Analysis of the Relationship between Total Natural Resources Rent and Economic Growth: The Case of Iran and MENA Countries

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Abstract
In this paper, we examine the relationship between economic growth and total natural resources rent for the Iran and MENA economies by using annual data set over the period of 1970-2012. Many developing countries are heavily dependent on primary products as their main source of export revenues. The natural resources, especially oil, play an important role in the economy of developing countries and it is important to show how natural resources may affect long run economic growth and the channel which the relationship is based upon. Indeed, the oil and gas industry has been the engine of economic growth, directly affecting public development projects, the government’s annual budget, and most foreign exchange sources.

In this paper, we provide GDP per capita, growth rate and total natural resources rent (%GDP), rate for Iran and MENA countries during the periods of 1970-2012. The data show that for 1986, the total natural resources rents (%GDP) growth rate is 1.56 and GDP per capita growth rate is -0.36. It seems "resource curse" has happened in these years. Also, we found the same result for the MENA countries in periods of 1979 and 2008. By using ordinary least squares, we have discussed the relationship between the variables mentioned.

JEL classifications: O4, Q3, O13, N15
Keywords: Economic growth, Oil, Resource curse, MENA countries

1. Introduction
About 3.5 billion people live in countries rich in oil, gas or minerals. Many of these countries suffer from poverty, corruption and conflict stemming from weak governance. Too often, mineral, oil and gas resources have become a source of conflict rather than opportunity. Non-renewable mineral resources play a dominant role in 81 countries, collectively accounting for quarter of world GDP, half of world population and nearly 70% of those in extreme poverty. Oil is a non-renewable and strategic commodity, vital to the growth of all economies. Many developing countries are dependent on exports of raw materials as a source of income. (Brandon J. Sheridan, (2014)). Oil revenues have an important role in the Iranians economy. Expect oil prices a direct effect to domestic investment in the petroleum sector in the first and second round increase input demand for the other sectors. (Benedictow Andreas, Fjartoft Daniel, Lofsnæs Ole, (2013)). Moreover, from the demand side point of view, Oil relative to other commodities, will have a greater impact on the global economy and the recession may be more. Researcher have not only explored the crude oil market alone, but also examined the impact of oil price changes on economic growth and the relationship between the oil market and other markets. (Ma. F, Wei. Y, D.S. Huang, et al (2013), Vigfusson R.J, (2011), Kilian L, (2008), Ma Feng, Zhang Qian, Chen Peng, Wei Yu, (2014)).

Maybe at first seems it is true that a lot of revenue from natural resources to create wealth and economic development. However, this view is based on the theory of economic development, can be correct. Because in the issues of development, underdevelopment countries to low investment levels have been linked. But, empirical evidence does not confirm it. If natural resources help to economic growth and development, why today we don’t see a positive correlation between natural wealth and other types of economic wealth? The relationship between economic growth and natural resources for more than two decades that has attracted the attention of researchers. While one group of economists claim that natural resource abundance leads to economic growth, the other group of scholars advocate that there is a negative relationship between resource abundance and economic growth. (Kumar Sahoo Auro, Dukhabandhu Sahoo, Chandra Sahu Naresh, (2014)). The first body of the literature establishes a negative relationship between resource abundance and poor economic performance. (Auty (2001)). The results appear to support the “resource curse” hypothesis. There is vast theoretical and empirical literature that focuses on the curse of natural. Economies that are richly endowed with natural resources tend to grow slowly. Several causes have been suggested for this “curse of natural resources” such as the Dutch disease, deficiencies in institutions, rent-seeking, neglect to invest in human capital. (Mehrara Mohsen, Kikha Alireza, (2007)).
All these hypotheses assume that oil rents have a negative effect on non-oil sector performance. (Agnani Betty, Iza Amaia, (2009)). Auty (2001), found that per capita income of resource poor countries grew between two to three times faster than that of the resource-abundant countries for the period 1960–1990. This so-called “resource curse” has inspired many economists to explain its origins. (Hamdi Helmi, Sbia Rashid, (2013)). Generally It show that countries that are rich in natural resources compared to countries that are poor in natural resources, often have lower economic growth. The relationship between natural resource abundance and economic growth is controversial among scholars. (I.Ster David, 2003).

2. Theoretical framework

Until the mid-1980s, countries have experienced increases in oil prices and economists generally used symmetrical patterns to explain the relationship between oil and macroeconomic variables. In this model, the effect of oil prices on macroeconomic variables, assumed to be symmetrical and identical, But in 1986, with the decline in oil prices, the use of symmetrical patterns was being questioned. In fact, the decline in oil prices, rise of economic growth could not be predicted based on the former symmetrical patterns for industrial countries. Since the industrial oil-importing countries were more dependent on the oil, they suffered losses. Experimental results obtained from oil-exporting countries, shows that the decrease in oil prices, is the main cause of recession in these countries. While rise in oil prices less important role in the economic development of this country. Therefore oil price change have asymmetric effect in oil export country. In other words, the negative effects of decrease in oil prices in these countries is greater than the positive effect of higher oil prices. The negative impact of oil shocks on economic growth in the long term, more than positive effects on economic growth in these countries. To explain the asymmetric effects of oil prices on oil-exporting countries, higher oil prices lead to increased foreign exchange earnings and government spending. But if government spending and expansionary policies led out private investment, the positive impact of government spending will be reduced. (Molayi Mohammad, Golkhandan Abolgasem, Golkhandan davod, (2013)).

Iran is the second largest economy in the Middle East and North Africa (MENA) region after Saudi Arabia, with an estimated Gross Domestic Product (GDP) of dollars 368.9 billion in 2013-2014. (World Bank). Its economy is characterized by a large hydrocarbon sector, small scale agriculture and services sectors, and a noticeable state presence in manufacturing and financial services. One of the most important resources national wealth in the world is natural resources. Iran ranks second in the world in natural gas reserves and fourth in proven crude oil reserves.

Many oil economy countries like Iran, relies on oil and gas exports. Of course, Iran is an energy superpower and the Petroleum industry in Iran plays an important part in it. Indeed, the oil and gas industry has been the engine of economic growth, directly affecting public development projects, the government’s annual budget, and most foreign exchange sources. Iran's first oil well, was discovered in 1908 in the city of Masjed Soleiman with oil production flowing in sizeable amounts from 1912. Even after 100 years of exploration and production, Iran’s current estimated reserve-to_EXTRACTION ratio suggests a further 87 years of oil production even in the absence of new oil field discoveries or major advances in oil exploration and extraction technologies. If oil revenue is managed well, could lead to increased employment, but there is a risk of oil to the size of the benefit. (Gylfason Thorvaldur, (2001)).

A causal relation between economic growth and oil is positive and significant. Since exports are a component of GDP, increasing exports necessarily increases GDP, ceteris paribus. (J. Sheridan Brandon, (2014)).

In Figure 1, by using data from the World Bank, the total natural resources rent\(^1\), (%GDP) growth rate and GDP per capita growth rate for Iran in period of 1970-2012 is plotted. In period of 1986, the total natural resources rents (%GDP), is 1.56 and GDP per capita, is -0.36. Therefore, GDP per capita, growth rate less than total natural resources rent (%GDP) growth rate and for periods of 1992 and 2000 we can conclude same the result. It seems "resource curse" has happened in these years. Although total natural resources rent (%GDP), growth rate was high, but economic growth rate has been low. Also total natural resources rent (%GDP), growth rate for all periods of 1970-2012, is -1.6 percent whiles GDP per capita, average growth rate has been 5.5 percent.

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\(^1\) Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.
In the figure 2, we provide GDP per capita, growth rate and total natural resources rent (%GDP), growth rate for MENA countries in periods of 1970-2012. The data is extracted from the World Bank. Figure 2, reports annual changes in per capita GDP and total natural resources rent (%GDP) growth rate for the Middle East and North Africa countries (MENA) in the sample that include exporter oil countries. In Figure 2, 0.26 percent GDP per capita, growth rate in 1979, while total natural resources rent (%GDP), growth rate was 35. In the period of 2008, GDP per capita, growth rate decrease much more than total natural resources rent (%GDP) growth rate For the MENA countries. Natural resources seem to have been more of a curse than a blessing for many countries. (N. Brunnschweiler Christa, (2007), Sachs Jerey D, Warner Andrew M, (2000)).

Oil not only affects the economic growth but also affects other sectors of economy. Pasban (2004), to study the effect of oil price fluctuations, concludes that the impact of rising oil prices and increased oil revenues, reduced agricultural production. Mehrara and Niki oskuyi (2005), to identify structural shocks four countries showed that Oil shocks are the most important factor.

One another interpretation of the resource curse hypothesis, the Dutch Disease that occurs in oil-exporting countries. Netherlands recession after the discovery of sea oil in 1970, the so-called Dutch disease was common that the economy is divided into three parts: a tradable natural resource sector, a tradable (non-resource) sector, and a non-traded sector. (C.Stijns Jean-Philippe, (2005)). According to the Dutch disease, when oil revenues increased, the value of the domestic currency will increase and this leads to the non-tradable goods sector increases.
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Therefore relative efficiency of non-tradable relative to tradable sector increase. Eventually reduced economic growth will happen (Mehrara Mohsen, Abrishami Hamid, Zamanzadeh Nasr Abadi Hamid, (2001)).

3. Methodology and Data

As mentioned in the introduction, the main object of this study is to investigate the relationship between total natural resources rent (%GDP) and economic growth in Iran and MENA countries by using time series from 1970-2012. In this research, we used the real GDP per capita and total natural resources rent (%GDP). The resource of the data is World Bank. All the estimation and test are conducted using E-views 8 software. The starting premise is that total natural resources rent are directly related to economic growth.

The multiple linear regression model is used to study the relationship between a dependent variable and one or more independent variables. In this paper, we have estimated the following relationship:

\[ \text{GDP per capita} = C + \text{Total Natural resources rent} \times \% \text{GDP} + U \]  

Where GDP per capita is the dependent or explained variable and total natural resources rent is the independent or explanatory variable. The term U is a random disturbance, so named because it “disturbs” an otherwise stable relationship. Since we cannot hope to capture every influence on an economic model, we used it.

Table 1: OLS estimation results for the Iran country.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.0238013</td>
<td>0.024454</td>
<td>9.733038</td>
</tr>
<tr>
<td>Total natural resources rent</td>
<td>0.303366</td>
<td>0.047639</td>
<td>6.368029</td>
</tr>
</tbody>
</table>

Breusch-Godfrey Serial Correlation LM Test:

F-statistic 2.175972 Obs*R-squared 4.651515

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic 2.918751 Obs*R-squared 2.854780

Other tests:

R-squared 0.600307 Durbin-Watson stat 2.0131798
Table 2: OLS estimation results for the MENA countries.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total natural resources rent (%GDP)</td>
<td>13.65378</td>
<td>4.915226</td>
<td>2.777853</td>
</tr>
<tr>
<td>C</td>
<td>898.3428</td>
<td>377.8980</td>
<td>2.377209</td>
</tr>
<tr>
<td>AR(1)</td>
<td>1.832730</td>
<td>0.1162661</td>
<td>15.76387</td>
</tr>
<tr>
<td>AR(2)</td>
<td>-0.804097</td>
<td>0.57162</td>
<td>-6.181204</td>
</tr>
</tbody>
</table>

Breusch-Godfrey Serial Correlation LM Test:

F-statistic 0.8853 Obs*R-squared 1

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic 1.714115 Obs*R-squared 0.1889

Other tests:

R-squared 0.993920 Durbin-Watson stat 1.972182

To analyze the relationship between the two variables mentioned, we used estimates ordinary least squared (OLS) method and the following results have been achieved:

According to Table 1 for Iran country, total natural resources rent impact on GDP per capita, ceteris paribus. Total natural resources rent (%GDP) coefficient is 0.3 and this means that if a unit percent of total natural resources rent (%GDP) increased GDP per capita will increase 0.3 percent. Therefore in general, for the Iran economy can be concluded that total natural resources rent affect economic growth. Other estimates, such as the F-statistic and Durbin-Watson stat, can be seen in the table 1.

According to Table 2 for MENA countries, total natural resource rent coefficient is 13.65 and with one percentage increase in total resources rent, GDP per capita 13.65 percent increase. For MENA countries, the total natural resources rent impact on GDP per capita is significant.

These results imply that, resource curse has happened for some years, but in general, natural resources rent affect economic growth and we can confirm the hypothesis of the research that has indicated that there is a direct relationship between the two variables mentioned.

4. Conclusion

The purpose of this study was to analyze the relation between total natural resources rent and economic growth. For Iran over the period 1970-2012. Many developing countries are heavily dependent on Primary products as their main source of export income. Oil revenues have an important role in the Iranians economy. Iran is an energy superpower and the Petroleum industry in Iran plays an important part in it, but oil brings risks as well as benefits. by using updated data from the World Bank, the total natural resources rent, (%GDP), growth rate and GDP per capita, growth rate for Iran and MENA countries in period of 1970-2012 is plotted. Also total natural resources rent (%GDP), growth rate for Iran over all periods of 1970-2012, is -1.6 percent whiles GDP per capita, a growth rate has been 5.5 percent. We conclude that, for the some years studied resource curse may have happened.

To measure the impact total natural resources on economic growth, we used ordinary least square (OLS). Result showed that for MENA and Iran countries, total natural resources will impact on economic growth. We find that the coefficient of total natural resources rent for MENA countries have been 13.65 and it have been a significant effect on economic growth in MENA countries. For Iran we find 0.3 coefficient of total resources and this means that, total natural resources rent impact on economic growth but its effect is not significant. In generally, although resource curse happened in some years for MENA and Iran countries, but in overall, total natural resources rent have been impact on economic growth. We can confirm the hypothesis of the research that has indicated that there is a direct relationship between the two variables mentioned.
References

1) Auro Sahoo Dukhabandhu, Kumar Sahoo, Chandra Sahu Naresh, (2014), Mining export, industrial production and economic growth: A cointegration and causality analysis for India. Resources Policy, No. 42, PP 27-34.


