**Asian Economic and Financial Review**
*ISSN(e): 2222-6737*
*ISSN(p): 2305-2147*
*DOI: 10.18488/journal.aefr.2017.710.952.958*
*Vol. 7, No. 10, 952-958*

*URL: www.aessweb.com*

# NATURAL RESOURCE RENTS AND UNEMPLOYMENT IN OIL EXPORTING COUNTRIES

**Engy Raouf Abdel Fattah**[1]

[1]*Assistant Professor, Department of Economics and Foreign Trade Faculty of Commerce and Business Administration, Helwan University, Egypt*

**Article History**
Received: 30 May 2017
Revised: 24 July 2017
Accepted: 3 August 2017
Published: 15 August 2017

**Keywords:**
Natural resource rents
unemployment
Oil exporting countries PMG-ARDL
Dutch disease
Causality test.

***ABSTRACT***

The main objective of this study is to examine short-run and long-run relationship between natural resource rents and unemployment in OPEC and OAPEC countries over the period from 1991 to 2016, using PMG-ARDL model. The causality test shows that causality runs from total natural resources rents to unemployment. The study finds that, on the long-run, the impact of natural resource rents on unemployment rate is a positive significant impact, whether using aggregated data for natural resource rents or disaggregated (oil and natural gas). Almost all the variables have no significant impact on unemployment on the short-run.

**Contribution/ Originality:** This study contributes in the existing literature by investigating the impact of natural resource rents on unemployment. This study is one of very few studies which have disaggregated natural resources and studying the effect of each one of the components of natural resources not only the aggregate level.

## 1. INTRODUCTION

Previous studies focused mainly on the impact of natural resource rents on economic growth. In this paper, I will study the impact of natural resource rents on unemployment in a number of oil exporting countries. This study is concerned with answering one main question which is to what extent natural resource rents will affect unemployment level in an economy. Countries with abundant natural resource must try to manage their rents in an effective way in order to avoid the resource curse. Resource curse hypothesis and it is impact on the economy can be explained by many factors (Ouoba, 2016).

There are two points of view concerning the impact of natural resource rents on growth and employment as well. An increase in resource rents leads to higher government spending on non-tradable sector, consequently, resources will be shifted away from the tradable sector to the non-tradable sector. As a result, the economy witnesses a de-industrialization, unemployment will rise, and output will fall; this is known as 'Dutch Disease' (Omojolaibi and Egwaikhide, 2014).

From another point of view, the "resource reallocation effect" which is the movement towards the resources sector and away from other sectors in the economy, will create new jobs in the natural resource sector and hence reduce unemployment. Furthermore, the sector of natural resource will attract foreign direct investment, this potential growth in investments could stimulate the economy, enlarge employment and boost growth. At the same time, a boom in natural resource rents leads to an increase in total employment and income as when demand for natural resources increase, wages and number of jobs will increase as well (Dartey-Baah *et al*., 2012; Weber, 2012).

## 2. DUTCH DISEASE

The term Dutch disease was introduced in 1960s when natural gas was discovered in Netherlands and this discovery leads to a decline in the manufacturing sector. Dutch disease stimulates "spending effect" and "resource pull effect". Natural resource revenues can be used to support internationally traded goods rather than domestic goods, this is known as spending effect". The second effect, "resource pull effect", involves the shift of factors of production towards the natural resource sector. As a result, the economy will be directed towards services sector instead of manufacturing sector. Similarly, factors of production and labor are going to transformed to the non-tradable sector, and hence cost of production in the traditional tradable sector will increase. As a result, unemployment increases in the manufacturing sector (Dartey-Baah *et al*., 2012; Gerelmaa and Kotani, 2016).

Another point of view regarding Dutch disease or the negative impact of natural gas discoveries is the negative impact on investment in other sectors. The economy depends mainly on natural capital, as a result natural capital crowds out other types of capital. These leads to a reduction in savings and investments in human capital and other sectors in the economy. This means that resource revenues shifts productive entrepreneurs to rent seeking (Ahmed *et al*., 2016).

## 3. LITERATURE REVIEW

Previous studies are highly concerned with studying the impact of natural resources on economic growth of the country giving little concern to other factors.

Sachs and Wrner (1995) studied the relationship between natural resources and economic growth in 97 developing countries. They found that resource abundance affects economic growth negatively, as limited resources' countries achieve a higher growth rate compared to resource –rich countries.

Mehlum *et al.* (2006) identified the reasons behind the differences in the impact of resource abundance on economic growth between countries. They claim that the chief reason for these is the differences in the quality of institutions. As a result, countries with sufficient quality of institutions natural resources can foster long-term development.

James and Aadland (2011) examined the impact of natural resource dependence on economic growth. This study contributed to literature by examining resource curse hypothesis at a more disaggregated county level. They find resource-dependent countries depicted weaker economic growth.

Mavrotas *et al.* (2011) examine the relationship between natural resource dependence and growth in developing countries. They differentiate between the different types of natural resources. They found that flow of revenue from natural resources such as oil are concentrated, while flows from agriculture resources are more diffused. The study shows that mineral resource abundance did not prevent economic growth. They distinguish between resource dependence and resource abundance and it was found that resource dependence has no significant impact on growth.

Gross (2012) estimated the impact of energy consumption on economic growth using ARDL model using a sectoral data. By conducting Granger causality test, it was found that in the commercial sector, there is a unidirectional long-run causality from growth to energy, while in the transport sector, there is a bi-directional long-run Granger causality.

Eregha and Mesagan (2016) studied the effect of different institutional quality measures and oil-resource abundance on economic growth in order to determine whether good institutions can decrease resource curse impact or not in African oil rich countries. The study showed that institutional quality enhanced per-capita income growth but it was insignificant. The interaction variables were negative and significant referring to the fact that institutions quality would not be able to lessen the resource curse in these countries. It is recommended to reinforce the quality of the institutions to sustain growth.

Ahmed *et al.* (2016) discuss the resource curse hypothesis in Iraq using the time-series data over the period of 1965–2011. Economic growth has been estimated as a Cobb Douglas production function which includes natural resources, exports, capital and labor. The cointegration test shows that the variables under consideration are cointegrated, while long run analysis of the results validate the resource curse hypothesis and incorporates that natural resource hinder economic growth in Iran.

Badeeb *et al.* (2017) identified the mechanisms through which resource revenue hinder economic growth. They analyzed a number of previous studies that show that resource curse reveals only empirical misspecification. They found also other recent surveys that have contradictory results. They concluded that the negative effect of resource dependence on growth remains convincing.

A review of empirical studies shows how natural resources affect economic growth in different countries or using different commodities, different locations and time horizon. This paper extended the analysis to study the impact of natural resource rents on employment.

## 4. DATA

This study adopted a panel data approach covering data for OPEC and OAPEC countries over the period from 1991 to 2016. The variables included in this study are GDP growth rate (GDPG), unemployment rate (UNEM), natural resource rents (TNATURAL), gross capital formation (GCF), natural gas rents (NATURAL) and petroleum rents (OIL). The data for all variables are gathered from the World Bank database.

## 5. METHODOLOGY

The main objective of this study is to examine the relationship between natural resource rents and unemployment in OPEC and OAPEC countries over the period from 1991 to 2016. A PMG –ARDL estimation has been employed in order to estimate both long- and short-run relationship in this study. The ARDL model is preferred because it is applicable regardless of the stationarity level, in addition it can be employed in case of small samples (Badeeb *et al.*, 2017).

$$\Delta y_{it} = \emptyset_i\left(y_{i,t-1} - \beta_i x_{i,t-1}\right) + \sum_{j=1}^{p=1} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q=1} y_{i,j} x_{i,t-j} + \mu_i + u_{it}$$

Where $y_{it}$ represents the dependent variable (unemployment), $x_{it}$denotes a vector of regressors, $\mu_i$ represents fixed effects, $\emptyset_i\ is$ a scalar coefficient on the lagged dependent variable, $\beta_t$ is the k x 1 vector of coefficients on explanatory variables, $\lambda_{ij}$ are scalar coefficients on lagged first-differences of dependent variables, and $y_{i,j}$ are vectors of coefficients on first-difference of explanatory variables and their lagged values (Badeeb *et al.*, 2017).

## 6. RESULTS

### 6.1. Causality Test

First of all, a Panel causality test has been implemented in order to test the direction of causality between unemployment rate and natural resource rents. The panel causality test tests the null hypothesis of no causal relationship for any of the cross-section units, against the alternative hypothesis that causal relationships occur for at least one subgroup of the panel (Antonakakis *et al*., 2017).

**Table-1.** Pairwise Dumitrescu Hurlin Panel Causality Tests for Aggregated Natural Resources Rents

| Null Hypothesis: | W-Stat. | Zbar-Stat. | Prob. |
|---|---|---|---|
| Total natural resource rents do not homogeneously cause unemployment | 10.3800 | 2.34732 | 0.0189 |
| Unemployment does not homogeneously cause total natural resource rents | 6.76187 | 0.19799 | 0.8431 |

**Source:** Developed by the author using E-views

The causality test in table 1 shows that there is a unidirectional causality relationship between unemployment and aggregated natural resource rents, from aggregated natural resource rents to unemployment.

**Table-2.** Pairwise Dumitrescu Hurlin Panel Causality Tests for Disaggregated Natural Resource Rents

| Null Hypothesis: | W-Stat. | Zbar-Stat. | Prob. |
|---|---|---|---|
| Natural gas rents does not homogeneously cause unemployment | 5.33461 | 2.05604 | 0.0398 |
| Unemployment does not homogeneously cause natural gas rents | 5.21041 | 1.91971 | 0.0549 |
| Oil rents does not homogeneously cause unemployment | 5.45963 | 2.19327 | 0.0283 |
| Unemployment does not homogeneously cause oil rents | 5.13184 | 1.83346 | 0.0667 |

**Source:** Developed by the author using E-views

After repeating the causality test using a disaggregated natural resource rents data, as shown in table 2, it can be concluded that there are two-ways causality relationships between unemployment and natural gas rents and oil rents. These causality relationships are from oil rents and natural gas rents to unemployment, at a significant level 5%. While causality relationships are from unemployment to natural gas rents and oil rents, at a significant level 10%.

### 6.2. Pooled Mean Group- Autoregressive Distributed Lag model

PMG-ARDL model will be estimated on an aggregated and disaggregated level. The first one will examine the relationship between natural resource rents, gross capital formation, GDP growth rate and unemployment rate.

The PMG-ARDL (4,4,4,4) shows the long-run and short-run coefficients between unemployment and natural resources. In the long-run, it can be concluded from the results that natural resource rents have a positive impact on unemployment rate. GDP growth rate affects unemployment negatively. Gross capital formation has a positive relationship with unemployment which means that capital is a substitute for labor. In the short-run, almost all variables are not statistically significance in influencing unemployment rate.

Now the model will be re-estimated in order to disaggregate the components of natural resources. After re-estimating the PMG-ARDL (3,3,3,3) model using a disaggregated natural resources data where oil rents and natural gas rents are included as explanatory variables (note: natural resources have other components but their values are zero in many years) in addition to GDP growth rate and gross capital formation.

**Table-3.** PMG-ARDL estimation for aggregated natural resource data

| **Dependent Variable: D(UNEM)** | | | | |
|---|---|---|---|---|
| Method: ARDL | | | | |
| Included observations: 294 | | | | |
| Selected Model: ARDL(4, 4, 4, 4) | | | | |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.*** |
| | Long Run Equation | | | |
| TNATURAL | 0.046919 | 0.003641 | 12.88617 | 0.0000 |
| GDPG | -0.073948 | 0.009070 | -8.152951 | 0.0000 |
| GCF | 0.073930 | 0.013598 | 5.436853 | 0.0000 |
| | Short Run Equation | | | |
| COINTEQ01 | -0.254665 | 0.150916 | -1.687461 | 0.0944 |
| D(UNEM(-1)) | 0.119932 | 0.302004 | 0.397120 | 0.6921 |
| D(UNEM(-2)) | 0.161945 | 0.232666 | 0.696042 | 0.4879 |
| D(UNEM(-3)) | 0.145887 | 0.247497 | 0.589449 | 0.5568 |
| D(TNATURAL) | -0.080724 | 0.054613 | -1.478116 | 0.1423 |
| D(TNATURAL(-1)) | 0.039669 | 0.036018 | 1.101347 | 0.2732 |
| D(TNATURAL(-2)) | -0.019071 | 0.041890 | -0.455263 | 0.6498 |
| D(TNATURAL(-3)) | 0.038411 | 0.048509 | 0.791831 | 0.4302 |
| D(GDPG) | -0.057743 | 0.085225 | -0.677532 | 0.4995 |
| D(GDPG(-1)) | -0.093092 | 0.045821 | -2.031641 | 0.0446 |
| D(GDPG(-2)) | -0.003737 | 0.054870 | -0.068115 | 0.9458 |
| D(GDPG(-3)) | -0.051857 | 0.051501 | -1.006917 | 0.3162 |
| D(GCF) | 0.084542 | 0.079341 | 1.065548 | 0.2890 |
| D(GCF(-1)) | 0.037822 | 0.065599 | 0.576572 | 0.5654 |
| D(GCF(-2)) | -0.030046 | 0.024026 | -1.250525 | 0.2138 |
| D(GCF(-3)) | -0.057237 | 0.060944 | -0.939161 | 0.3497 |
| C | -0.219591 | 0.377298 | -0.582009 | 0.5618 |
| Mean dependent var | -0.016624 | S.D. dependent var | | 1.274590 |
| S.E. of regression | 0.642682 | Akaike info criterion | | 0.781031 |
| Sum squared resid | 45.02133 | Schwarz criterion | | 3.437494 |
| Log likelihood | 104.3196 | Hannan-Quinn criter. | | 1.838397 |

**Source:** Developed by the author using E-views

The results indicate that natural gas rents and oil rents have positive and significant impacts on unemployment rate. GDP growth rate has a positive impact on employment. Gross capital formation has a positive relationship with unemployment. Most of the variables are statistically insignificant in the short-run.

## 7. CONCLUSION

Previous studies on resource curse hypothesis measure the impact only on economic growth, hence this study is extended the analysis to include unemployment. In this study, the impact of resource curse hypothesis on unemployment in OPEC and OAPEC countries over the period from 1991 to 2016 has been examined using Pooled Mean Group – ARDL model. It can be concluded from this study that, first, there is a causal relationship from total natural resource rents to unemployment and from oil and natural gas rents to unemployment. Second, results show that the natural resource rents affect employment negatively in the long-run and has no significant impact on the short-run. Natural gas rents and oil rents affects unemployment positively in the long run.

**Table-4.** PMG-ARDL estimation for disaggregated natural resources data

| **Dependent Variable: D(UNEM)** | | | | |
|---|---|---|---|---|
| Method: ARDL | | | | |
| Included observations: 308 | | | | |
| Selected Model: ARDL(3, 3, 3, 3, 3) | | | | |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.*** |
| | Long Run Equation | | | |
| NATURAL | 0.170336 | 0.064776 | 2.629635 | 0.0098 |
| GDPG | -0.084198 | 0.012043 | -6.991686 | 0.0000 |
| GCF | 0.120231 | 0.019203 | 6.261150 | 0.0000 |
| OIL | 0.085331 | 0.011739 | 7.268788 | 0.0000 |
| | Short Run Equation | | | |
| COINTEQ01 | -0.336267 | 0.136450 | -2.464400 | 0.0153 |
| D(UNEM(-1)) | -0.032058 | 0.290432 | -0.110380 | 0.9123 |
| D(UNEM(-2)) | -0.058399 | 0.114808 | -0.508663 | 0.6120 |
| D(NATURAL) | -16.20051 | 11.43434 | -1.416829 | 0.1594 |
| D(NATURAL(-1)) | 5.880795 | 3.735988 | 1.574094 | 0.1184 |
| D(NATURAL(-2)) | 0.245644 | 1.867383 | 0.131544 | 0.8956 |
| D(GDPG) | 0.099609 | 0.059702 | 1.668441 | 0.0981 |
| D(GDPG(-1)) | 0.048803 | 0.043311 | 1.126808 | 0.2623 |
| D(GDPG(-2)) | 0.031548 | 0.026618 | 1.185180 | 0.2385 |
| D(GCF) | -0.134398 | 0.067140 | -2.001739 | 0.0478 |
| D(GCF(-1)) | -0.015290 | 0.049034 | -0.311820 | 0.7558 |
| D(GCF(-2)) | -0.010778 | 0.045141 | -0.238754 | 0.8117 |
| D(OIL) | -0.130119 | 0.080705 | -1.612280 | 0.1098 |
| D(OIL(-1)) | -0.043996 | 0.087752 | -0.501371 | 0.6171 |
| D(OIL(-2)) | -0.146868 | 0.105517 | -1.391883 | 0.1668 |
| C | 1.591012 | 0.815801 | 1.950244 | 0.0537 |
| @TREND | -0.044473 | 0.018482 | -2.406311 | 0.0178 |
| Mean dependent var | 0.004911 | S.D. dependent var | | 1.280314 |
| S.E. of regression | 0.988076 | Akaike info criterion | | 1.179006 |
| Sum squared resid | 105.4398 | Schwarz criterion | | 3.846491 |
| Log likelihood | 35.67396 | Hannan-Quinn criter. | | 2.240759 |

**Source:** Developed by the author using E-views

**Funding:** This study received no specific financial support.
**Competing Interests:** The author declares that there are no conflicts of interests regarding the publication of this paper.

## REFERENCES

Ahmed, K., M. Kumar and M. Shahbaz, 2016. Dynamics between economic growth, labor, capital and natural resource abundance in Iran: An application of the combined cointegration approach. Resources Policy, 49: 213–221. *View at Google Scholar | View at Publisher*

Antonakakis, N., I. Chatziantoniou and G. Filis, 2017. Energy consumption, CO2 emissions, and economic growth: An ethical dilemma. Renewable and Sustainable Energy Reviews, 68: 808-824. *View at Google Scholar | View at Publisher*

Badeeb, R.A., H.H. Lean and J. Clark, 2017. The evolution of the natural resource curse thesis: A critical literature survey. Resources Policy, 51(December 2016): 123–134. *View at Google Scholar | View at Publisher*

Dartey-Baah, K., K. Amponsah-Tawiah and D. Aratuo, 2012. Emerging "Dutch disease" in emerging oil economy: Ghana's perspective. Social Buses Review, 7(2): 185-199. *View at Google Scholar | View at Publisher*

Eregha, P.B. and E.P. Mesagan, 2016. Oil resource abundance, institutions and growth: Evidence from oil producing African countries. Journal of Policy Modeling, 38(3): 603–619. *View at Google Scholar | View at Publisher*

Gerelmaa, L. and K. Kotani, 2016. Further investigation of natural resources and economic growth: Do natural resources depress economic growth? Resources Policy, 50: 312–321. *View at Google Scholar | View at Publisher*

Gross, C., 2012. Explaining the (Non) causality between energy and economic growth in the U.S — a multivariate sectoral analysis. Energy Economics, 34(2): 489–499. *View at Google Scholar | View at Publisher*

James, A. and D. Aadland, 2011. The curse of natural resources: An empirical investigation of U.S. counties. Resource and Energy Economics, 33(2): 440–453. *View at Google Scholar | View at Publisher*

Mavrotas, G., S.M. Murshed and S. Torres, 2011. Natural resource dependence and economic performance in the 1970-2000 period. Review of Development Economics, 15(1): 124–138. *View at Google Scholar | View at Publisher*

Mehlum, H., K. Moene and R. Torvik, 2006. Institutions and the resource curse. Economic Journal, 116(508): 1–20. *View at Google Scholar*

Omojolaibi, J.A. and F.O. Egwaikhide, 2014. Oil price volatility, fiscal policy and economic growth: A panel vector autoregressive (PVAR) analysis of some selected oil-exporting African countries. OPEC Energy Reviews, 38(2): 127–148. *View at Google Scholar | View at Publisher*

Ouoba, Y., 2016. Natural resources: Funds and economic performance of resource-rich countries. Resources Policy, 50: 108–116. *View at Google Scholar | View at Publisher*

Sachs, J.D. and A.M. Wrner, 1995. Natural resource abundance and economic growth. (No. w5398). National Bureau of Economic Research.

Weber, J.G., 2012. The effects of a natural gas boom on employment and income in Colorado, Texas, and Wyoming. Energy Economics, 34(5): 1580–1588. *View at Google Scholar | View at Publisher*