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### IMPACT OF OIL PRICES TOWARD MACROECONOMIC INDICATORS OF OPEC COUNTRIES

*Najla Almalki<sup>1</sup>, Faisal Rana<sup>2</sup>*

<sup>1,2</sup> College of Business, Effat University, Qasr Khuzam St., Kilo. 2, Old Mecca Road.

P.O.BOX 34689, Jeddah 21478, Saudi Arabia.

Email: [1nmalmalki@effatuniversity.edu.sa](mailto:nmalmalki@effatuniversity.edu.sa), [2farana@effatuniversity.edu.sa](mailto:farana@effatuniversity.edu.sa)

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#### **ABSTRACT**

The world has witnessed that oil price volatility seems to play major role in the global economy. This study tends to identify the impact of oil prices on macroeconomic indicators of OPEC countries reflecting upon 15 years from 2000 to 2015 respectively. The study purpose to fulfil gap those previous and existing studies which did not fulfilled especially regarding major oil producers among OPEC countries. Meanwhile, study aimed to find out and understand effect of falling oil prices on the economy of OPEC countries and offered solution which helped in avoiding negative impact. This study focused on three major macroeconomic indicators such as GDP, current account balance (% GDP) and inflation. The ordinary least square regression was used to determine the relationship between indicator and oil prices on 7 OPEC countries which included Kingdom of Saudi Arabia, Venezuela, Kuwait, Nigeria, Iraq, Angola and Ecuador. The result showed a weak relationship between oil prices and GDP of 7 OPEC countries which their current account balance showed high sensitivity toward oil prices among Arab countries from non-Arab countries. In additions, the inflation showed sensitivity in some selected OPEC countries.

#### **INTRODUCTION**

Oil prices have been fluctuating fundamental as result of various economic and political events between various countries across the world. The main components contribute toward oil price fluctuations are war, political instability, domestic and international market issues and other alliances between different countries. The oil policies and prices are determined by Organization of the Petroleum Exporting Countries (OPEC) was founded in 1960.

Dunsby et al. (2008) mentioned OPEC was originally established by Iraq, Kuwait, Iran, Saudi Arabia and Venezuela and thereafter included Algeria, Libya, Qatar, Angola, Nigeria, United Arab Emirates and Ecuador [1]. The OPEC was aimed to create a stable oil market for producers and costumers. Each OPEC member country is responsible for supplying a specified amount of oil to maintain overall supply of crude oil.

The historic correlation differentiating the relationship between economic recession and oil price fluctuation with statistical correlation was first-ill used by Hamilton (1983) who suggested negative correlation between two factors and indicated decrease of United States growth resulted by increment of oil prices [2]. Clarida et al. (1994) concluded the real time differences realized in output growth is result of fluctuations in the exchange rates [3].

Meanwhile, Ferderer (1996) suggested more noteworthy impact of oil price fluctuations is realized on the economic activities of a country rather than variables included in monetary policy [4]. In additions. a model concerning the impact of oil prices on macroeconomic factors of various organizations was developed by Rotemberg et al. (1996) concerning period between 1948 and 1980 [5]. Furthermore, Hooker (1996) found no impact for period between 1973 and 1994 which suggested the models used by both models need to be adjusted to depict actual impact of oil price fluctuation on economic activities [6].

The oil prices changing also impact inflation of underlying countries. This impact is caused by fluctuation in overall supply and oil demand in certain country. For OPEC countries, this impact on inflation is highly significant as economy depend on oil export. Nanna and Mashi (2003) found impact of an increase in oil prices was significantly positive on real GDP of Nigeria compared negative impact of any decreasing oil prices [7].

Besides, several studies had suggested impact oil price fluctuation can both, direct and indirect on GDP growth. However, magnitude of this impact is varied by underlying country is an oil importer or exporter [8]. A similar impact has been seen on overall current account balance (% GDP) of underlying countries with regards to changing oil prices. This study purpose to fulfil gap those previous and existing studies which did not fulfilled especially regarding major oil producers among OPEC countries. Meanwhile, study aimed to find out and understand effect of falling oil prices on the economy of OPEC countries and offered solution which helped in avoiding negative impact.

## **METHODOLOGY**

The methodology used consists qualitative and quantitative research. In the qualitative research, a detailed literature review on previous studies regarded to oil prices impact toward macro-economic factors of OPEC countries was conducted. In additions, a brief portion of literature review was focused impact of oil prices on macro-economies factors of countries across the world.

The data collection was used secondary data which provided summary of existing research of academic journal articles, books, book sections, newspapers, online blogs and websites from authors in the past for qualitative part. The methodology was conducted detailed quantitative information which the data was extracted from year 2000 until 2015 respectively from World Development Indicator and World Bank. Meanwhile, regression analysis was conducted using OLS regression method through data.

The quantitative method used to evaluate impact of oil prices fluctuations on macro-economic factors was Ordinary Least Square (OLS) regression. OLS regression was used to estimate unknown parameters in a linear regression model. The least square regression was used to calculate best line fit to depict the relationship between dependent and independent variable.

In this study, OLS regression was used to describe the relationship between oil price fluctuation and macro-economic factors of 7 OPEC countries included Saudi Arabia, Venezuela, Kuwait, Nigeria, Iraq, Angola and Ecuador.

The dependent variables considered such as GDP, current account balance and inflation in each country while independent variable was oil prices in these countries for 15 years between year 2000 and 2015. The equation used was  $Y=f(x)$

where Y represented dependent variables which are GDP, current account balance and inflation. The dependent variables data were extracted from World Development Indicator based from year 2000 to 2015 respectively. The (X) represented independent variable was oil prices. The independent data was extracted from World Bank from year 2000 to 2015 respectively.

## 1. RESULT AND DISCUSSION

The regression analysis conducted for each macro-economic indicator of seven OPEC countries.

### RESULT

#### *Saudi Arabia*

In Saudi Arabia, p-value was 0.3 which more than 0.10 and t-statistics was 1.05 which lower than 1.85. The R-square percentage was relatively low and meant impact of oil price fluctuations on overall GDP of country was difficult to predict which p-value and t-statistics indicated a weak relationship between two variables.

**Table 1.** Saudi Arabia Statistical Test Result

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	3.4434	1.7266	1.9944	0.06596
<b>Oil prices (X)</b>	0.0249	0.0236	1.0546	0.30954

The p-level of current account balance of 0.07 that considered to be significant indicated strong relationship between oil prices and current account balance. In additions, t-statistic value was  $1.93 > 1.85$ . These results showed the relationship was strong to illustrate positive relationship direction indicated positive impact of oil prices on the current balance of the country.

**Table 2.** Saudi Arabia Statistical Test Result.

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	5.3387	5.4300	0.9832	0.34220
<b>Oil prices (X)</b>	0.1432	0.0742	1.9308	0.07401

For inflation, the p-level was  $0.001 < 0.10$  and t-statistical was  $3.98 > 1.85$  indicated the relationship between oil prices and inflation in Saudi Arabia was significantly strong. These results were reasonable and means that positive impact of oil price fluctuations on overall inflation of country.

**Table 3.** Inflation Statistical Test Result

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	-1.6379	1.2053	-1.3589	0.1957
<b>Oil prices (X)</b>	0.0656	0.0164	3.9873	0.0014

### *Venezuela*

In additions, p-level was more than 0.10 and t statistical was less than 1.85 showed the relationship between oil prices and GDP in Venezuela was not strong and insignificant. The R square percentage was insignificant indicted impact of oil price fluctuations on overall GDP of country was harder to predict or had no significant impact.

**Table 4.** GDP Statistical Analysis for Venezuela

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	0.7800	4.4529	0.1752	0.8635
<b>Oil prices (X)</b>	0.0257	0.0608	0.4246	0.6776

The p-level was  $0.12 > 0.10$  and t statistical was  $-1.62 < 1.85$  indicated the relationship between oil prices and inflation in Venezuela was highly insignificant and weak.

**Table 5.** Current Account Balance Statistical Analysis for Venezuela

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	12.4058	3.4019	3.6467	0.0034
<b>Oil prices (X)</b>	-0.0766	0.0470	-1.6284	0.1294

Meanwhile, the inflation had p-level was  $0.6 > 0.10$  and t-statistical was  $0.44 < 0.85$  which suggested there was no impact of oil price changes on country inflation.

**Table 6.** Inflation Statistical Analysis for Venezuela

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	25.3533	16.1838	1.5666	0.1395
<b>Oil prices (X)</b>	0.0992	0.2210	0.4487	0.6776

### *Kuwait*

In Kuwait, p-level was not less than 0.1 and t-statistic was not higher than 1.85 which did not meet the standard. Therefore, the relationship was weak between two variables.

**Table 7.** GDP Statistical Analysis for Kuwait

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	6.6317	3.6095	1.8373	0.0845
<b>Oil prices (X)</b>	-0.0354	0.0493	-0.7198	0.4835

Meanwhile, the current account balance of Kuwait suggested p-level was 0.006 indicated very strong relationship between oil prices and current account balance. The t-statistic was  $3.20 > 1.85$  indicated significant positive relationship between variables.

**Table 8.** Current Account Balance Statistical Analysis for Kuwait

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	16.2814	5.3149	3.0634	0.0084
<b>Oil prices (X)</b>	-0.0354	0.0726	3.2019	0.0064

The inflation had scored p-level was  $0.02 < 0.10$  and t-statistical was  $2.57 > 1.85$  indicated significant strong relationship between the variables. However, R square suggested that oil price fluctuation did not had major impact on the country inflation.

**Table 9.** Inflation Statistical Analysis for Kuwait

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	0.6842	1.1963	0.5719	0.5765
<b>Oil prices (X)</b>	0.0421	0.0163	2.5776	0.0291

### *Nigeria*

For Nigeria, the GDP had scored p-level was less than 0.10 and t-statistical was not higher than 1.85 which not met the standards and therefore, the relationship was weak between the variables.

**Table 10. GDP Statistical Analysis for Nigeria**

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	10.8846	1.1963	2.5358	0.0238
<b>Oil prices (X)</b>	-0.0505	0.0163	-0.8615	0.4035

The current account balance had p-level was 0.3 and t-statistical was -0.98 which not met the standard. Therefore, the relationship between the variables was weak.

**Table 11. Current Account Balance Statistical Analysis for Nigeria**

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	15.6609	5.7766	2.7111	0.0178
<b>Oil prices (X)</b>	-0.0765	0.0776	-0.0913	0.3428

Furthermore, the Nigeria's inflation had scored p-level was  $0.16 < 0.10$  and t-statistical was  $1.45 < 1.85$  meant the relationship between the variables was not strong.

**Table 12. Inflation Statistical Analysis for Nigeria**

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	14.3716	2.1519	6.6786	0.00001
<b>Oil prices (X)</b>	-0.0428	0.0294	-1.4546	0.16784

### *Iraq*

The GDP had scored p-level was  $0.5 < 0.10$  and t-statistical was  $0.6 < 1.85$  meant the relationship between oil prices and GDP was not strong.

**Table 13. GDP Statistical Analysis for Iraq.**

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	-0.5016	10.0611	-0.0499	0.9609
<b>Oil prices (X)</b>	0.0830	0.1374	0.6037	0.5557

Furthermore, Iraq current account balance suggested the p-level was  $0.03 < 0.1$  and t-statistical was  $2.67 > 1.85$ . The R square percentage was relatively high

indicated significant impact of oil prices on current account balance of Iraq indicated strong relationship between the variables.

**Table 14.** Current Account Balance Statistical Analysis For Iraq

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	-17.7424	10.1209	-1.7531	0.1301
<b>Oil prices (X)</b>	0.3204	0.1198	2.6742	0.0368

Meanwhile, Iraq had scored p-level was not less than 0.10 and t-statistical was not higher than 1.85 which did not meet the standards. Therefore, the relationship was weak between variables.

**Table 15.** Inflation Statistical Analysis for Iraq

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	14.3716	2.1519	6.6786	0.00001
<b>Oil prices (X)</b>	-0.0428	0.0294	-1.4546	0.16784

### *Angola*

In additions, Angola GDP had the p-level was not less than 0.10 and t-statistical was not higher than 1.85 which was not met the standards. Therefore, the relationship was weak between the variables.

**Table 16.** GDP Statistical Analysis for Angola

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	4.6302	4.6266	1.0008	0.3339
<b>Oil prices (X)</b>	0.0446	0.0632	0.7058	0.4919

Meanwhile, Angola current account balance suggested the p-level was  $0.15 < 0.10$  and t-statistical was  $1.50 < 1.85$  meant the relationship between oil prices and current account balance was not strong.

**Table 17.** Current Account Balance Statistical Analysis for Angola.

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	4-2.9617	6.4534	-0.4589	0.6539
<b>Oil prices (X)</b>	0.1306	0.0867	1.5058	0.1560

Meanwhile, p-level for inflation was  $0.007 < 0.10$  meant the relationship between oil prices and inflation was significantly high.

**Table 18.** Inflation Statistical Analysis for Angola

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	165.4903	39.3576	4.2048	0.0009
<b>Oil prices (X)</b>	-1.6803	0.5376	-3.1258	0.0074

*Ecuador*

However, the Ecuador had GDP score in p-level was not less than 0.10 and t-statistical was not higher than 1.85 which not met the standard. Therefore, the relationship was weak between two factors.

**Table 19.** GDP Statistical Analysis for Ecuador

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	2.3194	1.3281	1.7464	0.1026
<b>Oil prices (X)</b>	0.0259	0.0181	1.4250	0.1761

In additions, Ecuador current account balance suggested R square was 0.89% which significantly low, no positive or negative impact could be derived. The p-level was not less than 0.10 and t-statistical was not higher than 1.85. Therefore, the relationship was weak between two variables.

**Table 20.** Current Account Balance Statistical Analysis for Ecuador.

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	-0.3869	1.6483	-0.2374	0.8178
<b>Oil prices (X)</b>	0.0080	0.0225	0.3547	0.7281

Furthermore, the p-level for inflation was less than 0.10 showed there was relationship between variables.

**Table 21.** Inflation Statistical Analysis for Ecuador.

	<b>Coefficient</b>	<b>Standard error</b>	<b>t statistical</b>	<b>p-level</b>
<b>Intercept</b>	34.7702	12.9183	2.6916	0.0175
<b>Oil prices (X)</b>	-0.3348	0.1764	-1.8974	0.0786

**DISCUSSION**

Overall study findings suggested that there was no significant impact of oil prices on macro-economic factors of OPEC countries. In additions, the regression result showed the oil prices fluctuations did not majorly impact OPEC countries GDP significantly. meanwhile, small impact was observed on the current account balance with slight positive impact toward increment in oil prices over certain period and inflation of OPEC countries selected.



Furthermore, increment in oil prices had slight negative impact toward inflation on most of OPEC countries as selected countries which observed downward trend with oil prices increment. However, no significant impact found on any selected countries regarded GDP which Arab countries had more significant in the current account balance than non-Arab countries since Arab countries depended on oil exports revenues as their main income. Although, these countries are major oil exporters in the world and their economies are deemed to be major dependent on the oil prices, the result did not show any major dependency of these over 15 years period. There were few reasons due to dissertation which only focused on oil prices fluctuation on macro-economic factors, supply and demand as well as other related factors which had joint impact on macro-economic factors on selected countries.

### CONCLUSION

In conclusions, the oil prices changed were not significant to influenced macro-economic conditions of OPEC countries. However, future study should be based on independent factors variety such as overall oil demand and supply to depict oil impact toward macro-economic factors of OPEC countries in detail. In additions, primary data such as questionnaires and interviews with government and other key economic body official should also conducted to gain their opinion and understanding with regards to oil prices impact on respective countries' macro-economies factors.

### REFERENCES

- Dunsby, A., Eckstein, J., Gaspar, J. and Mulholland S. 2008. *Commodity investing: maximizing returns through fundamental analysis* (1st ed). New Jersey: John Wiley & Sons, Inc.
- Hamilton, J. 1983. Oil and macro-economy since world war II. *The Journal of Political Economy*, 91,2 (Apr, 1983), 228-248.
- Clarida, R. and Gali, J. 1994. Sources of real exchange rate fluctuations: how important are nominal shocks? *Carnegie-Rochester Conference Series on Public Policy*, 41,1994, 1-56.
- Frederer, J. 1996. Oil price volatility and the macro-economy. *Journal of Macroeconomics*, 18,1, 1-26.
- Rotemberg, J. and Woodford, M. 1996. Imperfect competition and the effects of energy price increases on economic activity. *Journal of Money, Credit and Banking*, 28,1, 550-557.
- Hoker, M.A. 1996. What happened to the oil price-macroeconomy relationship? *Journal of Monetary Economics*, 38,2,195-213.
- Nnanna, O.J. and Masha, I. 2003. Oil price fluctuation, macroeconomic behaviour and policy response in Nigeria: a VAR specification. *West African Journal of Monetary and Economic Integration: WAJMEI*, 3,1,85-113.
- Abesinghe, t. 2001. Estimation of direct and indirect impact of oil price on growth. *Economics Letters*, 73,2,147-153.