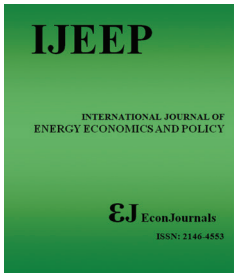

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# The Effects of Oil and Non-oil Exports on Economic Growth in Bahrain

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**ABSTRACT**

This study investigates the effect of oil and non-oil exports on economic growth in Bahrain over the period 1977-2015. The cointegration analysis shows that economic growth was positively and significantly related to exports. However, oil effects have the biggest effect on real gross domestic product. Also, results show that oil exports have a positive impact on economic growth both in the short run and in the long run. Therefore, further encouragement of non-oil sectors and higher diversification of exports would lead to positive effects on the economy.

**Keywords:** Economic Growth, Oil Exports, Causality, Bahrain
**JEL Classifications:** F11, N15, O40

## 1. INTRODUCTION

The theory of economic growth provided by the classical school of modern economics, and later supported by neo-classical economists, assumes a strong correlation between exports and economic growth. It indicates that any expansion of exports reinforces the principle of specialization in export goods. Therefore, this would reallocate resources from non-commercial sectors with low efficiency to highly productive export sectors. Consequently, exports represent an engine of growth that can create and accelerate expansion in all economic sectors. The classical theory relates the hypothesis of the relationship between trade and economic growth to the gains that the country can receive from its foreign trade. These business gains are divided into static gains, dynamic gains and commercial gains.

In this context, oil exports (OX) play an important role in the economic growth of the majority of producing countries. This is due to their high reliance on oil export earnings in financing their development projects. An increase in oil prices would potentially lead to positive effects, while the impact would be negative in case of price decline. However, there is a need to distinguish between effects of oil prices on economic growth in the short run and in the long run. An increase in oil prices might have positive effects on output in the short run, but can induce negative effects in the long run, through what is known in economic literature as the "resource curse." Export concentration on OX may negatively affect other industries, and generate "Dutch disease." It also can create high decline in demand from trade partners because of economic recessions or increasing use of energy substitutes. In addition, price volatility may lead to increased uncertainty, and often to a reduction in investment incentives and disturbance in future economic plans.

Inversely, the decline in oil prices would have a negative impact on the majority of oil producing countries, proportionally to its level of contribution to the gross domestic product (GDP) and to government budgets. In general, the decline in oil prices would reduce the incomes of exporting countries and would adversely affect their current accounts, as well as the exchange rates in some

of these countries. In turn, this would induce potential risks on financial stability.

Like other gulf cooperation council (GCC) countries, Bahrain economy depends directly upon oil. In fact, oil accounts for >70% of government revenues and >60% of export receipts. Bahrain was the first country in the region to discover oil in 1932. The timing of oil discovery was very critical, as the trade in the pearl sector had fallen, and a need for another source of income had emerged. The discovery of oil has made a quantum leap in Bahrain's economy as the economy moved from traditional crafting activities to heavy industries and infrastructure development.

With the abundance of oil and the beginning of its export, government sectors in Bahrain have begun to grow to meet the demand on government services. Also, many industrial projects associated with oil and natural gas have been carried out. The first oil refinery was built in 1935 to meet domestic and foreign demand. Mina Salman was also established in a move aimed at enhancing Bahrain's trade exchange with the rest of the world. Aluminum Bahrain Company (Alba) was created in 1968 as the first aluminum smelter in the region, followed by Gulf Petrochemical Industries Company and King Fahd causeway, in addition to other large enterprises and projects. The mentioned examples highlight the continuous importance of oil in Bahrain economy. Later, Bahrain has been able to form an environment suitable to a relative growth in non-oil sectors through legislations as well as fiscal and monetary policies, including government expenditure and subsidy, in addition to local currency stability. All these factors have given more confidence to the development of the private sector in Bahrain.

This paper studies the contribution of OX to Bahrain economic growth in the short run and in the long run. The rest of the paper is organized as follows. Section 2 presents a literature review related to the research. Section 3 shows the methodology, data and model specification used in the study. Section 4 discusses the empirical results and analyzes the findings. Finally, Section 5 concludes with an emphasis on economic policy recommendations.

## 2. LITERATURE REVIEW

Since the 1950s, the discussion of export diversification and its relation to economic growth has been an essential topic. Singer (1950) argued that strong export concentration of primary goods in developing countries delays growth as well as the terms of trade and increases income volatility. Export diversification takes place when the extensive margin of exports and extensive margin of trade grow in a specific country. These margins grow through an increase in existing export products, or through export flows to new markets and new products (Amurgo-Pacheco and Pierola, 2008).

The relationship between export diversification and economic growth has been found to be mostly positive in the literature. Using a conventional cross sectional country growth regression, Al-Marhubi (2000) finds that export diversification is positively related to the economic growth. Herzer and Nowak-Lehmann (2006) analyze the link between export diversification and economic growth in Chile. The study finds evidence that Chile has benefited from diversifying its export products. Hesse (2009) finds a strong link between export diversification and economic growth for developing countries. Al-Yousif (1997) studied the relationship between exports and economic growth in four GCC countries, namely Kuwait, Oman, KSA and UAE over a period of 20 years, and concluded that there is no long-run relationship between exports and economic growth. Pineres and Ferrantino (2000) consider that export diversification might lead to knowledge spillovers from new techniques of production, new management or marketing practices, potentially benefiting other industries.

On the other hand, export concentration, notably when a country becomes highly dependent on the exports of natural resources, has been proven to have a negative effect on economic growth. In their study of 95 abundant natural resources' countries, Sachs and Warner (1995) showed a negative relationship between growth and exports of primary goods. Same results of a negative correlation between exports of natural resources and growth were found in the study of Hodler (2006). Sala-i-Martin and Subramanian (2013) linked the negative effect of the natural resources to corruption. Also, Auty (2001) showed that the negative role of resources abundance on economic performance is due to the corruption and rent seeking behavior caused by the resources. However, Brunnschweiler (2008) found a positive effect of natural resources' abundance on economic growth when the impact of institutional quality is considered. Dogruel and Tekce (2010) showed a negative relation between economic growth and export concentration when they studied selected MENA countries.

An important consideration related to export concentration and the dependence on natural resources exports, is that export concentration would lead to a Dutch disease through a decrease in the competitiveness of the tradable exports resulting from the appreciation of the national currency. Stijns (2005) found some evidence of Dutch disease in countries with abundant oil reserves. Nevertheless, Harb (2009) cited that Dutch disease is unlikely to occur in the case of GCC countries since foreigners represent an important composition of the labor force.

Also, export concentration, specifically in natural resources, is associated with high risk that is resulting from volatility and instability in export earnings, which can deteriorate a country's vulnerability to economic shocks. Gylfason (2001) cited that rich resources countries always neglect the need of good education. Ross (2001) showed that oil has a negative effect on democracy, and therefore on economic development in oil rich countries. Natural resource abundant countries have also weaker incentives to industrialize, as they can earn the foreign exchange needed to finance their imports without industrializing. Even when industrialization takes place in those countries, it is mostly related to capital-intensive products rather than knowledge intensive products. This would have negative consequences on human capital development and wage inequality (Bonaglia and Fukasaku, 2003; Mehlum et al., 2006).

Conversely, some economists consider that natural resources abundance does not necessarily affect economies in a negative way. Torvik (2009) showed that oil revenues might have no effect on the long-run economy. Therefore, they cannot be blamed for bad

economic performance. Also, natural resources can provide nations with an opportunity to improve new categories of competitive advantages in some sectors (Alexeev and Conrad, 2011; Cavalcanti et al., 2011). Imbs and Wacziarg (2003) showed that export concentration follows a U-shape curve: Export diversification has first a positive impact on GDP; however, reaching a high level of GDP will lead to concentration. Lederman and Maloney (2006) find that natural resources abundance leads to export concentration when the economies are open. Therefore, the disadvantages that arise from export concentration in terms of vulnerability pushes policy makers to find the best way to their country's economic growth (Cadot et al., 2012). Indeed, concentration of exports in a small group of products might increase volatility in the terms of trade, which may induce volatility in income (Frankel, 2010; Jansen, 2004).

In order to avoid the economic risk from volatility of export prices, many economists distinguish between the roles of extensive margin and intensive margin in economic growth. In this regard, Markusen (2013) showed that nations gain more from trade through an increase in extensive margin rather than intensive margin. Also, Dutt et al. (2013) showed that diversification resulting from extensive margin is more effective to economic growth than the one resulting from intensive margin. According to Hummels and Klenow (2005), extensive margin accounts for >60% of the increase in the exports of large economies. Evenett and Venables (2002) showed that extensive margin is more important to the growth of exports. Also, Berthou and Fontagne (2016) found similar findings for French exports to the rest of the world.

## 3. DATA MODEL SPECIFICATION AND METHODOLOGY

The annual data for GDP, export of oil products, export of non-oil products, capital, labor force and imports of goods and services are collected from the annual statistical reports of the Central Bank of Bahrain, World Development Indicators and International Financial Statistics. The study covers the period 1977-2015. All variables, except the labor force, are measured in million US dollars, and deflated by GDP deflator to get real values (Year 2000 is the base year).

In this context, as a starting point, the neoclassical model of growth is used. Following Hosseini and Tang (2014), this model includes capital, labor, exports and imports. It is written as:

$$Y = f[(K,L); X,M] \quad (1)$$

The augmented production function including these variables can be expressed as:

$$Y = AK\alpha L\beta X\gamma M\lambda \quad (2)$$

Where, Y: Represents GDP,

K: Represents Capital,

L: Represents Labor,

X: Represents Exports,

M: Represents imports;

And A shows the level of technology in the country, which is assumed to be constant.

$\alpha, \beta, \gamma, \lambda$ represent respectively the returns to scale associated with capital, labor, exports and imports.

In linear functional form, the Cobb-Douglas production function is presented as follows:

$$\text{Log } (Y_t) = \text{Log } (A)+\alpha \text{ Log } (K_t)+\beta \text{ Log } (L_t)+\gamma \text{ Log } (X_t)+\lambda \text{ Log } (M_t)+\varepsilon_t \quad (3)$$

Following Mohsen (2015), when we distinguish between OX and other exports, the following equation can be written as:

$$X = OX+NOX \quad (4)$$

Equation (4) presents the division between OX and non-oil exports (NOX). In equation (5), (OX) and (NOX) are relocated into logarithms in order to carry out the linear form of the Cobb–Douglas production function.

$$\text{Log } (X_t) = \text{Log } (OX_t)+\text{Log } (NOX_t) \quad (5)$$

When Equations 3 and 5 are merged, the model of estimation is represented by the following equation:

$$\text{Log } (Y_t) = \text{Log } (A)+\alpha \text{ Log } (K_t)+\beta \text{ Log } (L_t)+\gamma \text{ Log } (OX_t)+\delta \text{ Log } (NOX_t)+\lambda \text{ Log } (M_t)+\varepsilon_t \quad (6)$$

In order to examine the effect of OX on economic growth in Bahrain, an estimate based on the cointegration approach is applied. The empirical methodology of this analysis consists first in determining the stationarity of the variables and the order of integration of each variable. For this purpose, Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) tests are used. In this step, it is important to determine the number of lags by using a set of information selection criteria (Tables 1 and 2). As soon as the number of lags is fixed, Johanson testis used to examine the cointegration between the variables involved in the model. If a cointegration relation is found, an error correction model would be used in the analysis.

## 4. EMPIRICAL ANALYSIS

Table 1 presents the results of ADF and PP integration order tests. According to these last two tests, all variables considered in the study have unit roots at level. The hypothesis of presence of unit roots is rejected at first difference. This indicates that all variables are integrated of first order (Table 2).

The study proceeds to the next step of studying the cointegration between the variables applied in the model. Based on Schwarz criteria, one period lag has been selected to estimate cointegration. The results of the Johanson test at one period lag (Table 3) prove the existence of a cointegration relationship between economic growth, OX, NOX, labor, capital and imports.

**Table 1: Unit root tests (ADF and PP)**

| Variables | ADF | | PP | |
|---|---|---|---|---|
| | Constant | Constant, linear trend | Constant | Constant, linear trend |
| InY | −2.193809 [−7.256893]* | −2.588476 [−7.865923]* | −2.192907 [−7.098532]* | −2.557392 [−7.328813]* |
| InK | −1.349148 [−5.059863]* | −1.452842 [−5.653289]* | −1.349278 [−5.043913]* | −1758091 [−5.832518]* |
| InL | −1.454158 [−5.125896] | −1.885236 [−5.235687]* | −1.396321 [−5.032841]* | −1.846273 [−5.089132]* |
| InOX | −1.785462 [−7.589654]* | −1.985552 [−7.698523]* | −1.785459 [−7.613281]* | −1.995482 [−7.728231]* |
| InNOX | −1.205236 [−4.985623]* | −1.725689 [4.785643]* | −1.205487 [−4.992563]* | −1.730184 [−4.805129]* |
| InM | −0.756891 [−4.325682]* | −1.698547 [−4.2135686]* | −0.778693 [−4.335818]* | −1.684291 [−4.230293]* |

*Denotes significance at the 1% level, ( ) denotes stationarity at level, [ ] denotes significance at first difference, ADF: Augmented Dickey-Fuller, PP: Philips-Perron, OX: Oil exports, NOX: Non-oil exports, K: Capital, L: Labor, M: Imports, GDP: Gross domestic product, Y: GDP

**Table 2: Lag order selection criteria**

| Lags | Log L | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | 50.5682 | NA | 3.67e-12 | −1.389384 | −0.985642 | −1.098567 |
| 1 | 112.0532 | 157.5892 | 2.82e-09 | −6.185268 | −5.825697* | −6.253894 |
| 2 | 137.5893 | 51.13568* | 1.69e-04* | −6.623589* | −4.943652 | −6.589325* |
| 3 | 145.5834 | 13.15236 | 3.213561 | −6.098563 | −3.587463 | −5.412563 |

*Indicates lag order selected by the criterion. LR: Sequential modified LR test statistic (each test at 5% level). FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

**Table 3: Johansen test**

| Unrestricted cointegration rank test (Trace) | | | | |
|---|---|---|---|---|
| **Hypothesized number of CE (s)** | **Eigen value** | **Trace statistics** | **0.05 Critical value** | **Prob.**** |
| None* | 0.785642 | 89.45269 | 62.87459 | 0.0000 |
| At most 1* | 0.526324 | 42.65871 | 40.58965 | 0.0241 |
| At most 2 | 0.395862 | 20.58972 | 25.69871 | 0.1687 |
| At most 3 | 0.152468 | 5.489743 | 13.65748 | 0.4576 |
| **Unrestricted cointegration rank test (maximum eigenvalue)** | | | | |
| **Hypothesized number of CE (s)** | **Eigen value** | **Max-eigen statistic** | **0.05 critical value** | **Prob.**** |
| None* | 0.785642 | 46.00845 | 31.85691 | 0.0004 |
| At most 1 | 0.526324 | 23.25871 | 24.67894 | 0.0917 |
| At most 2 | 0.395862 | 16.52398 | 18.57965 | 0.1649 |
| At most 3 | 0.152468 | 5.489743 | 13.65748 | 0.4652 |

Trace test indicates 2 cointegrating eqn (s) at the 0.05 level. Max. Eigen value indicates 1cointegratingeqn (s) at the 0.05 level, *Denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) P values.

**Table 4: Estimate of long-run co-integrating vector**

| Normalized coefficients | | | | | | | |
|---|---|---|---|---|---|---|---|
| **GDP** | **K** | **L** | **OX** | **NOX** | **M** | **C** | **Trend** |
| 1.00 | −0.75932* | 0.65894 | −0.85253* | −0.37124* | 0.75942 | −3.52416 | 0.06352* |
| t-values | −6.53894 | 4.29361 | −6.03541 | −2.75216 | 4.87921 | | 6.87546 |

*Denotes significance at the 1% level. OX: Oil exports, NOX: Non-oil exports, K: Capital, L: Labor, M: Imports, GDP: Gross domestic product

**Table 5: VECM estimates**

| Variables | Coefficients | SE | t-values |
|---|---|---|---|
| ECT (−1) | −0.635462* | 0.07526 | −6.52365 |
| D (GDP (−1)) | −0.325459 | 0.16542 | −1.98564 |
| D (OX (−1)) | −0.065218 | 0.07123 | −1.42568 |
| D (NOX (−1)) | −0.107352 | 0.12536 | −0.31547 |
| D (L(−1)) | −0.046532 | 0.09874 | 0.54126 |
| D (K (−1)) | 0.523654 | 0.19856 | 0.32546 |
| D (M (−1)) | −0.253648 | 0.15423 | −1.85632 |

$R^2$=0.812548, Lagrange multiplier (Lag 1)=(0.5146), (Lag 2)=(0.5897), (Lag 3)=(0.9254), Breush-Pagan-Godfrey test=(0.7895), Jarque-Bera test=(0.4872). *Represents significance at the 10% level. OX: Oil exports, NOX: Non-oil exports, K: Capital, L: Labor, M: Imports, VEC: Vector error correction model, GDP: Gross domestic product

The cointegration equation (Table 4) indicates that the variables capital, OX and NOX have positive and significant relationship with economic growth. Conversely, labor and imports have a negative impact on economic growth. Probably, the reason behind that is that labor in Bahrain is in large part concentrated on low-skilled labor force (mainly expatriate labor force), and that imports might hinder some domestic industries to grow.

Since variables are cointegrated, a causality analysis through vector error correction model can be made. Table 5 shows that the lagged correction term is negative and significant. Long run causality shows that more OX increases the economic growth in Bahrain. Inversely, Bahrain would suffer a decrease in economic activity in the case of low international prices.

Results of Wald test in Table 6 show that capital, OX and imports Granger cause economic growth in the short run; while labor and NOX do not. This reflects the dominance of OX in relation to other sectors.

**Table 6: VEC granger causality/block exogeneity wald tests**

| Independent variable | K | L | OX | NOX | M | Joint |
|---|---|---|---|---|---|---|
| Chi-square (P values) | 0.0623 (1)*** | 0.2471 (1) | 0.0427 (1)*** | 0.7852 (1) | 0.0547 (1)*** | 0.0652 (5)*** |

***Represents significance at the 10% level. Figures in parentheses show degree of freedom. OX: Oil exports, NOX: Non-oil exports, K: Capital, L: Labor, M: Imports, VEC: Vector error correction

## 5. CONCLUSION

Using annual series data over the period 1977-2005, this study analyzes the effects of oil and NOX on economic growth in the Kingdom of Bahrain. The cointegration test shows that both oil and NOX have a positive and significant long-run relation with economic growth. However, OX have the biggest effect on GDP. Besides, in the short run, OX induce economic growth, while the variable NOX does not. This highlights the concentration of exports on the oil industry in relation to other sectors.

Based on those results, Bahrain should accelerate the diversification process of the economy and upgrade other industrial and service sectors in order to rise the percentage of NOX in total exports. This would attenuate the impact of sudden fluctuations in oil prices. It would also improve capital efficiency and labor productivity and promote the competitiveness of Bahrain products in the global markets.

## REFERENCES


Alexeev, M., Conrad, R. (2011), The natural resource curse and economic transition. Economic Systems, 35(4), 445-461.

Al-Marhubi, F. (2000), Export diversification and growth: An empirical investigation. Applied Economics Letters, 7(9), 559-562.

Al-Yousif, Y.K. (1997), Exports and economic growth: Some empirical evidence from the Arab Gulf countries. Applied Economics, 29(6), 693-697.

Amurgo-Pacheco, A., Pierola, M.D. (2008), Patterns of Export Diversification in Developing Countries: Intensive and Extensive Margins. Washington, DC: The World Bank.

Auty, R.M., editor. (2001), Resource Abundance and Economic Development. Oxford: Oxford University Press.

Berthou, A., Fontagné, L. (2016), Variable trade costs, composition effects and the intensive margin of trade. The World Economy, 39(1), 54-71.

Bonaglia, F., Fukasaku, K. (2003), Export Diversification in Low-Income Countries: An International Challenge after Doha, OECD Development Centre Working Paper No. 209. Available from: https://www.ssrn.com/abstract=724761.

Brunnschweiler, C.N. (2008), Cursing the blessings? Natural resource abundance, institutions, and economic growth. World Development, 36(3), 399-419.

Cadot, O., Carrère, C., Strauss-Kahn, V. (2011), Export diversification: What's behind the hump? Review of Economics and Statistics, 93(2), 590-605.

Cavalcanti, T.V.D., Mohaddes, K., Raissi, M. (2011), Growth, development and natural resources: New evidence using a heterogeneous panel analysis. The Quarterly Review of Economics and Finance, 51(4), 305-318.

Dogruel, S., Tekce, M. (2011), Trade liberalization and export diversification in selected MENA countries. Topics in Middle Eastern and North African Economies, 13, 1-24.

Dutt, P., Mihov, I., Van Zandt, T. (2013), The effect of WTO on the extensive and the intensive margins of trade. Journal of international Economics, 91(2), 204-219.

Evenett, S.J., Venables, A.J. (2002), Export Growth in Developing Countries: Market Entry and Bilateral Trade Flows. Working Paper, Mimeo. p1-42.

Frankel, J.A. (2010), The Natural Resource Curse: A Survey (No. w15836). Cambridge, MA: National Bureau of Economic Research.

Gylfason, T. (2001), Natural resources, education, and economic development. European Economic Review, 45(4-6), 847-859.

Harb, N. (2009), Oil exports, non-oil GDP, and investment in the GCC countries. Review of Development Economics, 13(4), 695-708.

Herzer, D., Nowak-Lehmann, D.F. (2006), Is there a long-run relationship between exports and imports in Chile? Applied Economics Letters, 13(15), 981-986.

Hesse, H. (2009), Export diversification and economic growth. In: Breaking into New Markets: Emerging Lessons for Export Diversification. Washington, DC: World Bank. p55-80.

Hodler, R. (2006), The curse of natural resources in fractionalized countries. European Economic Review, 50(6), 1367-1386.

Hosseini, S.M., Tang, C.F. (2014), The effects of oil and non-oil exports on economic growth: A case study of the Iranian economy. Economic Research-Ekonomska Istraživanja, 27(1), 427-441.

Hummels, D., Klenow, P.J. (2005), The variety and quality of a nation's exports. American Economic Review, 95(3), 704-723.

Imbs, J., Wacziarg, R. (2003), Stages of diversification. American Economic Review, 93(1), 63-86.

Jansen, M. (2004), Income Volatility in Small and Developing Economies: Export Concentration Matters (No. 3). WTO Discussion Paper.

Lederman, D., Maloney, W.F., editors. (2006), Natural Resources, Neither Curse nor Destiny. Washington, DC: The World Bank.

Markusen, J.R. (2013), Putting per-capita income back into trade theory. Journal of International Economics, 90(2), 255-265.

Mehlum, H., Moene, K., Torvik, R. (2006), Cursed by resources or institutions? World Economy, 29(8), 1117-1131.

Mohsen, A.S. (2015), Effects of oil and non-oil exports on the economic growth of Syria. Academic Journal of Economic Studies, 1(2), 69-78.

Pineres, S.A., Ferrantino, M. (2000), The commodity composition of export portfolios: A comparative analysis of Latin America. Latin American Business Review, 1(3), 1-15.

Ross, M.L. (2001), Does oil hinder democracy? World Politics, 53(3), 325-361.

Sachs, J.D., Warner, A.M. (1995), Natural Resource Abundance and Economic Growth (No. w5398). Working Papers National Bureau of Economic Research.

Sala-i-Martin, X., Subramanian, A. (2013), Addressing the natural resource curse: An illustration from Nigeria. Journal of African Economies, 22(4), 570-615.

Singer, H.W. (1950), The distribution of gains between investing and borrowing countries. The American Economic Review, 40(2), 473-485.

Stijns, J.P.C. (2005), Natural resource abundance and economic growth revisited. Resources Policy, 30(2), 107-130.

Torvik, R. (2009), Why do some resource-abundant countries succeed while others do not? Oxford Review of Economic Policy, 25(2), 241-256.