Disease phenomenon is confirmed in the economy. The theory of "Dutch Disease" predicts that oil produce negative economic growth consequences through several channels. **First**, inequality income in Iraq, making workers leave from agriculture and manufacturing sectors due to low paying and move to energy sectors due to higher-paying, which confirms one of oil curses hypothesis. In other words, the employees of other sectors envy oil sector's employees on the payments they receive. As a result, the production of whole economic growth in Iraq is reduced. **Second**, our findings show that the productivity of non-natural resources sectors is negative and significant because of both phenomena of rent-seeking and the Dutch Disease, which is another finding that confirms the oil curse in Iraq. However, these are not a unique feature of resource economies, but they do appear to have particularly strong effect on them and to produce institutional weaknesses.

We report that while resource-rich countries have maintained high levels of income per capita, they have performed poorly when going beyond the assessment based on standard income level measures. They have experienced relatively low and non-inclusive economic growth, as well as high levels of macroeconomic volatility. The quality of the provision of public goods and services remains an important source of concerns. Looking forward, we argue that the success of economic reforms in Iraq rests on the ability of Iraq to invest boldly in building appropriate and strong institutions. **On the other hand**, we have argued that diversification is helpful for economic growth and reduces the risk of experiencing the oil curse. **Furthermore**, our study also reached other conclusions such as natural resources themselves are the root of the problems facing many oil-exporting economies in short run, but the weakness of institutions in Iraq is the problem, but with better institutions, real per capita income will be higher. For instance, there are five oil exporters who witnessed positive GDP growth during the oil price collapse in the 1980s. These countries are Oman, Indonesia, Norway, Malaysia, and Canada. These examples demonstrate that strong economic institutions can help weather the storm of low commodity prices. Therefore, the Iraqi government should undertake measures to learn from countries like Norway and Botswana that have been able to turn their natural resource reserves into a blessing.

However, these lessons should not be copied blindly but should be adapted to the needs of local communities and of the nation in general. It is only by doing so that economic development and political stability can be ensured.

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## Annex: Table 2-6

**Table(2): The Partial Association between Divarication and Different Resources Variables on Per Capita GDP**

Description Variables	(1)"GMM"	(2)"GMM"	(3)"GMM"	(4)"GMM"
DIV	-0.0563** (-3.14)	-0.0612***(-3.96)	-0.0764***(-4.44)	-0.0597***(-4.41)
Industry	-0.0781*** (-4.39)	-0.134*** (-8.59)	-0.0765*** (-4.18)	-0.132*** (-8.84)
Service	0.0510 (0.83)	0.185** (3.29)	(0.90)0.0560	0.180*** (3.38)
Agriculture	0.329*** (9.97)	0.324*** (10.09)	(9.96)0.330***	(10.46) 0.321***
ATEP	0.661*** (4.52)			
Oil		(6.79) 0.176***		
Petroleum			(4.24)1.057***	
Resources				0.172*** (7.12)
N	267	255	267	278

t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. GDP Per Capita (Thousand US\$)

**Table (3): The Effect of Interaction Term between Divarication and Different Resources Variables on Per Capita GDP**

Description Variables	(1)""FE	(2)""FE	(3)""FE	(4)""FE
DIV	-0.0624**(-2.87)	-0.0239(-1.38)	-0.0501**(-2.70)	-0.0301*(-2.00)
Industry	-0.0804***(-4.37)	-0.143***(-9.39)	-0.0490*(-2.48)	-0.138***(-9.46)
Service	0.0556(0.89)	0.222***(4.04)	-0.00571(-0.09)	0.208***(3.97)
Agriculture	0.329***(9.96)	0.321***(10.38)	0.325***(10.00)	0.317***(10.63)
ATEP	0.957(1.56)			
ATEPxDIV	0.00125(0.50)			
Oil		-0.106(-1.52)		
OilxDIV		-0.00161***(-4.32)		
Petroleum			-1.637(-1.95)	
PetroleumxDIV			-0.0126***(-3.35)	
Resources				-0.0800(-1.21)
ResourcesxDIV				-0.00141***(-4.07)
N	267	255	267	278

t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table (4): The Effect of Interaction Term between Gov,t Effectiveness and Different resources on Per Capita GDP**

Description Variables	(1)""FE	(2)""FE	(3)""FE	(4)""FE
GE	-1.007(-1.14)	0.472(0.60)	-1.200(-1.39)	0.227(0.30)
DIV	-0.0606**(-2.78)	-0.0714***(-4.49)	-0.0876***(-4.17)	-0.0682***(-4.69)
Industry	-0.0505*(-2.47)	-0.0970***(-6.19)	-0.0348(-1.57)	-0.0960***(-6.29)
Service	0.0457(0.66)	0.220*** (4.12)	-0.00607(-0.08)	0.215*** (4.18)
Agriculture	0.326*** (7.91)	0.328*** (9.51)	0.332*** (8.06)	0.323*** (9.63)
ATEP	0.727*** (4.41)			
ATEPxGE	0.214* (2.38)			
Oil		0.302*** (10.16)		
OilXGE		0.334*** (9.36)		
Petroleum			1.225*** (4.41)	
PetroleumXGE			0.433** (3.11)	
Resources				0.283*** (10.22)
ResourcesXGE				0.309*** (9.25)
N	235	223	235	242

t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table (5): The Effect of Interaction Term between Regularity Quality and Different resources on Per Capita GDP**

Description Variables	(1)""FE	(2)""FE	(3)""FE	(4)""FE
RQ	1.702(1.26)	-1.148(-1.21)	0.293(0.23)	-1.271(-1.40)
DIV	-0.0619**(-2.86)	-0.0642***(-3.69)	-0.0827***(-4.01)	-0.0627***(-4.02)
Industry	-0.0682***(-3.37)	-0.141***(-8.44)	-0.0453*(-2.01)	-0.139***(-8.63)
Service	0.0834(1.22)	0.237*** (3.98)	0.0441(0.62)	0.237*** (4.17)
Agriculture	0.323*** (7.75)	0.329*** (8.70)	0.316*** (7.60)	0.328*** (8.98)
ATEP	0.629*** (3.79)			
ATEPxRQ	0.0135(0.12)			
Oil		0.274*** (8.29)		
OilXRQ		0.218*** (5.85)		
Petroleum			1.138*** (4.01)	
PetroleumXRQ			0.472* (2.18)	
Resources				0.260*** (8.48)
ResourcesXRQ				0.198*** (5.82)
N	235	223	235	242

t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table (6): The Effect of Interaction Term between Rule of Law and Different resources on Per Capita GDP**

Description Variables	(1)""FE	(2)""FE	(3)""FE	(4)""FE
ROL	3.180*(2.11)	-1.259(-1.07)	0.380(0.28)	-1.614(-1.53)
DIV	-0.0789***(-3.53)	-0.0445**(-2.69)	-0.105***(-5.01)	-0.0427**(-2.83)
Industry	-0.0718***(-3.63)	-0.146***(-9.29)	-0.0281(-1.26)	-0.143***(-9.46)
Service	0.0988(1.45)	0.244***(4.38)	0.000566(0.01)	0.238***(4.48)
Agriculture	0.323***(7.87)	0.330***(9.32)	0.323***(8.07)	0.326***(9.55)
ATEP	0.580***(3.50)			
ATEPx ROL	0.00269(0.02)			
Oil		0.303***(9.98)		
OilX ROL		0.228***(8.05)		
Petroleum			1.383***(4.60)	
PetroleumX ROL			0.976***(3.94)	
Resources				0.289***(10.36)
ResourcesX ROL				0.220***(8.27)
N	235	223	235	242

t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

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