

OIL PRICES, DOMESTIC RESOURCE GAPS, AND BREAKEVEN OIL PRICES IN THE OIL-EXPORTING COUNTRIES

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JEL: F00

date of paper receipt:
27.11.2018.

date of sending to review:
28.11.2018.

date of review receipt:
06.12.2018.

Original article

doi: 10.2478/eoik-2018-0023

**UDK: 005.52:330.133.1]:
621.892.25(53)**

SUMMARY

This paper analyzes the economic impact of the oil prices, the domestic resource gaps, and the fiscal and external breakeven oil prices on the oil exporting countries (OECs). Specifically, this paper aims to examine the empirical behaviors of the oil prices, the domestic resource gaps, and the fiscal and external breakeven oil prices along with their influence on the economy of Saudi Arabia in order to determine the oil-economic gain/loss (OEG/L) and its influences on the Saudi Arabia economy over the period of 2008 to 2018. This study uses exploratory research design, with both linear and nonlinear regression models. This paper finds the oil prices, the domestic resources gaps, and the fiscal and external breakeven oil prices exert significant influences on the economic growth in Saudi Arabia. In addition, the fiscal breakeven oil price is considerably high in Saudi Arabia and has a marginal OEG/L of USD 2.3582 per barrel. Moreover, it is observed that the oil price has an irregular and unpredictable movement behavior and co-moved with the domestic resource gaps in Saudi Arabia. The findings implies that the economy diversification in Saudi Arabia could be achieved by setting policy on improving non-oil sectors and encouraging private sector involvement.

Keywords: oil prices, economic impact, domestic resource gaps, fiscal breakeven, external breakeven

INTRODUCTION

The fiscal deficit/budget deficit is now a roaring problem in the Oil-Exporting Countries (OECs). The oil prices instability has many economic challenges in oil-exporting countries including Saudi Arabia. The fluctuations of the oil price influence certain economic indicators in Saudi Arabia. IMF (2017) contended that Saudi Arabia should price its oil at the USD 70 per barrel in 2018 in order to breakeven. The fiscal break-even oil price of Saudi Arabia in 2017 was USD 73.10 per barrel and projected to be USD 70 per barrel in 2018 (IFM, 2017). According to IMF (2017), the future market price of oil is expected to be USD 50-60 per barrel. This implies that Saudi Arabia will likely to price its oils at the current price levels of USD 50-60 per barrel (IFM, 2017). Now, Saudi Arabia is trading its oil at USD 64.17 per barrel or SAR 240.64 per barrel (IFS, 2018). Saudi Arabia is trading its oils at less than its fiscal breakeven oil price of USD 70 per barrel and more than the external breakeven oil price of USD 46 per barrel (IFS, 2018). The major implications of this breakeven cut-off of oil-exporting countries, including Saudi Arabia, are incurring the budget deficit and the slow economic growth. The budget deficit and the slow economic growth are the closest indicators of

domestic resource gaps (Palampanga and Hasanuddin, 2017). The domestic resource gap in Saudi Arabia is averaged to 16.89% of the GDP in 2016 (IDB, 2017). Given these facts, this study aimed to analyze the domestic resource gaps, the fiscal breakeven, and the external breakeven oil price behaviors and their economic impacts on OECs, particularly Saudi Arabia. Specifically, the paper answered three questions, namely:

- (1) How do oil prices, domestic resource gaps, fiscal breakeven oil prices, and external breakeven oil prices behave in Saudi Arabia for the past 10 years?
- (2) How do oil prices, domestic resource gaps, fiscal breakeven oil prices, and external breakeven oil prices influence the economy of Saudi Arabia? and,
- (3) What is the oil-economic gain/loss (OEG/L) of Saudi Arabia in the past 10 years?

STATEMENT OF THE PROBLEM

One of the main challenges of the OECs, particularly Saudi Arabia, is how to efficiently transform its economy from oil-revenue dependency to hybrid non-revenue sources. The implementation of Saudi Arabia Vision 2030 is the “first attempt” of the Saudis to reduce oil-revenue associated risks. The persistent of the fiscal deficits is observed by some researchers in Saudi Arabia (Palampanga and Hasanuddin, 2017; IDB, 2017; IMF, 2017). This paper aimed to study the nature of the fiscal deficit in relation to the empirical behaviors of oil prices, domestic resource gaps, and fiscal and external breakeven oil prices as the indicators of the economic sustainability of the OECs in which, to the best of our knowledge, have not been studied in the existing literature. This study is necessary in order to strengthen the implementation, monitoring, and evaluation of Saudi Arabia Vision 2030.

OBJECTIVES OF THE STUDY

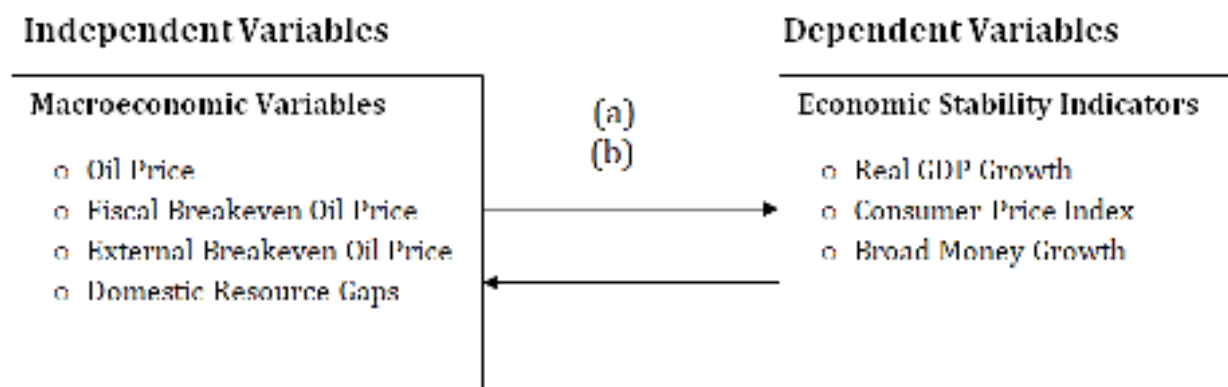
1. To examine the empirical behaviors of oil prices, domestic resources gaps, and the fiscal and the external breakeven oil prices in Saudi Arabia.
2. To examine the influence of oil prices, domestic resources gaps, and the fiscal and the external breakeven oil prices on the Saudi Arabia economy.
3. To determine the oil-economic gain/loss (OEG/L) in Saudi Arabia in the past 10 years.

THE CONCEPTUAL FRAMEWORK

The basic assumption of this study is that the oil price (OP), the domestic resource gaps (ResG), the fiscal breakeven oil price (FBEOP), the external breakeven oil price (EBEOP) have an influence on the Saudi Arabia economy. From this theoretical standing, we assume higher oil prices and lower breakeven fiscal, higher external breakeven oil prices, and lower or minimal domestic resource gaps that favor the economic growth in Saudi Arabia. This can be illustrated in the figure below (Figure 1).

Figure 1 indicates the ways that the economy of Saudi Arabia can be affected or influenced by macroeconomic variables such as the oil prices, the fiscal breakeven oil prices, the external breakeven oil prices, and domestic resource gaps. The first route indicated by (a) in the figure, is aimed to measure the direct influences (linear relationships between the variables) and the second route indicated by (b) in the figure is aimed to measure the secondary effects of the dependent variables. This is the quadratic and the polynomial regression analysis that will be used to test the relationship between the variables in route (b).

Figure 1 The Conceptual Framework on the Relationship between Macroeconomic Variables and Economic Stability Indicators



RELATED EMPIRICAL REVIEW

There are some studies addressed the impact of the oil prices in the OECs particularly in Saudi Arabia, as this country is leading the oil production out of the OPEC countries (Alsamara, Mrabet, Alafit, and Gangopadhyay, 2017, and others). Alsamara, Mrabet, Alafit, and Gangopadhyay (2017) used the ARDL approach to study the asymmetric effects of the oil prices on the economic growth in Saudi Arabia and Turkey and found a positive relationship between the oil prices and the GDP growth in the both Saudi Arabia and Turkey. Furthermore, Alkhatlan (2013), who studied the contribution of oil on the economic growth, found that oil production has a positive impact on the economic growth in Saudi Arabia. The finding supported Foudeh's (2017) study, which examined the long run effects of oil prices on the economic growth in Saudi Arabia. Foudeh (2017) used the autoregressive distributed lag (ADL) model found a strong positive relationship between the oil price and the GDP growth rate. In general, most of the studies confirmed the positive relationship between the oil prices and the economic growth in Saudi Arabia (Foudeh, 2017; Ibrahim, 2013; Akira, 2013; Clayton, 2018; Bordoff, 2017; Haque, 2014; and others).

Ibrahim (2013) investigated the impact of the financial development and the economic growth in Saudi Arabia and found that the broad money growth indicates the strength of the financial development in the country, which is likely to boost the economy in Saudi Arabia. On the other hand, Akira (2013) studied the different views of the breakeven oil prices in Saudi Arabia and concluded that Saudi Arabia is now experiencing a high fiscal deficit, as it is running at below its average fiscal breakeven oil prices. The fiscal breakeven oil prices go higher in Saudi Arabia due to the exchange rate and the high oil production rate in the country (Akira, 2013). Clayton and Levi (2015) supported Akira (2013) with studies that use the fiscal breakeven oil prices in relation to opportunities, and found the fiscal breakeven oil prices in Saudi Arabia are kept higher and the oil prices dropping in Saudi Arabia and other OECs in the world forces Saudi Arabia to experience budget deficit. Khan (2018) recommended that Saudi Arabia reduce its breakeven oil prices to a target of USD 55 in 2020 by improving the non-oil revenues, as expected by Vision 2030.

Saudi Arabia is now persistently running into a large fiscal deficit (Bordoff, 2017). The Vision 2030 commitments will be successfully achieved by the support of the stability of oil prices (Bordoff, 2017). The falls of oil prices in Saudi Arabia threaten the Vision 2030 as the non-oil sectors will not be capacitated to run in the global oil price pressures (Bordoff, 2017). Haques (2014) supported Bordoff (2017) and others that found the negative impact of oil prices drop for the Vision 2030.

Bchir and Pedrosa-Garcia (2014) investigated the impact of the oil prices shock in 2014 in Saudi Arabia and found that the oil prices drop in Saudi Arabia caused the loss of investment, economic growth, and job creation. The study supported Setser and Frank (2017) on the external breakeven oil prices in tracking the economic vulnerabilities of oil-exporting countries, citing the example of Saudi Arabia contending that it is no longer a country among the economies best prepared

to manage a prolonged period of low prices. Barajas (2011) concluded that the oil exporter benefits from the higher oil prices because the higher oil prices boost their economy by increasing investments, social spending, and public funding. It is contended that the budget deficit in Saudi Arabia is due to the oil dependency and oil volatility (Barajas, 2011). Naif, et al. (2015) suggested that Saudi Arabia should reduce or cut-off the fiscal deficit by diversifying its economy from high oil-revenue dependency to non-oil revenues. The volatility of oil prices in the global market threatens the economy of the OECs (Naif, et al, 2015; Danielson, 2016).

Various researchers have addressed the issue of economic vulnerability in the OECs, mostly with the same conclusions. The World Bank Group (2017) study on the issue of the fiscal deficit in Saudi Arabia, suggested that Saudi Arabia should improve the non-oil sectors in order to fund the oil-dependency based fiscal deficit. Arjen, (2016) supported the findings of the World Bank Group (2017) and Barisitz and Breitenfellner (2017) studies, which emphasized on strengthening the fiscal policy in the relation of oil prices shocks in Saudi Arabia and other OECs. Bagherpour and Donaldson (2016) found that the high oil production capacity of Saudi Arabia-Cartel's swing producer causes the oil prices to drop, and suggested that Saudi Arabia, should decide whether to limit the production or continue with the current level to maintain market shares.

Fahad (2017) examined the impact of the oil price crisis on the security and foreign policy in the Gulf cooperation Council (GCC) countries, including Saudi Arabia, found that the high oil prices in the OECs foster economic growth and improve political stability and defense. The oil prices go high and improve the schools and infrastructure in Saudi Arabia. Fahad (2017) explained that the negative oil-economic gain/loss (OEG/L) increases the budget deficit and positive OEG/L boosts the economic growth; improve the social spending and infrastructure in the OECs, including Saudi Arabia. The positive OEG/L increases the public funding and military strength of the OECs, particularly in Saudi Arabia (Fahad, 2017). Kitous, et al. (2016) examined the impact of low oil prices on the oil-exporting countries, citing an example in Saudi Arabia, and concluded that the impact of low oil price on the GDP is strongly correlated with the import dependence. The GDP and government revenues closely correlated with the oil price. Fattouh and Sen (2015) concluded that Saudi Arabia needed to diversify its economy to cut-off the persistently fiscal deficit. They are supported by IMF (2017), Fahad (2017), Setser and Frank (2017), Sfakianakis (2015), Malik and Jha (2016), and others.

The Strategic Saudi Arabia Update (2017) explained the steady oil drops in Saudi Arabia are due to the high production volume by US shale and others in the world that increase the supply to meet the available demand - the law of the demand. This finding supports Naif, et al, (2015) and Danielson (2016). Abiola (2017) examined the impact of the resource gap and economic growth in Nigeria and found that the resource gaps hurt economic growth and associated to a budget deficit.

RESEARCH GAP

The empirical literature in Saudi Arabia is mostly focused on the oil price and its effects on the Saudi Arabia economy. Most studies are limited on the single economic variable: the oil price. Now, we are going to transform the economy of Saudi Arabia; we need to broad our econometric variables to include other variables that will help the decision makers in implementation, monitoring, and evaluation of the Saudi Arabia Vision 2030. The literature does pin down the nature of the fiscal deficits in Saudi Arabia in relation to the domestic resource gaps and the fiscal and external breakeven oil prices in Saudi Arabia. This study included more macroeconomic variables, which are the real GDP growth, the consumer price index, and the broad money growth, which have limited discussion in literature.

METHODOLOGY

This study used an exploratory research design with both linear and nonlinear regression models (Polynomial Regression Analysis). The use of the linear and the quadratic, or polynomial, regression analysis offers the advantages of exploring the long-run of macroeconomic variables on economic stability indicators. The main data sources of this study are the World Bank Open data, the Islamic Development Bank Database (2017), the Saudi Arabia Monetary Agent (SAMA), the International Monetary Fund (IMF). The study used these sources because of their high data credibility. The study was done on the Saudi Arabia settings, using panel data from years 2008 to 2018.

MODEL SPECIFICATIONS AND DATA ANALYSIS

1. The Route (a) Model Specification (Direct/Linear Relationship Test)

This model assumes a linear relationship between the dependent and independent variables.

This means,

The real GDP growth (RGDPg), the consumer price index (CPI), and the broad money growth (BMG) are directly influenced by the oil price (OP), the fiscal breakeven oil price (FBEO), the external breakeven oil price (EBEO), and the domestic resource gaps (ResG). The empirical function is:

$$\text{Macroeconomic Variables (MaV) is a function of economic Stability (ES)} \\ \text{i.e., } ES (RGDPg, CPI, BMG) = f(OP, FBEO, EBEO, ResG)$$

2. The Route (b) Model Specifications (Non Linear/Long-Run Effects Test)

This model assumes a nonlinear relationship between the dependent and independent variables.

This means,

This is the secondary effect on the oil price (OP), the fiscal breakeven oil price (FBEO), the external breakeven oil price (EBEO), and the domestic resource gaps (ResG) due to the change of the real GDP growth (RGDPg), the consumer price index (CPI), and the broad money growth (BMG) in Saudi Arabia. It is assumed that the secondary effect occurs after the primary impact of the oil price (OP), the fiscal breakeven oil price (FBEO), the external breakeven oil price (EBEO), and the domestic resource gaps (ResG) on the real GDP growth (RGDPg), the consumer price index (CPI), and the broad money growth (BMG). The relationships are now reversed as to measure the secondary effects of the macroeconomic variables. The empirical function is:

$$\text{Economic Stability (ES) is a function of Macroeconomic Variables (MaV)} \\ \text{i.e., } MaV(OP, FBEO, EBEO, ResG) = f(RGDPg, CPI, BMG)$$

FINDINGS AND DISCUSSION

This study aims to meet three objectives, which are to examine the empirical behavior (EB) of oil prices, the domestic resource gaps, the fiscal breakeven oil prices, and the external breakeven oil prices in order to determine the influence of oil prices, the domestic resource gaps, fiscal breakeven oil prices, and external breakeven oil prices on the Saudi Arabia economy, and determine the oil-economic gain/loss (OEG/L) in the Saudi Arabia economic system.

EMPIRICAL BEHAVIOR OF OIL PRICES, BREAKEVEN OIL PRICES, AND DOMESTIC RESOURCE GAPS IN SAUDI ARABIA

The oil prices in Saudi Arabia in March 2018 was averaged to SAR 240.64 per barrel or USD 64.17 per barrel, and traded at less than its fiscal breakeven oil prices and above the external breakeven oil prices (Table 2). This means that the country has traded below the cut-off of its oil revenues and

has an advantage from external market pressure because it is trading above its external breakeven oil prices.

Table 1 Descriptive Statistics on Some Economic Indicators in Saudi Arabia 2008-2018

Descriptive Statistics						
	N	Range	Mean	Std. Deviation	Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
EBEOP	11	26.15	56.0682	8.08772	.474	1.279
FBEOP	11	68.14	77.0080	17.07086	2.701	1.279
OP(SAR/b)	11	288.90	2.9640E2	107.96904	-1.929	1.279
OP (USD/b)	11	80.45	78.7300	29.25990	-1.857	1.279
CPI	11	32.00	1.0745E2	9.74755	-.487	1.279
RGDPg	11	12.40	3.3718	3.43551	.484	1.279
BMG	9	17.41	9.7011	5.96906	-1.082	1.400
ResG	8	33.10	16.8875	11.06093	1.115	1.481
Valid N (listwise)	8					

Source: Analyzed Data from Islamic Development Bank (2018) and IMF (2017).

Table 1 explains the descriptive statistics data on some economic indicators in Saudi Arabia, sampled from 2008 to 2018. The table portrays the statistical measures that measure the central tendency and dispersion/variation of the data. These statistical measures are mean, standard deviation, range, and Kurtosis.

Table 2 Tabulated Summary of the Some Economic Indicator in Saudi Arabia

YEAR	BEEOP	BEFOP	OP(S-RA/b)	OP(US-D/b)	CPI	RGDPg	BMG	ResG
2008	50.4717	37.6114	381.9	101.84	90.4	6.3	17.96	28.1
2009	53.7992	73.6426	174.94	46.65	94.9	-2.1	10.81	9.3
2010	52.6264	69.4678	297.38	79.3	100	4.8	5.17	16.6
2011	52.8646	78.1460	407.44	108.65	105.8	10.3	13.26	26.6
2012	55.3259	77.8540	441.71	117.79	108.9	5.4	16.49	25.1
2013	59.3376	88.9175	384.45	102.52	112.7	2.7	8.35	21.2
2014	72.1502	105.7479	390.15	104.04	115.7	3.7	11.82	13.2
2015	68.7595	92.8943	198.11	52.83	118.2	4.1	2.9	-5
2016	57.2155	79.7065	152.81	37.34	122.4	1.7	0.55	?
2017	48.2	73.1	190.88	50.9	104.9	0.1	?	?
2018	46	70	240.64	64.17	108.1	0.09	?	?

Source: (Islamic Development Bank, 2018; IMF, 2017, World Bank Open Data)

Table 2 explains the summary of the data collected from the years 2008 to 2018 in Saudi Arabia. The table summarized the data values of some macroeconomic variables/indicators in a country.

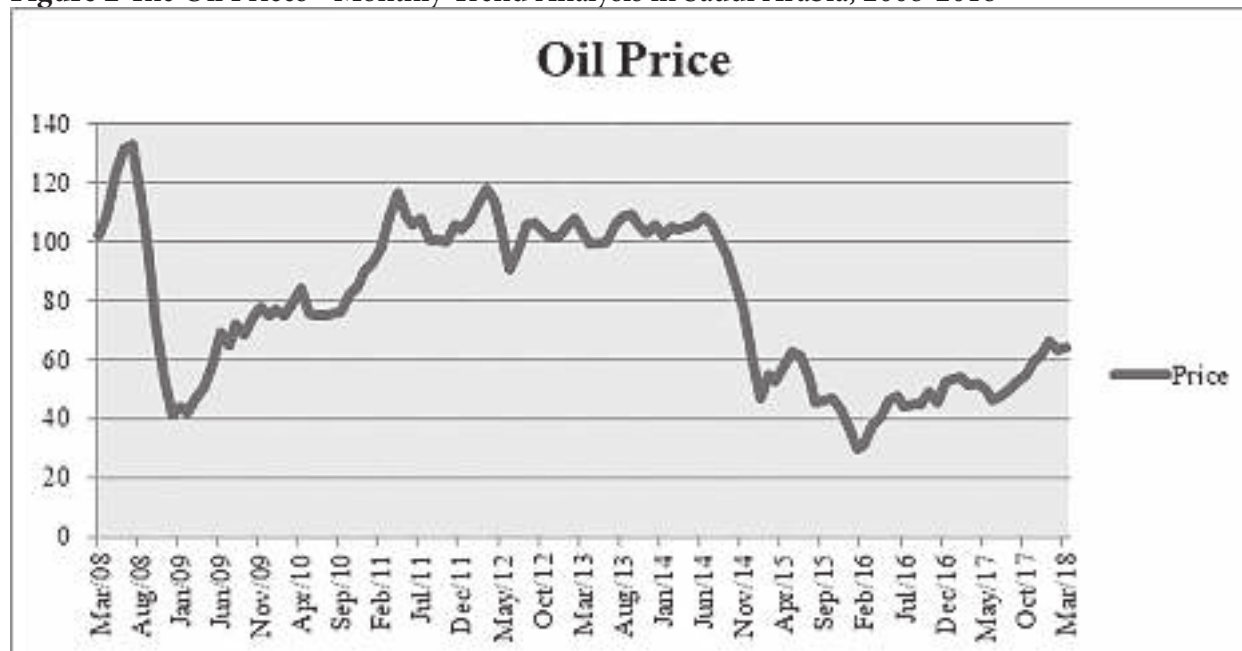
EMPIRICAL BEHAVIOR OF THE OIL PRICE IN SAUDI ARABIA

The oil price in Saudi Arabia is averaged at SAR 296.40 per barrel, or USD 78.73 per barrel, for more than 10 years. The difference between the maximum price and the minimum price attained

level is SAR 288.90 or USD 80.45 over the 10 years. This means that there is a high disparity of the data on the oil prices over the 10 years in Saudi Arabia (Figure 1 and 2). In March 2018 the price of oil was averaged to USD 64.17 per barrel (SAR 240.64), which means it traded at below the estimated fiscal breakeven oil price of USD 70 per barrel. On the other hand, the country trades its oil above the estimated external breakeven oil price of USD 46 per barrel. Saudi Arabia has a great advantage on the global oil market as it is trading above its external breakeven oil price.

In studying the time effects of oil prices (trend analysis), we reveal that the oil prices in Saudi Arabia, are substantially decreasing. This means the oil prices are now rarely increasing. For example, over the ten years studied (2008 to 2018), on July 2008 the oil price was at the highest level of USD 132.83 per barrel, in December 2008 it decreased to USD 41.34 per barrel, it continued to rise steadily until it reached USD 108.71 in May 2011. The oil price was stable for almost 5 years, from 2011 to 2014, and started to drop from USD 105.71 per barrel in May 2014 to USD 47.11 per barrel in January 2015. Furthermore, oil prices dropped to USD 31.03 per barrel in February 2016, USD 66.23 per barrel in February 2018, and to USD 64.17 per barrel in March 2018 (Figure 2). The lesson learned from these numbers is the evidence of the oil price instability behavior in Saudi Arabia. There is a shorter period of oil prices rising in comparison to the period of oil prices drop. The oil price dropping period is higher than the oil price raising period. The oil price in Saudi Arabia is slightly unstable and unpredictable. This study evidenced Saudi Arabia has hardly had time to recover from the oil prices drop.

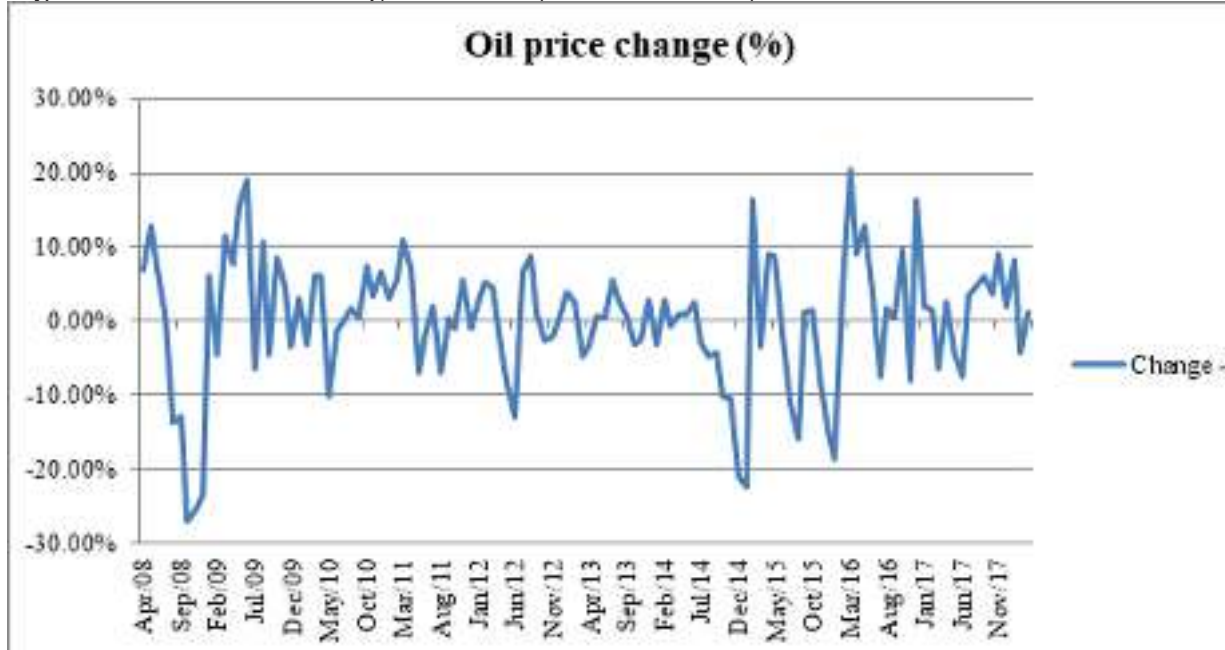
Figure 2 The Oil Prices - Monthly Trend Analysis in Saudi Arabia, 2008-2018



Source: Mundi Index (2018) and World Bank Open Data (2018)

Figure 2 describes the trend analysis of oil prices in Saudi Arabia from years 2008 to 2018. The figure evidenced the unpredictable behavior of oil prices as indicated by the non-uniform changes/patterns over 10 years.

Furthermore, the investigation was done on oil price behavior in Saudi Arabia settings by examining the oil price changes in a percentage (oil price variations). As the oil prices evidenced to change irregularly the maximum change (dropping) evidenced in the past 10 years is -27.06 percent in October 2008 and the maximum change (increasing) is 20.34 percent in March 2016 (Figure 3).

Figure 2 The Oil Price Changes – Monthly Variation Analysis in the Saudi Arabia, 2008-2018

Source: Analyzed data from Mundi Index (2018) and World Bank Open Data (2018)

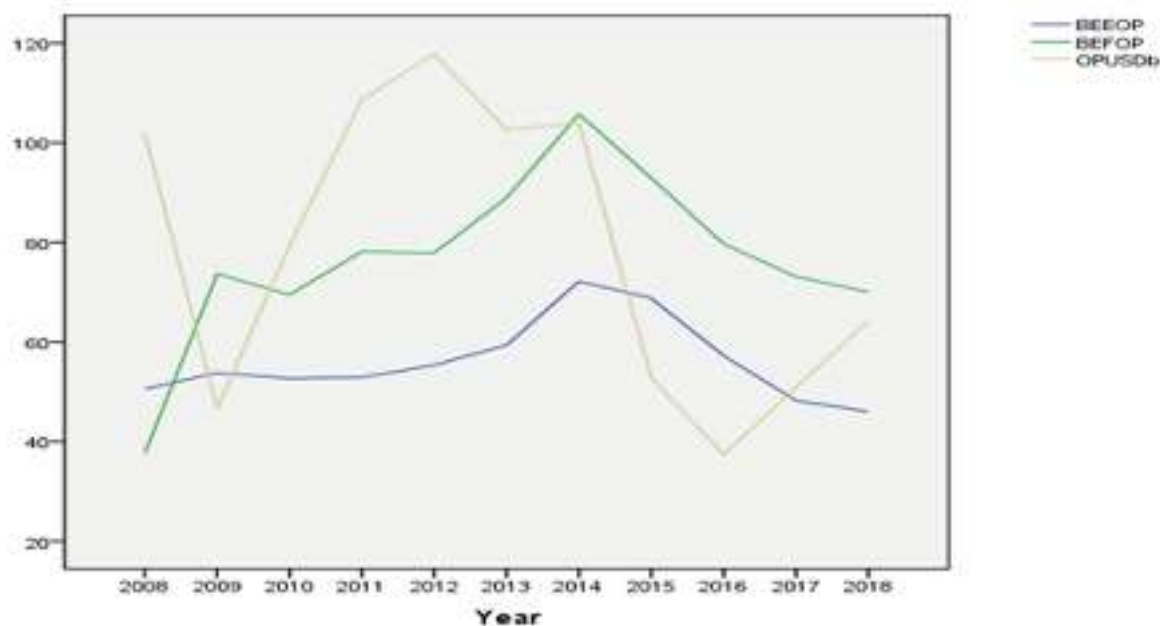
Figure 2 describes the oil price changes or the variation in percentages over 10 years in Saudi Arabia. The figure profiles the irregular changes/variation percentages of the oil prices in Saudi Arabia. The lesson learned is that the irregularity and unpredictability behavior of oil prices. This means that the oil price does not depend on a single factor or variable, it depends on some others macroeconomic factors.

OIL PRICES AND THE FISCAL AND EXTERNAL BREAKEVEN OIL PRICES IN SAUDI ARABIA

The fiscal breakeven oil price (FBEOP) and the external breakeven oil price (EBEOP) are very important indicators of the economic vulnerability in oil exporting countries (OECs). The FBEOP is the minimum price per barrel that a country will set to meet its spending with zero balance, while the external breakeven oil price is the minimum price/cost that covers the import bills. The EBEOP measures the comparative advantages in the global oil market. The oil price, the FBEOP, and EBEOP in Saudi Arabia is averaged to USD 78.73, USD 77.01, and USD 56.07 per barrel respectively. This means that the oil price is always above the EBEOP and mostly below the FBEOP. The FBEOP and EBEOP variations over the 10 years are indicated with the range of USD 68.14 and USD 26.15 per barrel respectively. This implies the higher dispersion of the FBEOP and EBEOP over the 10 years in Saudi Arabia.

There is a great relationship between the oil prices, fiscal, and external breakeven oil prices. The oil prices below the FBEOP should result in the budget deficit for the OECs. The higher the difference between the oil price and the FBEOP implies a higher budget deficit in a country. Empirically, this study found Saudi Arabia is trading its oil below the FBEOP. If this continues Saudi Arabia will cut the government spending resulting in the budget deficit otherwise increasing the non-oil revenues (Figure 3). Saudi Arabia has been exporting its oil at the price higher than its EBEOP, which means it has a higher ability to covers its import bills and less price shock from the global oil market.

Figure 3 The trend analysis of oil price, fiscal, and external breakeven oil price in Saudi Arabia, 2008-2018



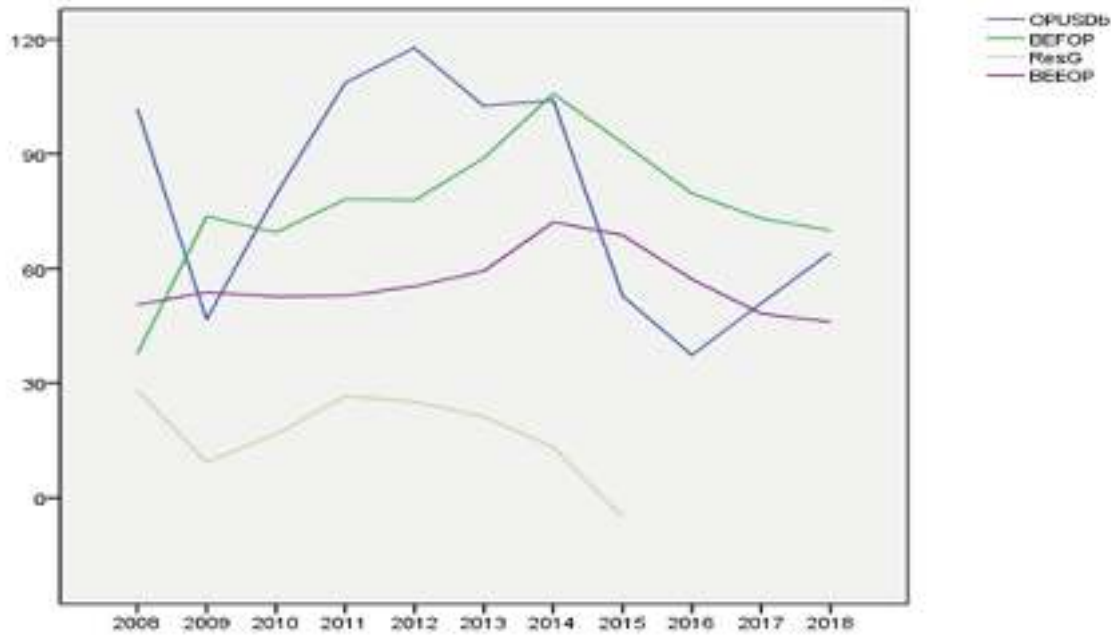
Source: Analyzed Data from Islamic Development Bank (2018) and IMF (2017).

Figure 3 explains the trend of the oil prices, fiscal, and external breakeven oil prices over 10 years in Saudi Arabia. The figure indicates the approximately parallel effects/trends of the fiscal and the external breakeven oil prices over the 10 years. This implies that both the fiscal and the external breakeven oil prices share the same influential factors (characters) as they have co-movements. However, the oil price does not relate or depend on both the FBEOP and EBEOP. The study evidenced that in 2014 Saudi Arabia traded its oil at the fiscal breakeven oil price of USD 104.04 per barrel. In 2009 the oil price was USD 46.65 per barrel, which is traded below the FBEOP (73.64) and EBEOP (53.80). This means Saudi Arabia was likely to be shocked by both the budget deficit and the global market oil price in 2014. Since 2014 Saudi Arabia is trading its oils below the FBEOP, which implies that the country compensates its budget deficit through non-oil revenues. The strategic effort of reducing the total oil economy dependency to a mixed economy system has been implemented through the Vision 2030. Saudi Arabia has the minimal pressure from the global oil market prices as it is mostly traded its oil at above the EBEOP since 2009 to 2015, even shocked in 2016, but continues to improve in 2017 and 2018.

THE EMPIRICAL BEHAVIOR OF THE DOMESTIC RESOURCE GAPS IN SAUDI ARABIA

The domestic resource gap is represented by the analyzed deficit/surplus of the current or potential resources available in a country and the resources required to meet the forecasted plans. It is simply the difference between the current resources of a nation and the forecasted resources to meet the future plans. Over the 8 years the domestic resource gaps in Saudi Arabia is averaged to 16.89% of the GDP, with a range of 33.10%. In 2015 the domestic resource gap dropped to -5.0% of the GDP. This indicates the budget deficit that highly linked to the drops of oil prices. The determination of the domestic resource gaps in the OECs is very important because the countries highly depend on a single resource: the oil reserves are more vulnerable than the undesirable domestic resource gaps. The domestic resource gap was analyzed by this study and found that it has a parallel effect to the oil price and a negative relationship to the FBEOP and EBEOP (Figure 4).

Figure 4 The Co-Movement Analysis of Oil Price, FBEOP, EBEOP, and Domestic Resource Gaps in Saudi Arabia, 2008-2018



Source: Analyzed Data from Islamic Development Bank (2018) and IMF (2017).

Figure 4 describes the co-movements of the oil prices, the domestic resource gap, and the fiscal, and the external breakeven oil prices in Saudi Arabia from the years 2008 to 2018. This empirical study evidenced the co-movement/parallel effect of the domestic resource gaps and oil prices, and negative or diverging movements with the FBEOP and EBEOP over the 10 years.

This study observed the dropping of oil prices in the year 2008 from USD 101.84 per barrel to USD 46.65 per barrel in 2009. This drop caused the significant changes/drops of the domestic resource gap from 28.1% of the GDP to 9.3% of the GDP in 2009. Furthermore, in 2010 the oil prices raised to USD 79.30 per barrel. This rise in oil price causes the increases/raise of the domestic resource gap from 9.3% in 2009 to 16.6% of the GDP in 2010. The lesson learned from these empirical facts of the co-movement behavior of the oil prices and the domestic resource gap is that Saudi Arabia is highly dependent on the oil revenues. Note that the FBEOP and EBEOP have a co-movement as they share the same influential economic factors. Thus, the effect or behavior of the domestic resource gap should be the same as the behavior of the oil prices in Saudi Arabia, i.e. the negative or divergence movement. For example, the rising of the FBEOP in 2008 from USD 37.61 per barrel to USD 73.64 per barrel in 2009 caused the drop of the domestic resource gap from 28.1% of GDP to 9.3% of the GDP, and the same in the next years as indicated in Figure 4.

4.1.2 The Influences of Oil Prices on the Economy of Saudi Arabia

This paper examined the influence of oil prices on the economy of Saudi Arabia. The economic indicators selected by this study are the real GDP growth, the consumer price index, and the broad money growth. The reason to use these selected economic indicators in Saudi Arabia is due to their high impact on the oil price settings in the past records.

OIL PRICES AND ECONOMIC GROWTH IN SAUDI ARABIA

The oil price examination was done closely to understand its influences on the economic growth. The real GDP growth was regressed to the oil price in USD per barrel. The linear model was determined at 50.2% with a coefficient value of 0.083, at the significant level of 95% of the confidence level that the coefficient value is not equal to zero (Table 3).

Table 3 The Regression Models of Real GDP Growth and Oil Price in Saudi Arabia

Model Summary and Parameter Estimates								
Dependent Variable: <u>RGDPg</u>								
Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	.502	9.062	1	9	.015	-3.176	.083	
Quadratic	.505	4.073	2	8	.060	-1.282	.027	.000
The independent variable is OP (USD/b).								

Source: Analyzed data from World Bank Open Data (2018), IMF (2017) and IsDB (2017)

Table 3 describes the regression model of the real GDP growth and the oil price in Saudi Arabia. The table portrays the positive relationship between the oil price and the economic growth in Saudi Arabia. This means that the increases in oil price in a country simulates/fosters the economic growth.

OIL PRICES AND THE INFLATION IN SAUDI ARABIA

This study used the consumer price index and the broad money growth to describe the inflation and its likelihood. The consumer's price index and the broad money growth were examined in relation to their effects on the oil price in Saudi Arabia. The study evidenced the negative linear relationship between the consumer price index and the oil price, but it is statistically insignificant (Table 4).

Table 4 The Regression Models of Consumer Price Index and Oil Price in the Saudi Arabia

Model Summary and Parameter Estimates								
Dependent Variable :CPI								
Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	.030	.274	1	9	.613	111.964	-.057	
Quadratic	.148	.697	2	8	.526	147.051	-1.094	.007
The independent variable is OP (USD/b).								

Source: Analyzed data from World Bank Open Data (2018), IMF (2017) and IsDB (2017)

Table 4 explains a regression model for the consumer price and the oil price in Saudi Arabia. The negative relationship between the consumer price index implies that the consumer price index (inflation) reduces as the oil prices increase. We learned that as the oil prices increase they shift up the real GDP growth (economic growth) as the results reduce the inflation in a country. This evidenced by this study (Table 3 & 4).

OIL PRICES AND THE CREDIT ABILITY AND EFFECTIVENESS OF THE FINANCIAL INSTITUTION TO SERVE THE PUBLIC IN SAUDI ARABIA

The determination of the level of the money supply in a country has an economic and financial importance on the sustainable economic growth and inclusive development. The excessive money supply in the economy is bad as is the less money supply in the economy. The optimal supply is required for a balanced economy. The broad money growth is the most used by the Central Banks to predict or forecast the inflation in a country. In this study, we go further to examine the credibility and the effectiveness of the financial institution to serve in the public. This study found

that there is a positive linear relationship between the oil prices and the credibility and effectiveness of the financial institutions to serve the public (Table 5). This means that the broad money growth facilitates the good condition for the financial institutions to offer the effective credit services to the public in Saudi Arabia.

Table 5 The Regression Models of Broad Money Growth and Oil Price in Saudi Arabia

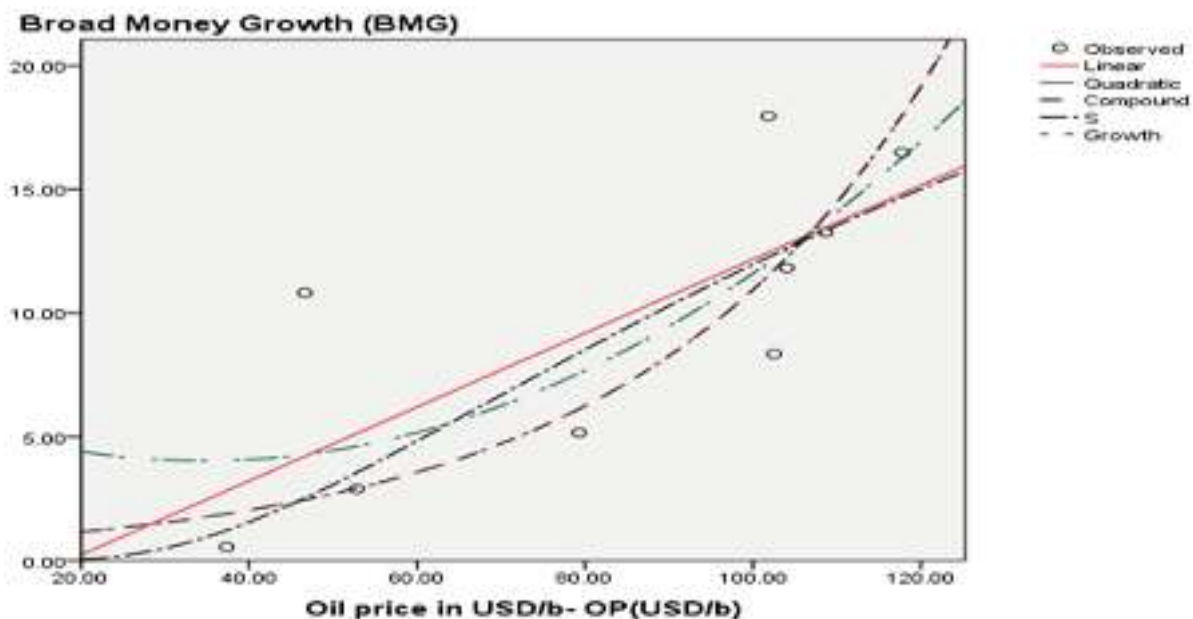
Model Summary and Parameter Estimates								
Dependent Variable: BMG								
Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	.576	9.524	1	7	.018	-2.752	.149	
Quadratic	.599	4.488	2	6	.064	6.134	-.122	.002
Compound	.587	9.931	1	7	.016	.665	1.028	
S	.661	13.647	1	7	.008	3.841	-135.890	
Growth	.587	9.931	1	7	.016	-.408	.028	

The independent variable is OP(USD/b).

Source: Analyzed data from World Bank Open Data (2018), IMF (2017) and IsDB (2017)

Table 5 explains the regression models for the broad money growth and the oil price in Saudi Arabia. The linear model determined at 57.6% and it is significant at the 5% level of significance. The linear model describes the positive relationship between the broad money growth and the oil price, with the coefficient value of 0.149. This means the broad money growth increases the ability and effectiveness of the financial institutions to serve the public. But this favor does not go further in a longer period of time; the quadratic models evidenced the negative impact and, for a long-term, the broad money growth is undesirable. The positive linear relationship between the broad money growth and the oil price is for a short-term period. From this study, we confirm the theoretical ground that the money supply should not be excessive and less in the economy. The graphical representation of the regression models is displayed in Figure 5.

Figure 5 The Graphical Representation of the Relationship between Broad Money Growth and Oil Price in the Saudi Arabia



Source: Analyzed data from World Bank Open Data (2018), IMF (2017) and IsDB (2017)

Figure 5 explains the graphical representation of the oil price and the broad money growth in Saudi

Arabia. The graph indicates the positive relationship between the oil price and the broad money growth in the short term (linear relationship) and negative relations in the long term (quadratic equation).

THE OIL-ECONOMIC GAIN/LOSS (OEG/L) OF SAUDI ARABIA

The oil economic gain/loss (OEG/L) is the financial difference between the oil price and the fiscal breakeven oil price. This value indicates the ability of the OECs to meet their spending due to the oil revenues. The positive values indicate the ability of the OECs to meet their spending through the oil revenues. The negative value indicates the budget deficit of the OECs. The OEG/L is a good indicator or tool to measure the economic vulnerability of the OECs.

This study found that the Saudi Arabia OEG/L is averaged to USD 2.3582 per barrel (Table 6). The minimum value of the OEG/L is USD -42.37 per barrel (negative means losing) and the maximum values over the 10 years is USD 71.23 per barrel. The lesson learned from this empirical observation is that Saudi Arabia, on average, is still gaining USD 2.3582 per barrel or, in other words, this value is the country oil trading profit per barrel. This gain of USD 2.3582 is due to the historical gains because now Saudi Arabia is trading its oils below the country-profit margin (Figure 6).

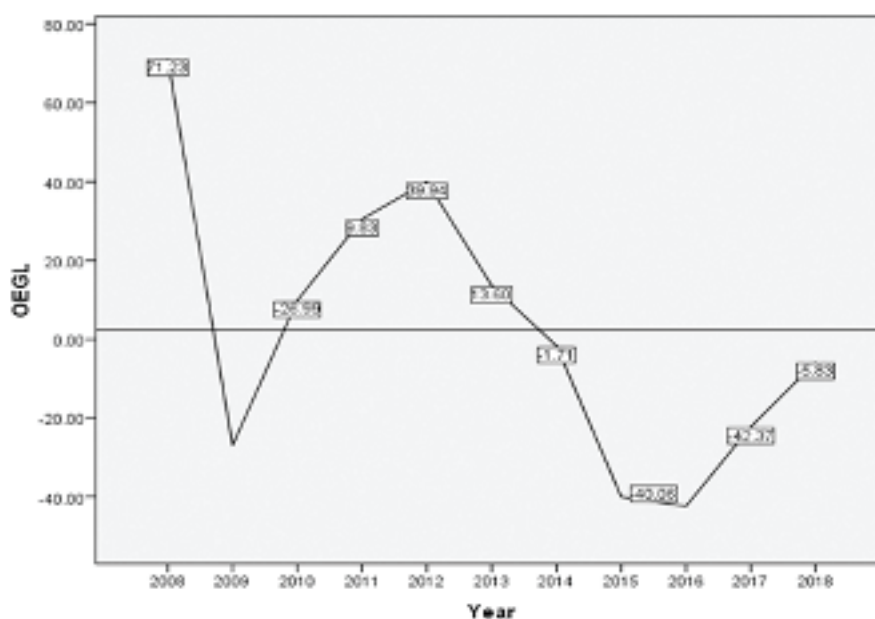
Table 6 The Descriptive Statistics on the OEG/L in Saudi Arabia for 2008-2018

	Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
OEG/L	11	-42.37	71.23	2.3582	10.65057	35.32395
Valid N (listwise)	11					

Source: IFM (2017) and IsDB (2018)

Table 6 displays the statistical measures of the OEG/L data both for the central measure of tendency (mean) and the dispersion measures (minimum, maximum, and standard deviation). The statistics portray the range of 113.6 of OEG/L from -42.32 to 71.23 and the mean standard error of 10.65, with a standard deviation of 35.32. This implies the data has the marginal statistical noise.

Figure 6 The Time Series Analysis of the OEG/L in Saudi Arabia for 2008-2018



Source: Analyzed data from World Bank Open Data (2018), IMF (2017) and IsDB (2017)

Figure 6 explains the time series analysis of the OEG/L in Saudi Arabia for more than 10 years. The figure evidences the acute drop of the OEG/L – the loss of OEG in 2009. It dropped from USD 71.23 in 2008 to USD -26.99 in 2009 and continued to drop from 2012 to 2015. Since 2016, Saudi Arabia is slowly recovering its OEG/L. Saudi Arabia from 2014 is trading its oil below its marginal country-oil profit.

THE IMPACT OF THE OEG/L ON THE ECONOMY OF SAUDI ARABIA

This study examined the OEG/L influences on some economic indicators in Saudi Arabia. The selected economic indicators are the domestic resource gap, the consumer price index, the real GDP growth, and the broad money growth. The linear regression model used to establish the impact of the OEG/L on the selected economic indicators. The model is explained at 95.2% and the standard error of the estimate is 16.86, with a Sig. F change of 0.068. This means the model is well determined with the data fits (Table 7).

Table 7 The Regression Model of the OEG/L and the Selected Economic Indicators in Saudi Arabia

Model Summary				
Dependent Variable: OEG/L				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.952 ^a	.906	.780	16.86125

a. Predictors: (Constant), ResG, CPI, RGDPg, BMG

Table 7 explains the summary of the regression model of the OEG/L and the selected economic indicators in Saudi Arabia. The model shows the standard error of the estimate to be 16.86; this indicates the less statistical noise in the model.

Table 8 The Regression Model Coefficients of the OEG/L and Selected Economic Indicators in Saudi Arabia

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.674	89.146		.052	.961
	<u>CPI</u>	-.486	.782	-.135	-.621	.578
	<u>RGDPg</u>	2.644	2.328	.257	1.135	.339
	<u>BMG</u>	1.482	1.962	.215	.755	.505
	<u>ResG</u>	1.840	1.080	.566	1.704	.187

a. Dependent Variable: OEG/L

Source: Analyzed data from World Bank Open Data (2018), IMF (2017) and IsDB (2017)

Table 8 explains the coefficients of the regression model of the OEG/L and the selected economic indicators. The coefficients models are not statistically significant. Empirically, this study evidences that the OEG/L is negatively related to the inflation in the country and has a positive influence on the economic growth, credibility, and the effectiveness of the financial institutions to serve the public and the budget deficit. This means, the higher OEG/L is likely to reduce the inflation in Saudi Arabia and, on the other hand, the higher OEG/L increases the credibility and the operational effectiveness of the financial institutions, fostering an economic growth in Saudi Arabia.

DISCUSSION

In the reflection of the literature reviewed and the findings of this study, other studies also provide support. This study found the positive influences of the oil price on the economy of Saudi Arabia. This finding is supported by some studies done in Saudi Arabia (Alsamara, Mrabet, Alafit, and Gangopadhyay, 2017; Alkhthlan, 2013; Foudeh, 2017; Ibrahim, 2013; Akira, 2013; and others). This study also confirms that the oil price dropping in the OECs, including Saudi Arabia, threatens their fiscal plans. This means that the Vision 2030 is challenged by the persistent oil price dropping (Clayton and Levi, 2015; Haque, 2014; Bchir and Pedrosa-Garcia, 2014; and others). In examining the influence of the oil prices on the economy of Saudi Arabia, this study supports Clayton and Levi (2015) and Haque (2014) studies. This study evidenced the predictability behavior of the oil prices and the co-movement with its fiscal breakeven oil prices: the fiscal breakeven oil price has a positive influence on the economic growth in Saudi Arabia.

This study examined the empirical behavior of the oil price in Saudi Arabia, found the irregularity and unpredictability of the oil price behavior over 10 years, and discovered a co-movement with the breakeven (fiscal and external). The oil prices are averaged to USD 78.73 per barrel and this study confirmed that the oil price in Saudi Arabia does not wholly and totally depend on a single economic or financial factor. These findings are supported by the studies of Malik and Jha (2016), Sfakianakis (2015), Fattouh and Sen (2015), and Fahad (2017) who found the oil price is tied to the demand theory and, on the other side, the exchange rates influence the oil price in Saudi Arabia.

The fiscal and external breakeven oil prices are averaged to USD 77.01 per barrel and USD 56.07 per barrel respectively. This study evidenced the co-movement between the fiscal and external breakeven oil prices in Saudi Arabia. The study reveals that Saudi Arabia had run the fiscal deficit due to the high dependence on the oil-revenues while price its oil is below the fiscal breakeven oil prices. Saudi Arabia experienced less pressure on the global oil prices as it is trading its oil at a higher price than its external breakeven oil prices. Some of the recommendations done by various researchers to Saudi Arabia include the diversification of its economy to non-oil revenues, as proposed by its Vision 2030 - the Saudi Arabia Vision 2030, which is aimed to reduce the oil dependency on the economic running (Malik and Jha, 2016; Sfakianakis, 2015; Fattouh and Sen, 2015). Also, this is one of the main recommendations of this paper.

This study examined the domestic resource gaps and found the decreasing of domestic resource gaps (from positive to negative). The domestic resource gap measures the national resource access to meet the future plans. In Saudi Arabia, the study found the domestic resource gap decreasing and averaged at 16.8875% of the GDP. It is observed that the domestic resource gap has parallel effects/movements with the oil price and the diverging (negation) behavior to both the fiscal and external breakeven oil prices. The domestic resource gap is found to have an impact on the fiscal budget in Saudi Arabia and related to the economic growth and the oil prices. The higher oil price reduces the domestic resource gaps and vice versa. This finding supported Abiola's (2017) study on the impact of the domestic economy in Nigeria.

This study confirmed the negative relationship between oil prices and the inflation in Saudi Arabia, that is, the consumer prices index increases when the oil price dropped and vice versa. This implies that the consumer price index (inflation) will be reduced if the oil price increases and boosts the oil and non-oil sector production and strengthening the economic growth. The dropping of the oil price results on the government budget deficit and reduction or cut-off of some social spending and subsidies.

It is evidenced that the broad money growth in Saudi Arabia has a positive impact in the short-term and a negative impact in the long run. This implies that the money supply will be limited to a certain level that will offer the optimal level for economic growth. The high speed of the broad money growth is likely to cause inflation and economic hurt. The findings in this study are supported by Malik and Jha (2016), Sfakianakis (2015), Kitous, et al. (2016), and others studies.

The oil-economic gain/loss (OEG/L) seemed to be a good indicator of the economic vulnerability of the OECs. The OEG/L is averaged to USD 2.3582 per barrel in Saudi Arabia. The OEG/L is the country profit margin that is required by a country to offset the budget deficit. This study evidenced the OEG/L has a negative impact on the inflation in Saudi Arabia. This means that the higher price variation from the fiscal breakeven oil price is likely to reduce the inflation in a country. This is true because the higher positive variation of the OEG/L offers the financial, economic, and political stability in Saudi Arabia. The positive OEG/L boosts both the oil and non-oil sector and increases the production and productivity while reducing the domestic resource gaps.

CONCLUSION AND POLICY IMPLICATION

This study was aimed to specifically meet three objectives; to examine the empirical behavior of the oil prices, the domestic resource gaps, and the breakeven oil prices; to examine the oil price influences on the Saudi Arabia economy, and; to determine the oil-economic gain/loss (OEG/L) and its influences on the economy of Saudi Arabia. In conclusion, the economy of Saudi Arabia is now challenged with a fiscal deficit due to persistent oil dropping in the global oil market. The country experiences negative domestic resources due to the oil prices dropping. The fiscal breakeven oil price is still higher in Saudi Arabia and has marginal OEG/L of USD 2.3582 per barrel. It is observed that the oil price has an irregular and unpredictable movement behavior, along with co-movements with the domestic resource gaps in Saudi Arabia. The paper has a policy implication on the economy diversification by setting policy priority on improving the non-oil sectors and encouraging private sector involvement.

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