J. Basic. Appl. Sci. Res., 2(3)2342-2346, 2012

ISSN 2090-4304
Journal of Basic and Applied Scientific Research
www.textroad.com

The Investigation of Effective Factors on Oil Demand in World

Ramin Alinejadshahabi[1], Hadi Shamizadeh[1], Ali Shamizadeh[2], Gholamhossein Masoudi Reyhani[3]

[1]Department of Chemical Engineering, Heris Branch, Islamic Azad University, Heris, Iran
[2]Chemical Engineering Department, Heris Branch, Islamic Azad University, Heris, Iran,
[2]Department of Management, Heris Branch, Islamic Azad University, Heris, Iran

ABSTRACT

Oil is the one the most important factors in countries economic relationship and plays a critical rule in geopolitical and regional relations. Appropriate policy responses to world oil market conditions may well depend on whether the factors that pushed the market to its current level are likely to be temporary or permanent. So in this research, the effects of oil prices, exchange rate, global economic growth, total world oil reserves and seasonal changes on demand of oil in world are estimated using (Auto Regressive Distributed Lags) ARDL approach for 2000:1 – 2010:12 periods. Results show that global economic growth, total world oil reserves and exchange rate have significant positive on oil demand. Also oil prices have negative effect on dependent variable. Finally seasonal changes have no significant effect on global oil demand.

KEYWORDS: Oil Demand, Seasonal Changes, ARDL, Exchange Rate, Economic Growth.

1. INTRODUCTION

One of the most important resources on the planet today is oil. Indeed, oil is a form of power, not only because it is a primary source of the energy needed to power modern industrialized society (Yergin, 1992), but also because its possession itself is a source of power. Oil not only fuels our cars, heats our homes and runs our factories, but also drives national economic, political and military policy around the world. Oil as the main energy of the universe always was and is of particular importance. Oil is only a valuable and tradable commodity in international trade, among other items and is a strategic commodity. Characteristics of the oil market in the global economy has caused the prices of these goods, along with economic factors will also be affected by political factors. Crude oil prices for oil exporting countries have particular importance and there is no doubt that crude oil prices and supply process and its decisive have key role in the economies of these countries, unfortunately these exogenous factors outside the control over the economy affects everyone. Any reduction in oil prices affects the current earnings of these countries and makes their development programs difficult. Because most oil exporting countries are among the less developed countries and have nature in form of precarious and unstable economic and social conditions.

Although there have been countless empirical studies of the world oil market, not one has produced a satisfactory model that adequately explains historical data, much less accurately predicts future developments. Moreover, the preponderance of these studies was conducted over two decades ago. As a consequence, while frontier econometric methods have been used to estimate the basic economic model of static competitive markets for a variety of commodities, including the demand for fish (Angrist et al., 2000) and the labor supply of stadium vendors (Oettinger, 1999), new methods have yet to be applied to the market for oil.

After this section, in section 2, global oil overview is presented. Methodology and data are delivered in section3. Results will be analyzed in section 4 and finally Conclusion is presented in section 5.

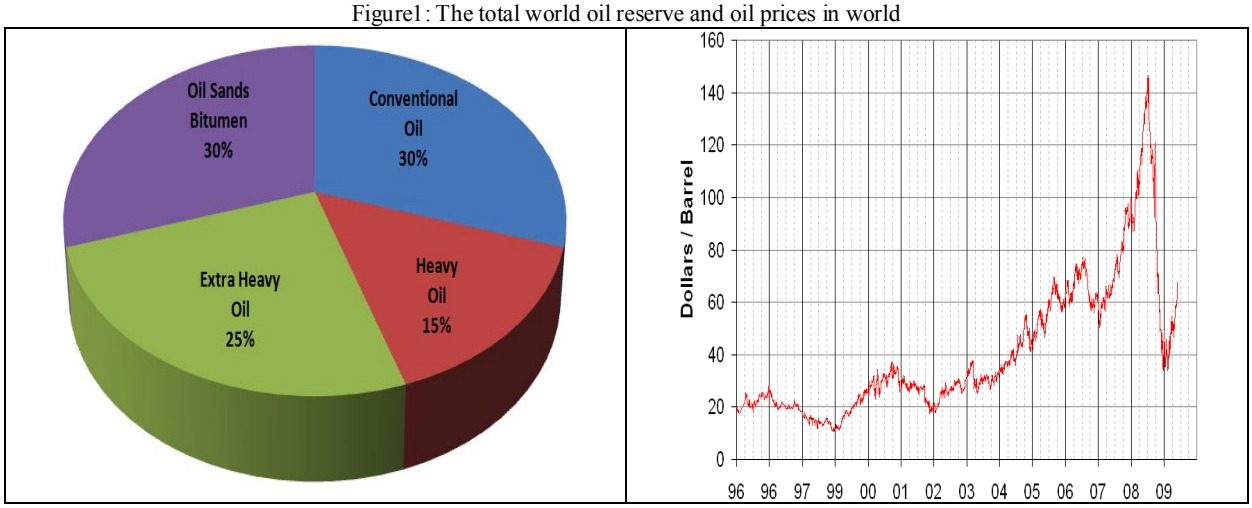
2. Global Oil Overview

The history of oil is understood through rising demand, fears of supply shortage, international security concerns and crises, and mounting profits. In 1948, the United States became a net importer of oil. Seven major companies, "Big Oil," spearheaded the world industry. Of these companies five were American Chevron, Exxon, Gulf, Mobil and Texaco – one was British (British Petroleum), one Dutch (Shell) and one French. The developing countries that owned the vast supply of discovered oil reserves were scattered across the earth: Indonesia, Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. The unparalleled Middle East oil reserves were discovered during this period as well (of the dozen largest oil fields in the world 10 are in the Middle East).The companies proceeded to construct legal and business systems for extracting the oil and controlling supply (Terry, 2009). At the industry's inception, American policy makers expressed concern over both corporate trust violations and security concerns. Dependency

***Corresponding Author:** Ramin Alinejadshahabi, Department of Chemical Engineering, Ahar Branch, Islamic Azad University, Ahar, Iran. E-mail: shamizadehhadi@yahoo.com

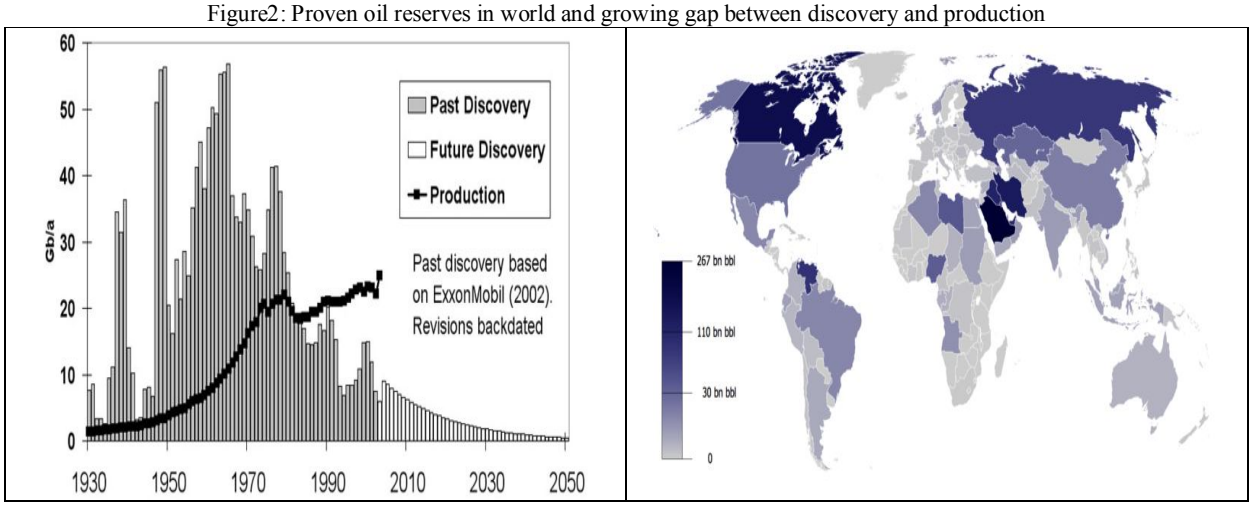
on foreign oil was seen as a security risk even when it only represented 10% of supply in 1948, as opposed to today when it accounts for over 50% of consumption. Security concerns trumped anti-trust litigation, however, and the 5 American companies successfully created an oligopoly in conjunction with the 3 foreign firms. Smaller companies entered the market during the course of history, but never rivaled the scope of the original companies. In response to the growing industry and rising profits, the producing countries began to push back against the oil industry and formed the Organization of Petroleum Exporting Countries (OPEC). OPEC was created in 1960 by Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. Eight other countries later joined OPEC: Qatar (1961); Indonesia (1962); Libya (1962); United Arab Emirates (1967); Algeria (1969); Nigeria (1971); Ecuador (1973) and Gabon (1975). OPEC was slow to develop and had no real bargaining power in the 1960s. In the 1970s, a rising fear of supply shortages began to grip the oil companies (Wright, 2010). America imported one-third of its consumption, while world demand was increasing at a rate of 2-3 mbd per year, and most of this increase would have to come from Middle East oil. OPEC began to demand higher taxes and an increased share of oil profits. The oil companies could have fought viciously against these demands, but were constrained by a number of factors. According to oil historian F. Parra, oil companies lacked both political and public support to fight against the rising demands of OPEC (Parra, 2004). Anxiety about supply shortages also paralyzed the producers. Finally, the industry could pass increased costs onto the consumer and increased prices would permit the development of oil fields outside of the Middle East, such as the North Sea and Alaska. Figure 1 represents the total world oil reserve and oil prices in world.

Figure1 : The total world oil reserve and oil prices in world



In above figure, in left hand the total world oil reserve is provided. In the right hand oil prices is presented. In figure2, proven oil reserves in world and growing gap between discovery and production are presented.

Figure2: Proven oil reserves in world and growing gap between discovery and production



In above figure, in left hand oil reserves in world are provided. In the right hand growing gap between discovery and production presented.

3. DATA AND METHODOLOGY

In this research all data are obtained from WDI (World Development Indicators Software). To test for co integration among the variables in the long run function, various cointegration tests may be used such as the Johansen test (Johansen, 1988) method and the two steps Engle and Granger (1987) approach. The major advantage of the Johansen method is that it allows estimation of multiple cointegrating vectors where they exist. However, its application presupposes that the underlying regressors are all integrated of order one (Pesaran and Shin, 1999) and in the presence of a mixture of stationary series and series containing a unit root, standard statistical inference based on conventional likelihood ratio tests is no longer valid and the Johansen procedure may lead to erroneous inferences. Pesaran and Shin (1999) develop a new ARDL bounds testing approach for testing the existence of a cointegration relationship that is applicable irrespective of whether the underlying series are I(0), I(1). This approach rehabilitates the ARDL framework while overcoming the problems associated with the presence of a mixture of I(0) and I(1) regressors in a Johansen-type framework. An ARDL model is a general dynamic specification, which uses the lags of the dependent variable and the lagged and contemporaneous values of the independent variables, through which the short-run effects can be directly estimated, and the long-run equilibrium relationship can be indirectly estimated. Pesaran and Shin (1999) introduce the bounds test for cointegration that can be employed within an ARDL specification. This method has definite advantages in comparison to other cointegration procedures since it can be employed regardless of whether the underlying variables are I(0), I(1) or fractionally integrated. Thus, the bounds test eliminates the uncertainty associated with pre-testing the order of integration. Secondly, it can be used in small sample sizes, whereas the Engle–Granger and the Johansen procedures are not reliable for relatively small samples (Narayan, 2004). The ARDL approach involves two steps for estimating the long-run relationship. The first step is to examine the existence of a long-run relationship among all variables in the equation under examination. Conditional upon cointegration is confirmed, in the second stage, the long-run coefficients and the short-run coefficients are estimated using the associated ARDL and ECMs. So In this framework, this regression function has been used.

$$LOIL_t = \beta_0 + \beta_1 LGDP_t + \beta_2 LEX_t + \beta_3 LRES_t + \beta_4 LPRICE_t + \beta_5 D_t + \varepsilon$$

In above model, OIL is global oil demand, GDP is world's gross domestic product, EX is exchange rate, RES is world oil reserve, PRICE is oil price and finally D is seasonal changes for oil demand.

4. RESULTS

Before estimation the model, stationary or non-stationary of variables should be determined. Paper starts by testing the hypothesis that each series contains a unit root. For this aim, augmented Dickey-Fuller test is applied that procedure by trying two different tests in which I include trend and intercept in the first test and only an intercept in the second test. Eight lags are entered for each series, and then all insignificant lags using t-statistics are eliminated. These tests are performed on the levels and on the first differences as shown in Table 1.

Table 1: Tests for Stationary

Variable	T-statistics Levels	First Difference	Lags	Classification
Augmented Dickey-Fuller Test				
Test Assumptions: Intercept*				
LOIL	-4.2581	--------	3	I(0)
LGDP	-0.1387	-6.2187	3	I(1)
LEX	-5.3187	--------	3	I(0)
LRES	-2.1784	-7.0374	2	I(1)
LPRICE	-4.1009	--------	3	I(0)
Test Assumptions: Intercept and Trend**				
LOIL	-4.3710	--------	3	I(0)
LGDP	-2.1087	-6.5222	2	I(1)
LEX	-6.3997	--------	3	I(0)
LRES	-2.3741	-7.3361	1	I(1)
LPRICE	-5.3446	--------	1	I(0)

* 5% critical value =-2.958
** 5% critical value = -3.524

Three variables are not stationary in levels. In this step, model has been estimated. Results present in table 2 and 3.

Table 2: Short-run Estimation Result

Variable	Coefficient	t-Statistic and Prob	
OIL(-1)	1.508	7.3918 [.000]	
LGDP	0.055	1.7728 [.098]	
LGDP(-1)	0.089	3.0097 [.009]	
LEX	2.337	2.5553 [.023]	
LEX(-1)	1.931	1.6254 [.126]	
LEX(-2)	-2.482	-2.1074[.054]	
LRES	0.161	3.8539 [.002]	
LPRICE	-0.043	-.86864[.400]	
D	-1.337	-4.5591[.000]	
R-squared	0.99	Durbin-Watson stat	2.10

Table 3: Long-run Estimation Result

Variable	Coefficient	t-Statistic and Prob
LGDP	0.2082	7.3962 [.000]
LEX	3.2841	3.8502[.002]
LRES	2.7195	3.5439 [.003]
LPRICE	-0.0523	-.81094[.431]
D	-1.337	-4.5591[.000]

As we seen, global GDP has significant effect on Oil demand. Exchange rate and oil reserve have significant effects on oil demand also. Oil price has no effect on global oil demand. Finally seasonal changes have negative effect on oil demand in world.

5. Conclusion

Demand for various oil for industrial and transportation sections play more important role. In this research after discussing about oil demand situation in world, we employ many variables affecting oil demand. We shows how world oil demand is affected by global GDP, Exchange rate, oil prices, oil reserves in world and seasonal changes. The empirical results for oil demand in world over the period 2000:1 – 2010:12 shows that global economic growth, total world oil reserves and exchange rate have significant positive on oil demand. Also oil prices have negative effect on dependent variable. Finally seasonal changes have no significant effect on global oil demand.

REFERENCES

- Angrist, J., K., Graddy, and G.W., Imbens (2000): "The interpretation of instrumental variables estimators in simultaneous equations models with an application to the demand for fish", The Review of Economic Studies, 67 (3), 499-527.
- Brandt, A.R. (2007): "Testing Hubbert", Energy Policy, 35 (5): 3074–3088.
- Gylfason, T. (2004): "Natural Resources and Economic Growth: From Dependence to Diversification", CEPR Discussion Papers 4804.
- IFS (2009): "International financial statistics", Washington, D.C.: International Monetary Fund.
- Johnson, C. (2010): "Oil exploration costs rocket as risks rise", Reuters, 9, 320-337.
- Narayan, P.K., (2004): "Reformulating critical values for the bounds F-statistics approach to cointegration: an application to the tourism demand model for Fiji", Department of Economics, Discussion Papers, 02/04, Monash University, Melbourne, Australia.

- Miketa A., and P., Mulder (2005): 'Energy Productivity across Developed and Developing Countries in 10 Manufacturing Sectors: Patterns of Growth and Convergence", Energy Economics, 27, 429-453.
- Oettinger, G.S. (1999): "An empirical analysis of the daily labor supply of stadium vendors", The Journal of Political Economy, 107 (2), 360-392.
- Parra, F. (2004): "Oil Politics: A Modern History of Petroleum", Policy Matters, 21(3), 54-69.
- Pesaran M.H., and Y., Shin (1999): "An autoregressive distributed lag modeling approach to cointegration analysis", Centennial Symposium Cambridge: Cambridge University Press.
- Russell, I.D., and Campoy, A. (2009): "Oil Industry Braces for Drop in U.S. Thirst for Gasoline", The Wall Street Journal, 3(12), 12-35.
- Stern, D.I. (2000): "A multivariate co-integration analysis of the role of energy in the US macro-economy", Energy Economics, 22/2, 267-283.
- Stern, D.I., and C.J., Cleveland (2004): "Energy and Economic Growth", Rensselaer Polytechnic Institute, Working Papers in Economics.
- Terry, M. (2009): "Key oil figures were distorted by US pressure", The Guardian (London), 12(31), 11–2.
- Thomson, R. (2009): "Environmental Challenges of Heavy Crude Oils", Battelle Memorial Institute, Retrieved 11 July, 45-69.
- Wacziarg, R. (2001): "Measuring the Dynamic Gains from Trade", World Bank Economic Review, 15/3, 393-429.
- World Bank (2008): "World Development Indicators 2008", World Bank, Washington, DC.
- World Bank (2010): "World Development Indicators", Online Database.
- Wright, J.C. (2010): "Oil: Demand, Supply and Trends in the United States", University of California Berkeley
- Yergin, D. (1992): "The prize: the epic quest for oil, money, and power", New York: Free Press.