THE EFFECTS OF AMERICAN SHALE SAND ENERGY PRODUCTION ON THE TRENDS OF INTERNATIONAL OIL PRICES DURING THE PERIOD FROM 2010 TO 2014

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ABSTRACT

The increased global demand for various types of energy has lead shale gas and shale oil to have a vital and strategic role to meet this demand. According to the predictions of international institutions in the next three decades, most of anticipated growth rate for energy consumption by type of fuel is attributed to oil and gas and among all the role of shale oil, shale gas significant. Therefore, the tendency of industrialized countries, especially United States of America / Europe / Japan and global emerging markets, especially China and India, access to new energy sources (sand) is inevitable and United States of America as the first holder of unconventional reserves of shale energy could be one of the main sources of supply of this type of energy for domestic consumption and other countries. The main objective of the current study was to investigate the effects of shale gas and shale oil energy production oil United States of America along with the effects of oil and natural gas on the trend of oil prices for the period from 2014 to 2010 using OLS method. The key innovation of research examining the role of each of Shale Gas Shale Oil and then their combined and simultaneous role on the trend of international oil prices in the mentioned period. The results of this study indicated that the emergence of the shale oil and shale gas in The United States of America and increased production of shale energy is one of the most important factors affecting volatility of international oil prices in the studied.

Keywords: Shale oil, Shale Gas, Oil production, United States of America

INTRODUCTION

Increasing need for energy communities has led to the production of energy in different ways. Conflicts, wars and regional crises of the past two decades (such as the invasion of Iraq, Libya Iranian nuclear energy crisis, Ukraine and especially gas war in Europe) has shown importance of energy and resources for economic development and progress of societies is more than ever. Since the early twentieth century onwards, among the well-known energies in the world, oil as a strategic product has affected economic and political life of the exporting countries consuming this substance. Therefore, this paper attempts to investigate the factors influencing crude oil prices and the importance of shale gas, shale Oil (a type of unconventional oil reserves in some countries, especially United States of America) the fluctuations of world oil prices and its effects on the oil exporting and oil importing countries. Finally, we continue the theme getting help of the figures and the use of statistical methods and software analysis.

Factors influencing crude oil prices

In general it can be said that like any other commodity, three factors affect the price of crude oil:

1. Fundamental factors
2. Psychological and political factors
3. Technical factors

Fundamental factors

Generally, these factors include price elasticity for economic growth and demand for alternative energy and oil demand / niche transport sector oil demand fluctuations in the dollar and oil global demand / oil demand and the stock exchange transaction.

Psychological and political factors

Political phenomena are usually psychological consequences and until there is a political phenomenon, it is also present psychological effects. Oil is a commodity but a substance extracted production. Major areas of placement of reserves, mining and manufacturing do not match with its main consumption areas. This fact has turned oil into a geopolitical phenomenon which is affected by political change, especially in supply regions.

Technical factors

These factors have short-term effects.Given the strategic importance and sensitivity of this product heavily impact of these factors on its price is more than any other commodity.

Shale Gas Shale Oil Phenomenon

Shale gas is an unconventional natural gas and because it exists in the sand and rock layers within the sedimentary basins it is

called Ardowas shale gas. Experts consider it natural gas and its origin is Ardowas stones. Because the gas is trapped between the layers of rocksa complex technology is used to extract it. Similar to the technology used in the extraction of natural gas in underground cavities. As the gas stones have no gaps and gas chambers and that's what makes the gas extraction difficult and costly. America's first gas wells drilled in 1981 are considered as extraordinary progress in the promotion of this technology.

It is expected that the share of gas in the United States of America in 2015 reaches to about 45%.Despite progress made in the field of gas will provide opportunities for economic development but environmental hazards has created many challenging issues in American and Europe. This type of gas extraction requires large amounts of water that is required to break through the layers of rock and gas extraction. Sometimes the length of the horizontal drilling underground is three kilometers and scientists know the operation of subsurface contamination with chemicals used in drilling operations. The total volume of this type of gas production in America has mutated from 15 billion cubic feet per day (bcf / d) in 2010 to 25 billion cubic feet a day in 2012.Reputation of such a success in the production of this type of gas

in US and its development at international level explanation and review of many key challenges including Water shortages, lack of infrastructure, lack of skilled labor, higher density population and the local people objections. World oil and shale gas potential, especially American continent, although in the short term is unlikely to achieve any significant results, but the medium-term and long-term outlook is amenable to a serious supply. Large demand of global transportation sector for petroleum products is growing and makes up the main source of demand in the coming years. Shale oil is an unconventional oil shale is obtained from heat crevasse hydrogenation and thermal dissolution in the shale (shale oil). These processes convert the organic matter in the (kerogen) rock to synthetic natural oil and gas. The resulting oil can be used immediately as fuel by adding hydrogen to remove impurities such as sulfur and by adding nitrogen it can be entered to the refinery as raw material.Refined products can be used in the same applications that crude oil refined products are used. Shale oil is slightly ambiguous word, and sometimes it is attributed to other types of oil obtained from other sources, therefore the International Energy Agency refers to it a tight oil or light tight oil. Oil shale (rock or shale oil) in wide

variety of nature from fresh water to salt lakes and marshes found between periods Cambrian and Tertiary sedimentary rock

formation. More of the oil shale are located in Colorado, United States of America with resources over 303 trillion tons.

Areas with known sources of oil and shale gas in the world Oil shale in the world

Kerogen probable reserves ((million tons	Kerogen reserves ((million tons	Shale oil reserves (million (tons	Location
5900	500	12.373	Africa
-	1100	20.570	Asia
36985	1100	32/400	Oceania
6500	1725	4/180	Eroupe
24600	300	35/360	Middle east
140000	4600	3340000	North America
400	9600	-	South America

Shale gas in the world

The residual gas (trillion cubic (meters	(The residual gas (trillion cubic feet	Geographical location
109	3842	North America
60	2117	Latin America
15	549	Europe
18	627	The former Soviet Union
100	3528	China and India
66	2313	Australia
72	2548	Middle East and North Africa
17	588	Other
457	16112	Total

Oil and gas potential in the United States of America

"Shale oil" once thought to be a fabulous story now becomes more real every day. The story begins at the critical point when the Americans oil companies decided to extract this kind of oil. Oil shale has no need for additional processing and it is often called "hot rock". Stone needles in different parts of the world such as Iran, but according to experts it is the largest in America and is located in the green river formation region which covers some parts of the states of Colorado, Utah and Wyoming in the covers. In some surveys the amount of shale oil in

these areas resources has been estimated around 1.2 to 1.8 thousands billion barrels. But others estimated it some 800 billion barrels oil that even this amount is more than Saudi Arabia's proven reserves. If oil shale could meet a quarter of the required reserves will last more than 400 years in America.

The results of studies show that the increase in oil production of 106 million barrels per day in 2014, a figure that represent the highest growth in the world. For the first time in the world a country has added over one million barrels per day to its oil production capacity for three consecutive years. The major feature of the new oil resources high

cost of oil production has allocated more than a third of the total investment in the industry. For example, funding for the development of the largest gas project in South Texas for $ 140 billion has been invested in 4 stages. Also to invest in Canada and the United States between 2011 and 2014 it reaches to $ 600 billion.This shows that the amount of investment in non-conventional oil and gas resources, particularly in North America has been the most substantial. It seems that the trend of increased investment in unconventional resources (shale) will continue strongly.

ExxonMobil is the largest investor in this industry in 2011 to invest $ 22 billion and increase it as well. The investment of Chevron (1) company in this area by 2013 was more than 25 billion dollars and Brazilian company Petrobras to 2014 is projected to amount to28 billion dollars. This suggests that investors think that oil

prices will not decline and development of fields in deep water, oil sands and shale gas and shale oil with this price is economic. Thus it seems that the consequences and effects of the energy revolution and deep sand will be essential for the United States of America.For example, the net oil import America in 2014 was less than half the maximum import in 2005.

America in the future will not be the world's largest oil importer and this feature has already gone to China.Just seven years later, in 2014, America's energy imports would constitute only 1% of GDP America and for America to respond almost 90% of US energy demands. A level of production that it was not reached from 1980s.

America's oil production in 2014 surpassed the previous record set in 1970. Perhaps most importantly of all is that America has managed this year to put behind Saudi Arabia and Russia and for the first time since 1975, appears as the largest oil producer in the world.

Remarks on the reality of shale gas and oil potential in the United States of America

Although America in recent years has increased its production of shale oil, reports indicate that behind this oil is environmental destruction and massive spending, when this section is mixed with misconduct of investors show another face of shale oil. For example, about the environment oil shale has many advantages and seems to reduce America's dependence on Middle Eastern oil.But it is not without problem. Information shows that the extraction of shale oil has a negative impact on air, water and ground in surrounding ground of the projects. This type

of oil distillation process produces gases such as sulfur dioxide and nitrogen oxides released into the air. The current analysis of American research institution indicated that the shale oil projects increases the amount of fog for a few weeks per year.The NRDC (Natural Resources Protection Institute) points out that greenhouse gas emissions caused by extraction twice the normal crude oil.. According to BLM report for extraction and distillation to 2.1 to 5.2 barrels of water per barrel is needed and such volume of water reduces flow rate of White River Colorado by 2.8 per cent annually.Sediment extraction process also threatens the ground water supply of "Green River". NRDC mentioned that the infrastructure needed to develop shale oil also hit local areas landscape.In addition to the environmental impact of oil shale, considerable energy is required to produce the shale oil. According to the estimations of this organization the production of one thousands barrel of oil a day requires 12 thousands mega-watt electricity (Production of electric power to serve a city of 500 thousand inhabitants). Production of a barrel of oil shale is successfully manufacturing cost per area is lower than the price of crude oil or its substitution. America Department of Energy in 2012 estimated that processed oil is

successful if oil price is above 54 dollars. Statistics International Energy Agency has estimated on the basis of pilot projects carried out that operating costs in America is similar to the cost of Canada's oil shale.It's economically efficient if the price of a barrel of crude oil is above $ 60. Of course, this figure does not pay attention to the additional costs. According to the new policies which are provided in the "world energy prospect 2010" the production company must pay 50 dollars for the production of per ton carbon-dioxide, therefore, by 2025 the cost of shale oil production per barrel would increase 7.5 dollars.

Great differences are found between statistical reporting of shale oil reserves in the United States of America and there is evidence that investors in these areas only to attract investment and encourage people to invest announce an overestimation of statistics.

In April 2014 America's Energy Information Administration (1) has released a new estimate of the country's oil shale reserves, the authorities of the organization in April (a month before the release) for the Los Angeles Times revealed that previous estimates of recoverable reserves. Oil in California (about 15.4 billion barrels) are much higher than real.The lobbyists of the oil

industry has long known oil reserves reservoir for oil and gas production America Key knew before the date anticipated reservoir Monterey twice the "Bakken in North Dakota and 5 times the area ((Eagle Ford)) in South Texas and 8.2 million jobs created by 2020, while annual income taxes 2,406 billion increase.

Analysis of the reasons for the decline in oil prices

Now the news is about energy in world oil prices fall. Ghasemi mentioned the following reasons for the decline in oil prices for the period from 2010 to 2014:

1. Reduction of America's dependence on Middle Eastern oil due to the shale oil production

2. Political security- objectives

3. Falling Demand

4. High supply of oil to world markets

5. The reduction of the growth in some of countries

1. Method of data analysis

Trends of the study variables

This section examines the trend of variables used in this research. It helps to have a general overview of the variables used in the 2014- 2010 period on a monthly basis. As well as to make a rational and appropriate analysis of oil prices, we need to examine trend variables that affect the price of oil.

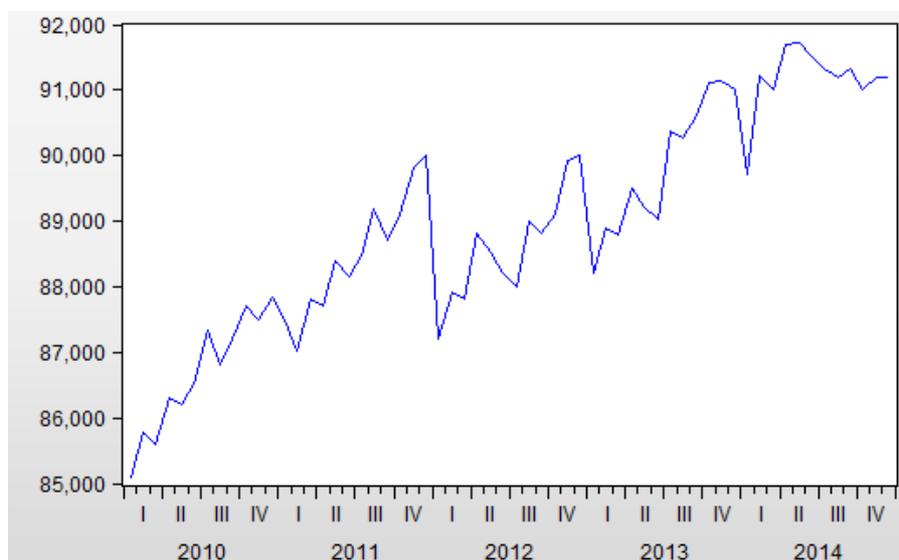1. **Trend total world oil demand in the period of the study**

Figure (1): trend of world oil demand

Energy consumption in 2010, affected by the economic recovery in the world, MET considerable growth. In that year, the growth rate of energy consumption in the OECD countries and non-OECD countries was higher than the average. Trend of the price of

energy sources in 2010 was quite different. Most of the price range of 80-70 dollar oil price fluctuated and increased in the fourth quarter. Natural gas prices in the United Kingdom and the markets related to the price of oil (including LNG), but experienced strong growth trend in North America (the development of shale gas production increase) and in continental Europe not strong enough. The average price of Brent crude oil in 2010 than in 2009 was about 29

percent and about 50/79 dollars, but the price per barrel to almost $ 18 lower than the level price in 2008. According to Figure (1) the trend in oil demand over the period 2104-2010 has an increasing trend (except in 2014). But a negative shock in the second half of 2011 in the period of the continued rise. But in 2014 the trend taken by the end of the downward trend has continued.

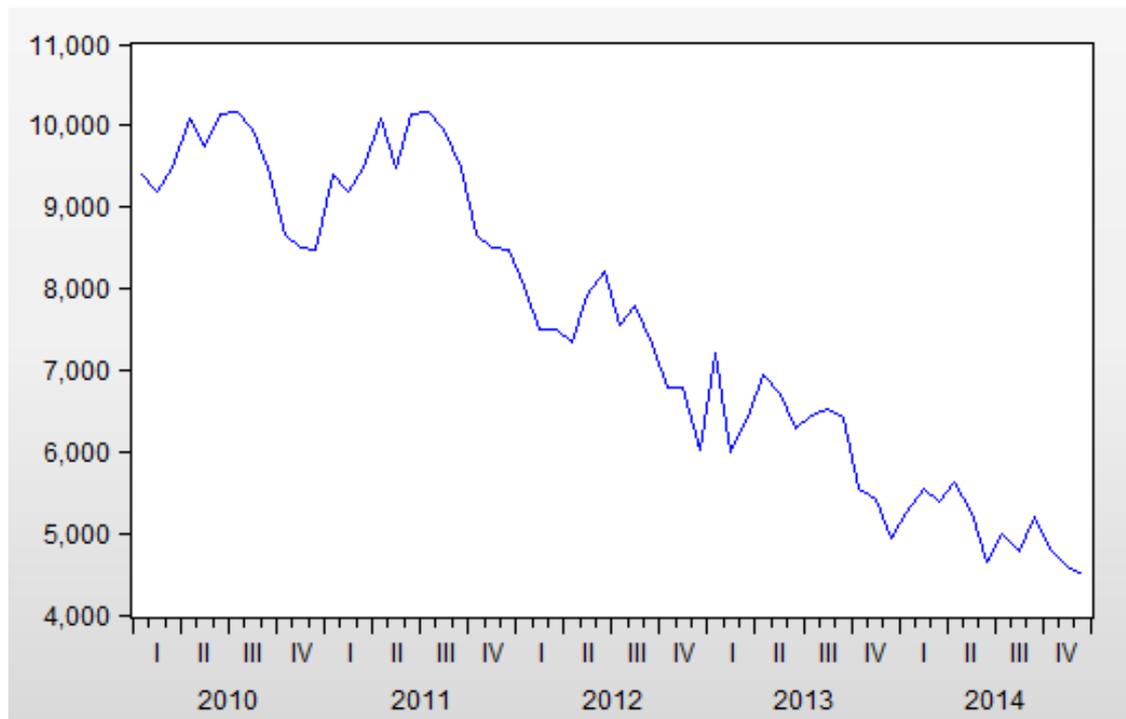2. **Trend America's oil imports in the period of the study**

Figure (2): the trend of the US imports

As it can be seen in Figure (2), the US oil import during the study period have had a decreasing trend and has decreased about 60 percent in 2014 in comparison with 2010.

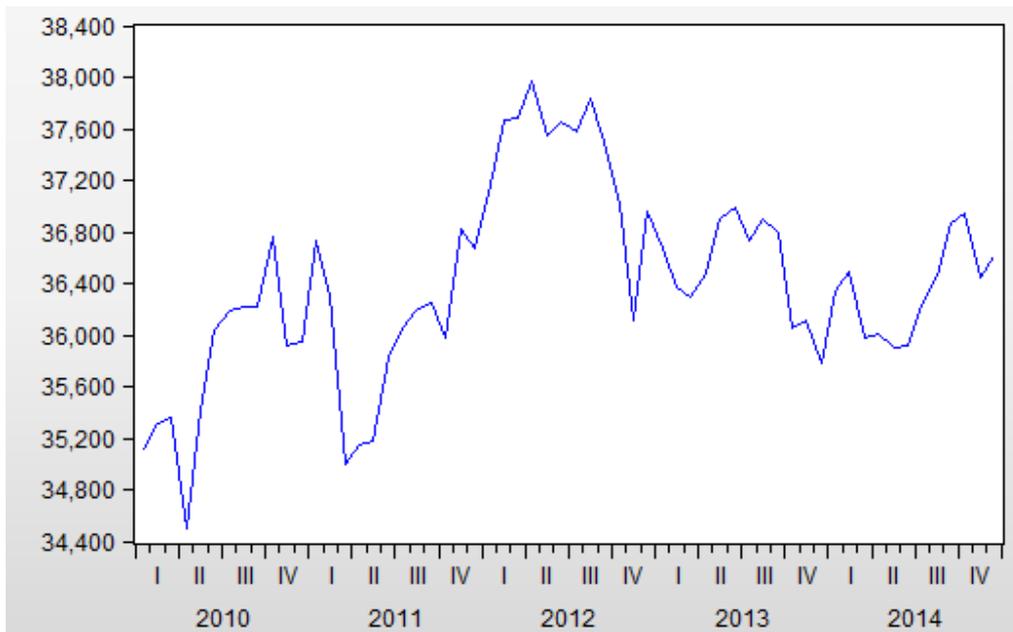3. **The trend of OPEC oil supply in the period of the study**

Figure 3: The trend of OPEC oil supply

Trend OPEC oil supply has been volatile in recent years. So that's it has experienced a big leap during 2011 to 2012. The trend of OPEC oil supply on average had been 37 million barrels.

4. **Trend of oil prices in the period of the study**
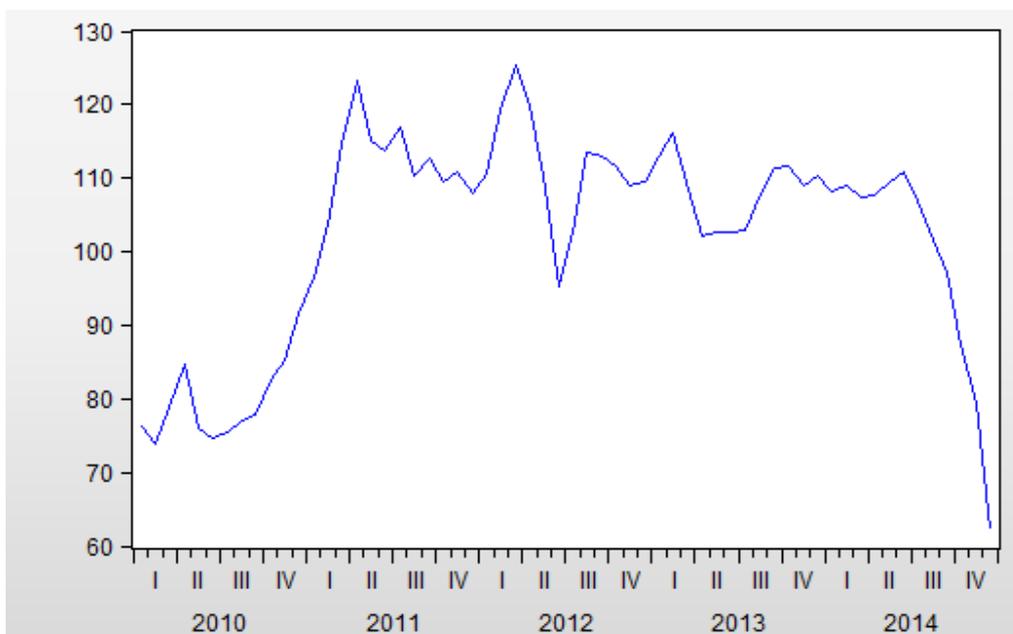

Figure 4: The trend of oil prices

Oil prices have been volatile as well as oil supply. The peak in oil prices were in late 2011, which reached about $ 130. But after a decline in early 2012 to late 2013, a period of stability has come.In 2014, a sharp fall in prices as a result of an increased supply of Saudi oil production and thus reduced the

demand for American oil shale and the price decreased from 100 $ to nearly $ 68 per barrel which is lower than the price in 2010.
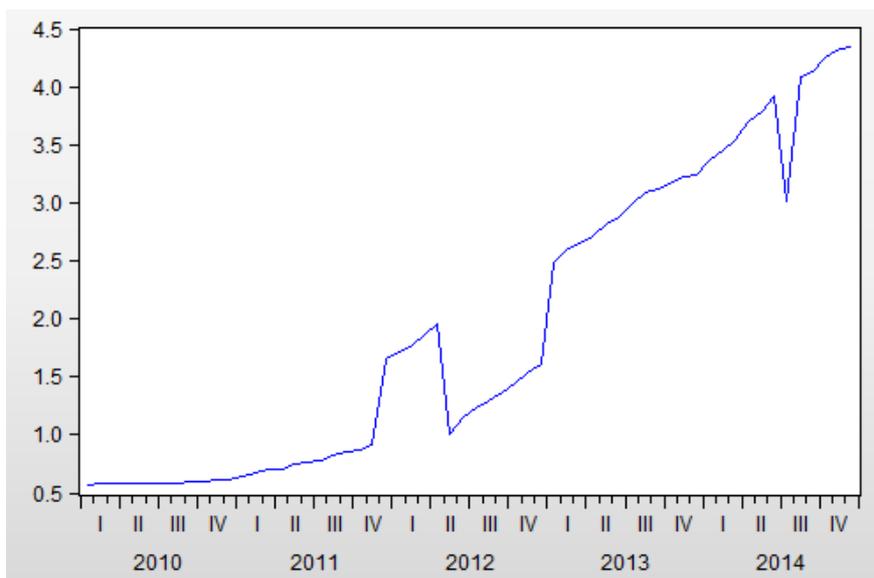
5. **The trend of American Shale Gas production in the period of the study**
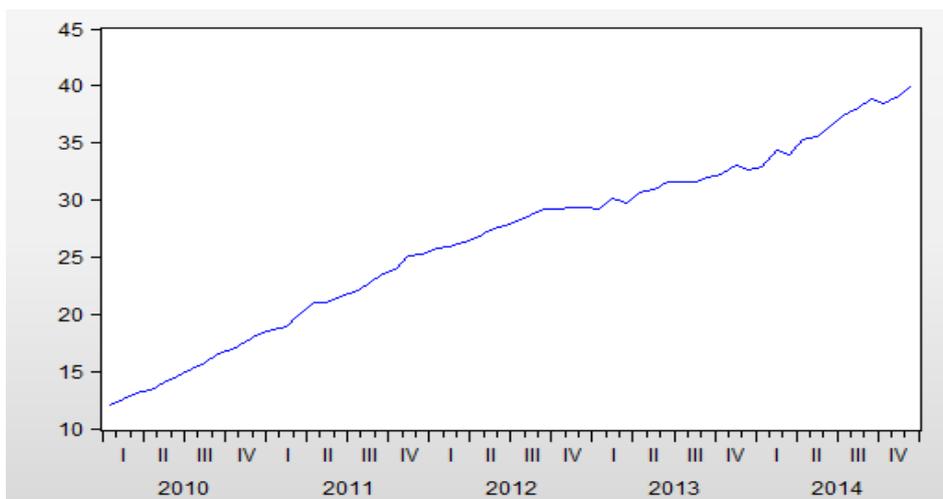
Figure 6: Trends America Shale Gas Production

The above graph shows that the production process Shale Gas America has been rising in a linear trend during the period of the study.

6. **American Shale Oil production Trend during the period under study**

Figure 6: The process of Shale Oil America

American Shale Gas production has an upward trend in 2012 to 2014 but it has experienced a structural break during this period.

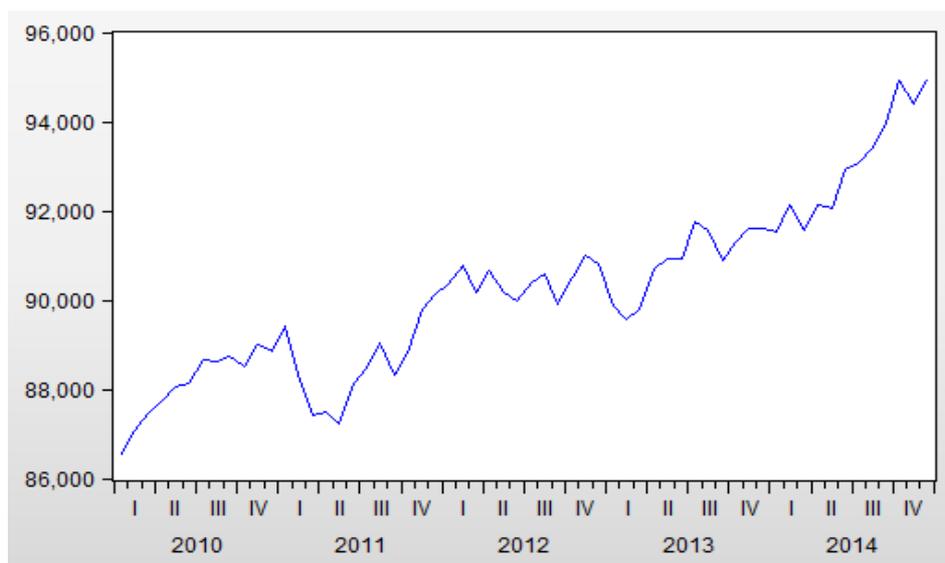7. **Trend total supply of oil in the period under study**

Figure 7: Trend of total oil supply

Figure (7) shows that the global oil supply during the period of the study has an upward sloping and during years from 2010 to 2014 reached from 86 million barrels to 95 million barrels of oil which has experienced 15% increase.

Data analysis and estimation of the regression model

This research has used time series data. As time series are often non-stationary the application of common econometric models such as ordinary least square for non-stationary time series leads to the estimation of a spurious regression and false interpretation of the results. So, before the estimation of the model the stationarity of the model should be investigated. To do so, the stationary tests and other tests were conducted to investigate the assumptions of the least square ordinary method. The results of the study confirmed the stationarity of the variables at 5% level of significance.

2. **Estimation of the model**

The estimated economic model

The expected changes in the oil prices commonly are attributed to the difference between the oil demand and supply. Despite the fact that OPEC is a supplier of secondary raw energy is changing expectations about short-term interests in oil prices normally

depends on OPEC's production capacity and supply. On the other hand, oil traders forecast prices in the estimation of future market conditions due to the market events. In other words, they take into consideration the future oil prices and supply and demand situation in the world, particularly by OPEC, OECD member countries, the global oil supply, global aggregate demand and American oil shale energy production. The general effect of these factors on the price of oil expected can be summarized as follows:

P(1)=P   world Oil supply   world Oil Demand

Us shale gas Shale Oil   OPEC Oil supply

OECD Oil supplyUS

Where, P represents the Brent oil price. In statistics and econometrics and time series analysis, an Autoregressive Integrated Moving Average (ARIMA) model is a more expanded model than weighted moving average (MA).

This model is used in time series to understand or predict the future. Here AR (1) represents the first lag of the dependent variable and MA (2) is the second order moving average. Shale energy including shale oil and shale gas can affect the price and the energy market.

Partial Model (1)

Table (1): the results of the estimation of the model (dependent variable P1)

Partial Model (1)			
(Prob)	t- statistic	Coefficient	Explanatory variables
0/000	3/39	0/090	**P**
0/000	-8/31	-0/493	**world supply**
0/009	-2/62	-0/146	**OECDSupply**
0/022	-2/29	-0/61	**Shal Gas**
0/000	-3/39	-0/352	**OpecSupply**
0/051	1/97	0/238	**Demand**
0/008	-2/73	-0/954	**AR(2)**
0/000	-4/67	-0/829	**MA(1)**
R^2 = 0/893 R^2Adjust = 0/889		Prob (F-statistic) = 0/0000	DW= 1/94

Source: study results

P(1)= /0090**P** 0 /493– **WorldSupply** 0/146– **OECDSupply** –0/61 **ShalGas**
s.t   (0/0265)   (0/059)   (0/0557)   (0/0734)
t.   (3/39)   (-8/31)   (-2/62)   (-8/31)
0/352– **OPecSupply**0/238 –**Demand**   **AR(1)** = -0/954   **MA(1)** = -0/829
s.t   (0/103)   (0/1208)   (0/0349)   (0/0177)
t.   (-3/39)   (-1/97)   (-2/73)   (-4/67)
R_Squared= 0/893   Adjust R_Squared= 0/889   DW= 1/94

According to the results in Table (1), the F-statistic indicates the significance of the

regression. In other words, the assumption that the coefficients of the independent

variables are zero was rejected. According to R^2 the explanatory power of the model show that that 89 percent of the changes in the dependent variable explained by the independent variables. Since the Durbin Watson (DW) has fallen in the 1.5<DW< 2.5, it can be said, there was no problem of autocorrelation. According to the results of the Brent crude oil price index has a significant positive effect on the oil prices in the next period and it is significant at 99% level of confidence. The estimated coefficient for this variable is 0.090. In other words, with each unit increase in the price of Brent crude oil, the price of the unit will rise 0.090. Also according to the results of model estimation, the world oil supply has a significant negative effect on the global oil prices in the next period. This effect is negative and significant at 99% level of confidence. The estimated coefficient for this variable was -0.493. In other words, with each unit increase in global oil supply, the price decreases -0.493 units. Also according to the results of the model, the oil supply member countries of OECD has a significant negative effect to oil prices in the next period This effect is negative and significant at 95% level of confidence. The estimated coefficient for this variable was -0.146.

On the other hand, according to the results of model estimation, Shale Gas has a negative and significant effect on the oil prices in the next period. This effect is negative and significant at 95% level of confidence. The estimated coefficient for this variable was -0.61. In other words, 1 percent increase in Shale Gas production, the price would decrease -.61 percent. According to the results of the model estimation the oil supply of the OPEC member countries has a negative significant effect on the oil price in the next period. This effect was negative and significant at the 95% level of significance. The value of the estimated coefficient was -0.352. In other words, 1 percent increase in oil supply would decrease the price in the next period by -0.352 percent. According to the results of model estimation, the world oil demand has a significant positive effect on the global oil prices in the next period. This effect is positive and significant at 95% level of confidence. The estimated coefficient for this variable was 0.238. In other words, 1 percent increase in the oil demand would increase the oil price by 0.238 percent in the next period.

Partial Model (2)

The results of the estimation of the second partial model were presented in Table (2).

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Table (2): the results of the estimation of the model (2) (dependent variable P1)

(Prob)	t-statistic	Coefficient	Explanatory variable
Partial model			
0/000	4/98	0/313	**P**
0/000	-8/35	-0/382	**world supply**
0/007	-2/93	-0/401	**OECD Supply**
0/000	-3/79	-0/509	**Shal Oil**
0/000	-3/39	-0/249	**Opec Supply**
0/000	3/45	0/563	**Demand**
0/000	-3/98	-0/674	**AR(1)**
0/000	-4/54	-0/504	**MA(2)**
R^2 = 0/91 R^2Adjust = 0/90		Prob (F-statistic) = 0/0000	**DW= 1/99**

Source: study results
The regression model was as follows:
P(1)= /0313P 0/493– **WorldSupply** 0/401– **OECDSupply** –0/509 **ShalOil**
s.t   (0/0265)   (0/059)   (0/0557)   (0/0734)
t.   (11/81)   (-8/35)   (-7/19)   (-6/93)
0/249– **OPecSupply**0/563 +**Demand**   **AR(1)** = -0/674   **MA(2)** = -0/504
s.t   (0/103)   (0/1208)   (0/042)   (0/0137)
t.   (-2/41)   (4/63)   (-16/04)   (-3/678)
R_Squared= 0/91   **Adjust R_Squared**= 0/90   **DW**= 1/99

According to the results in Table (2), the F-statistic indicates the significance of the regression. In other words, the assumption that the coefficients of the independent variables are zero was rejected. According to R^2 the explanatory power of the model show that that 91 percent of the changes in the dependent variable explained by the independent variables. Since the Durbin Watson (DW) has fallen in the 1.5<DW< 2.5, it can be said, there was no problem of autocorrelation. According to the results of the Brent crude oil price index has a significant positive effect on the oil prices in the next period and it is significant at 99% level of confidence. The estimated coefficient for this variable is 0.313. In other words, with each unit increase in the price of

Brent crude oil, the price of the unit will rise 0.313.

Also according to the results of model estimation, the world oil supply has a significant negative effect on the global oil prices in the next period. This effect is negative and significant at 99% level of confidence. The estimated coefficient for this variable was -0.382. In other words, with each unit increase in global oil supply, the price decreases -0.382 units. Also according to the results of the model, the oil supply member countries of OECD has a significant negative effect to oil prices in the next period This effect is negative and significant at 95% level of confidence. The estimated coefficient for this variable was -0.401. Meaning that one percent increase in the OECD member countries' oil supply would

decrease the oil price in the next period by -0.401.

On the other hand, according to the results of model estimation, Shale Gas has a negative and significant effect on the oil prices in the next period. This effect is negative and significant at 95% level of confidence. The estimated coefficient for this variable was -0.509. In other words, 1 percent increase in Shale Gas production, the price would decrease -0.509 percent. According to the results of the model estimation the oil supply of the OPEC member countries has a negative significant effect on the oil price in the next period. This effect was negative and significant at the 95% level of significance. The value of the estimated coefficient was -

0.249. In other words, 1 percent increase in oil supply would decrease the price in the next period by -0.249 percent.

According to the results of model estimation, the world oil demand has a significant positive effect on the global oil prices in the next period. This effect is positive and significant at 95% level of confidence. The estimated coefficient for this variable was 0.563. In other words, 1 percent increase in the oil demand would increase the oil price by 0.563 percent in the next period.

Comprehensive Model

The results of the estimation of the comprehensive model were presented in Table (3).

Table (3): the results of the estimation of the model (dependent variable P1)

Comprehensive model			
(Prob)	**t-statistic**	**Coefficient**	**Explanatory varible**
0/000	4/99	0/316	**P**
0/000	-8/39	-0/373	**world supply**
0/007	-2/99	-0/411	**OECD Supply**
0/000	-3/59	-0/479	**Shal Oil**
0/021	-2/66	-0/526	**Shal Gas**
0/000	-3/35	-0/235	**Opec Supply**
0/000	3/25	0/543	**Demand**
0/000	-3/99	-0/677	**AR(1)**
0/000	-4/56	-0/514	**MA(2)**
1/97	**DW**= 0/0000	**Prob (F-statistic)** = 0/91	R^2**Adjust** = 0/92R^2 =

Source: study results

The regression model was as follows:

P(1)= /0316P 0/373– **WorldSupply** 0/411– **OECDSupply** –0/479 **ShalOil** – 0/526**shailGas**

s.t   (0/0265)   (0/059)   (0/0557)   (0/0734)(0/0734)

t.   (4/99)   (-8/39)   (-2/99)   (-2/66)(-3/59)

0/235– **OPecSupply**0/677 +**Demand**   **AR(1)** = -0/674   **MA(2)** = -0/504

s.t   (0/103)   (0/1208)   (0/042)   (0/0137)

t.   (-3/35)   (3/99)   (-16/04)   (-3/678)

R_Squared = 0/92   **Adjust R_Squared** = 0/91   **DW** = 1/97

According to the results in Table (1), the F-statistic indicates the significance of the regression. In other words, the assumption that the coefficients of the independent variables are zero was rejected. According to R^2 the explanatory power of the model show that that 92 percent of the changes in the dependent variable explained by the independent variables. Since the Durbin Watson (DW) has fallen in the 1.5<DW< 2.5, it can be said, there was no problem of autocorrelation. According to the results of the Brent crude oil price index has a significant positive effect on the oil prices in the next period and it is significant at 99% level of confidence. The estimated coefficient for this variable is 0.316. In other words, with each unit increase in the price of Brent crude oil, the price of the unit will rise 0.316. Also according to the results of model estimation, the world oil supply has a significant negative effect on the global oil prices in the next period. This effect is negative and significant at 99% level of confidence. The estimated coefficient for this variable was -0.373. In other words, with each unit increase in global oil supply, the price decreases -0.373 units. Also according to the results of the model, the oil supply member countries of OECD has a significant negative effect to oil prices in the next period

This effect is negative and significant at 95% level of confidence. The estimated coefficient for this variable was -0.411.

On the other hand, according to the results of model estimation, Shale Gas has a negative and significant effect on the oil prices in the next period. This effect is negative and significant at 95% level of confidence. The estimated coefficient for this variable was -0.526. In other words, 1 percent increase in Shale Gas production, the price would decrease -.526 percent. According to the results of the model estimation the oil supply of the OPEC member countries has a negative significant effect on the oil price in the next period. This effect was negative and significant at the 95% level of significance. The value of the estimated coefficient was -0.235. In other words, 1 percent increase in oil supply would decrease the price in the next period by -0.235 percent. According to the results of model estimation, the world oil demand has a significant positive effect on the global oil prices in the next period. This effect is positive and significant at 95% level of confidence. The estimated coefficient for this variable was 0.677. In other words, 1 percent increase in the oil demand would increase the oil price by 0.677 percent in the next period.

CONCLUSION

By examining Trend shale energy production can be partly traced back to events of the future oil market. Before analysis of the results it is necessary to pay attention to any developments in the oil industry which leads to increased supply of this product such as technological progress that leads to lower costs and finding new sources and influence the falling prices of the raw oil. Technology and time required to produce energy reserves of shale is different between countries and these differences can be seen in the reaction of these countries to the oil price volatilities. In fact, level of technology appropriately affect the behavior of countries and doesn't require a new index to include it. As it was expected there is a reverse relationship between shale gas production and the raw oil price of the Brent index and the oil price falls with the increase of the shale oil production. A unit increase in the production of the shale gas the price would decrease by 0.61unit in the next period. The increase in shale oil production leads to the excess of the oil supply to the oil demand. Shale oil operates like the shale gas. As the production increases the oil price decreases. One unit increase in the shale oil production would decrease the oil price by 0.509 units. In the comprehensive model the effects of simultaneous production of shale oil and

shale gas were included to the model. The results of the estimation indicated that the production of the shale oil and shale gas has a reverse relationship with the oil price. 1 unit increase in the production volume of the shale gas will decrease the oil price by 0.526 units in the next period and 1 unit increase in the production of shale oil will decrease the oil price by 0.479 units in the market. This property can be analyzed in terms of the supply and demand relationship and in can be said that the market follows the demand and supply rule in reaction to the shale energy production. Therefore, oil producers should react due to the impact of shale energy to fluctuations. In other words, the energy production of American shale and soon other countries independently affect the price. Therefore, oil producers on one hand should pay attention to the energy supply changes in the United States of America and consider it as a direct influencing index. On the other hand, they have to reduce the psychological and economic effects of such an energy supply in the market. In fact, the psychological atmosphere in the market has a significant impact on the behavior of shale energy production and oil price. For this purpose, the first step should be created by manufacturers of direct information system,

so that the statistics provided can calm down the market.

OPEC must show greater sensitivity towards shale energy reserves and act in such a manner that these reserves don't be supplied more than the actual amount required. At least, OPEC could adopt the strategy for the minimum production against maximum production strategy of shale oil in the future, greatly reduce the occurrence of future crisis, because the oil market is not threatened only by the increase of supply as before, but any long-term imbalances could face the market with intimidation and irregularities.

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