IOSR Journal of Business and Management (IOSR-JBM)
e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 23, Issue 4. Ser. II (April 2021), PP 64-66
www.iosrjournals.org

The Effect of Suez Canal Blockage on Crude Oil Prices: An Event Study Analysis

Mansour S. AlFadhli
Department of Insurance and Banking - College of Business Studies
The Public Authority for Applied Education and Training (PAAET), Kuwait.

Musaed S. AlAli
Department of Insurance and Banking - College of Business Studies
The Public Authority for Applied Education and Training (PAAET), Kuwait.

Hazem A. AlKulaib
Department of Management - College of Business Studies
The Public Authority for Applied Education and Training (PAAET), Kuwait.

Abstract
In 2020 around 4.45% of the world total crude oil imported by seaborne methods went through the Suez Canalmaking this narrow pathway crucial to the crude oil world trade. The aim of this study is to assess the effect of Suez Canal blockage caused bythe container ship Ever Givenon the global price of crude oil during the six days blockage period. Using both mean-adjusted returns model and market model, results showed that there was a significant difference in crude oil returns pre and post Suez Canal blockage. The results indicates the importance of the canal to the worldtrade in general and to the crude oil market in particular.

Key Words: *Suez Canal, Crude oil price, Event study analysis, Abnormal returns,and OLS regression.*

Date of Submission: 25-03-2021 Date of Acceptance: 09-04-2021

I. Introduction

According to the International Energy Agency (IEA) (2020), crude oil was the source of 31% of the world energy consumption in 2019 making it the highest source of energy globally and out of which61% is transported by sea (U.S. Energy Information Administration, 2020). Any disruption in oil supply would have a huge effect on the energy market, especially to countries west of the Suez Canal. On March 23rd, 2021, the container ship Ever Given ran aground and blocked the Suez Canal, one of the world's most vital shipping lanes. Approximately fifty ships per day travel through the 120 mile canal, which accounts for around 12% of total global trade. The vessel was re-floated six days later. During that period of time, the blockage caused a huge disturbance in crude oil supply chain resulting in uncertainty which led to fluctuation in the crude oil prices. The Suez Canal blockage can be seen as an "external shock" where according to Coleman (2012) and Kilian (2014) such shocks can lead to an increase in oil prices either because of a disruption in supply or because of a rise in preventive demand. These shocks can also lead to greater volatility during the crisis, resulted from the uncertainty and instability that affects the market (Zhang et al., 2009).

The blockage of the Suez Canal is also a classic case of "black swan" since it is a very unlikely event that has a severeunfavorable economic consequences. Taleb (2005) defined black swan as a random event that satisfy the following three properties: large impact, incomputable probabilities, and surprise effect.In examining black swan and external shocks effect, event study analysis is the most accepted and widely used method. AlAli (2020) applied event study analysis in examining the effect of WHO Covid-19 announcement on Asian stock markets returns. Draper (1984) used event study analysis to investigate the impact of scheduled and unscheduled OPEC announcements on heating oil market weekly returns. The results indicated significant differences in pre and post event average weekly returns for regularly scheduled meetings, but not for unscheduled ones. Guidi, Russel and Tarbert (2006) used event study methodology to examine the effects of OPEC production increases and decreases on oil prices during the period 1986-2004. They concluded that OPEC production "cut" decisions have a much higher impact on spot oil prices than decisions to "increase" production. Ji and Guo (2015) examined the effect of financial, political and natural events on crude oil prices. Using event study analysis, they found that the impact of the global financial crisis on oil price returns was significantly negative, while the impact of the Libyan war and hurricanes were significantly positive. According to Gordon and Recio (2019)

when they studies the effect of the Ukraine war on crude oil prices, they found that crude oil market tend to assimilate the impact of relevant events very quickly.

II. Research Methodology

Two methods are used in this research to determine abnormal returns. The first method is the mean-adjusted returns as conducted by Brown and Warner (1985) where;

$$ABR_d = R_d - \overline{R_n} \quad (1)$$

$$\bar{R}_n = \frac{\sum_{d=-245}^{-6} R_d}{245} \quad (2)$$

Where R_d is the average return of crude oil price under study at day d, and$\overline{R_n}$ is the average return of the crude oil price during the estimation window (-245,-6).

The second method is Dodd and Warner (1983) and Draper (1984)market model method where it takes the form of CAPM with the commodity index being used to proxy the return on the crude oil price.

$$R_{ct} = \alpha_c + \beta_c R_{mt} + \varepsilon_{ct} \quad (3)$$

Assuming the error term,ε_{ct} , has an expected value of zero, the error term is in fact the abnormal return at *t* in event time in the vicinity of event c denoted as;

$$ABR_d = R_d - (\alpha_d + \beta_d R_{mt}) = \varepsilon_{ct} \quad (4)$$

Where R_{mt} is the return of Dow Jones Commodity Index Crude Oil (DJCICL).$\alpha_d$andβ_d are the coefficients obtained from the OLS regression over the (-245,-6) estimation window.

Data and Empirical Results

This research is based on the average daily returns of crude oil prices. In addition to Dow Jones Commodity Index Crude Oil (DJCICL), all data used cover the period March 30th, 2020 to March 29th, 2021. The data for this research were downloaded from Yahoo-finance website.

From table 1, it can be seen that the average return on actual crude oil prices increased which was due to the uncertainty regarding the flow of oil supplies, but that return was gradually reduced due to the supply of information regarding the time span of the blockage release. One day after the blockage, crude oil prices went up by 6.861% but that return was reduced after 3 days to 1.918% and to 1.016% one day before the vessel was released.

Table 1. Actual Return on Crude Oil Prices

Number of Days	Pre	Post
5	-1.151%	1.016%
3	-1.514%	1.918%
1	0.212%	6.861%

Results of the market model OLS regression are presented in table 2. It can be seen that the regression model has an$AdjR^2$ of 0.2718 indicating thatreturns onDow Jones Commodity Index Crude Oil (DJCICL) can only explain 27.18% of the returns on crude oil prices.

Table 2. Market Model OLS Regression Output

Adj R^2	0.2718	Sig F	000
Standard Deviation	0.188		
Obs	240		
	Coefficient	t-stat	P-Value
Intercept	-0.02197	-1.799	0.0733
Return onDJCICL	1.846	9.499	000

In terms of abnormal returns, it can be seen from table 3, that mean-adjusted return model was closer to the actual returns. The model showed positive abnormal returns while on the other hand the market model showed negative returns and that is due to the low explanatory power of the regression model. The mean-adjusted return model showed 6.86%, 2.86%, and 1.96% abnormal returns while the market model showed -2.82%, 0.57%, and 1.34% abnormal returns for the periods 1, 3, and 5 days respectively. Using t-test to examine equal abnormal returns means pre and post blockage, it can be seen that the hypothesis of equal means was rejected and that there was a difference in mean abnormal retunes in both models indicating that the crude oil market was affected by the blockage.

Table 3. Abnormal Returns and t-test Results

Mean-Adjusted Return Model				
Event Window	Before	After	After-Before	t-test
-5,5	-0.21%	1.96%	2.17%	0.742
-3,3	-0.57%	2.86%	3.43%	0.603
-1,1	1.15%	6.86%	5.71%	N/A
Market Model				
-5,5	3.20%	1.34%	-1.86%	-0.763
-3,3	3.50%	0.57%	-2.93%	-0.616
-1,1	2.05%	-2.82%	-4.87%	N/A

*,**,*** represent the confidence level at the 90%, 95, and 99% levels respectively

III. Conclusion

Suez Canal is one of the most important canals that links east to the west, approximately 12% of the world trade goes through this 120 mile canal. This study was designed to examine the effect of Suez Canal blockage on the crude oil prices. Using mean-adjusted returns and market model methods, results shows positive effect of the blockage on crude oil returns resulting in higher oil prices during the six days blockage period and significant difference between crude oilabnormal returns before and after the blockage.

References

[1]. AlAli, Musaed. (2020).The Effect of WHO COVID-19 Announcement on Asian Stock Markets Returns: An Event Study Analysis,*Journal of Economics and Business*, 3(3), 1051-1054. https://doi.org/10.31014/aior.1992.03.03.261

[2]. Brown, S.J., Warner, J.B. (1985). Using daily stock returns: The case of event studies, *Journal of Financial Economics*, 14(1), 3-31.https://doi.org/10.1016/0304-405X(85)90042-X

[3]. Coleman, L. (2012). Explaining crude oil prices using fundamental measures,*Energy Policy*, 40, 318-324.https://doi.org/10.1016/j.enpol.2011.10.012

[4]. Dodd, P., Warner, J.B. (1983). On corporate governance: A study of proxy content, *Journal of Financial Economics*, 11(1-4), 401-438.https://doi.org/10.1016/0304-405X(83)90018-1

[5]. Draper, D.(1984). The Behavior of Even-Related Returns on Oil Futures Contracts,*Journal of Futures Markets*, 4(2), 125-132.

[6]. Gordon, A. and Recio, L. (2019). External Effects of the War in Ukraine: The Impact on the Price of Oil in the Short-term, *International Journal of Energy Economics and Policy*, 9(2), 267-276. https://doi.org/10.32479/ijeep.7380

[7]. Guidi, M.G.D, Russel, A. and Tarbert, H. (2006). The effect of OPEC policy decisions on oil and stock prices,*OPEC Review*, 30(1), 1-18. https://doi.org/10.1111/j.1468-0076.2006.00157.x

[8]. International Energy Agency (IEA) (2020). Global Energy Review 2019, available at: https://www.iea.org/reports/global-energy-review-2019

[9]. Ji, Q. andGuo, J. (2015). Oil price volatility and oil-related events: An Internet concern study perspective,*Applied Energy*, 137, 256-264.https://doi.org/10.1016/j.apenergy.2014.10.002

[10]. Kilian, L. (2014). Oil price shocks: Causes and consequences,*Annual Review of Resource Economics*, 6(1), 133-154.https://doi.org/10.1146/annurev-resource-083013-114701

[11]. Taleb, N. (2005). The Black Swan: Why don't we learn that we don't learn? : Random House: NY.

[12]. U.S. Energy Information Administration (2020), available at: https://www.eia.gov/international/data/world#/?

[13]. Zhang, X., Yu, L., Wang, S., and Lai, K.K. (2009). Estimating the impact of extreme events on crude oil price: An EMD-based event analysis method,*Energy Economics*, 31(5), 768-778.https://doi.org/10.1016/j.eneco.2009.04.003

Mansour S. AlFadhli, et. al. *"*The Effect of Suez Canal Blockage on Crude Oil Prices: An Event Study Analysis.*"IOSR Journal of Business and Management (IOSR-JBM)*, 23)04(, 2021, pp. 64-66.