

OPEC's production announcements: The effect they have on stock market returns for the United States and Texas' oil sector

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Introduction

Since the beginning of the 21st century many scholars have continued conducting a multitude of studies on the effects that the announcements by the Organization of the Petroleum Exporting Countries has had on the global financial markets. The most beneficial literature in the research over this topic is the work done with event study methodology over the impact of announcements by OPEC to the financial markets.

For instance, in Guidi et al. (2006) they decided to study if the US and UK stock markets are efficient when OPEC makes a decision to “cut”, “maintain”, or “hike”. In doing this they find that in non-conflict periods the stock market for both countries is efficient with US proving to be more efficient than the UK. But during conflict periods they have an asymmetric reaction to OPEC's announcements, which shows a lack of efficiency during these times.

The next article that resulted in important information was Demirev and Kutan's (2010) research where they found positive significant abnormal return (CAR) differences when OPEC cut production after an announcement, some significant abnormal return (CAR) difference when OPEC maintained production and no significant abnormal return when OPEC increased production.

In the same year Lin and Tamvakis (2010) also had an event study where they compared OPEC's announcements on a diversity of different oil grade qualities. Although they did not find any difference between the different grades of oil their research did find that the evidence showed that the effect of the announcements depended upon production quotas and price trends.

Through out all these scholar's researches it seems that most of them all depend on what decisions are made by OPEC (cut, maintain, or increase) and the Brent crude oil index which determines the global effects on crude oil by OPEC. For the purposes of this research I have limited the data down to United States and Texas areas by using historical data over WTI crude oil spot price and oil companies that operate mainly in Texas to create indices. These indices will help narrow down and compare crude oil stock return for United States and Texas regions.

The objective of the this project is to determine whether OPEC's production announcements have a negative or positive effect on stock market returns for the United States and Texas region during Jan. 2001- Dec. 2015 and whether they can manipulate the market with these announcements. Completing this project will provide important research to add to the existing literature over event study methodology and also about the correlation between OPEC's announcements and crude oil's stock market returns for the US market and Texas companies.

Discovering this information from my research can hopefully show the negative or positive effect from OPEC's announcement decisions towards US and local communities during Jan. 2001- Dec. 2015. With this knowledge oil dependent community leaders can then decide if diversifying the industries the community rely on is in the best interest of the city.

Method

The data gathered for this research was from a number of reputable sites. The first being obtained on OPEC's official site for the announcement day history located in the OPEC bulletin. Next sites used were the United States Energy Information Administration for the historical WTI crude oil spot price and also Yahoo Finance for the historical company stock prices.

1. After downloading the information from the Energy Information Administration and importing to a Microsoft Excel worksheet I was then able to purge the data and calculate an index return for the United States by using the WTI spot price with a simple formula (NEW Spot Price - Old Spot Price)/ Old Spot Price).
2. I then located five companies on Yahoo Finance that are headquartered and operate mainly in Texas and use the price weighted method to create the index for the Texas region. Using the same formula implemented for WTI we then calculate the return for the Texas region.
3. With both indices complete for the period of January 2001-December 2015 we pinpoint and mark each announcement day and record whether the the announcement was to cut, maintain, or increase production.
4. Similar to Lin and Tamvakis (2010) we use a 20 day event window to calculate average return. We apply this window by summing up the daily returns for ten days before and ten days after the OPEC announcement. Then we calculate average return for before announcement by dividing the before sum by 10 and also calculate the after announcement by dividing the after sum by 10. This process will be done for both the WTI returns and the Texas returns.
5. After finding the average returns we then organize the new data into three separate worksheets depending on cut, maintain, or increase announcements. Also we organize the data into four categories within each worksheet that include before and after the announcement for each index (US and Texas).
6. We then sum up each column and divide the sum by the total number of announcements made for each production decision for a cumulative average return to determine whether OPEC's production announcements have a negative or positive effect on stock market returns for the United States and Texas region during Jan. 2001- Dec. 2015

In doing this we can assess the magnitude that OPEC's announcements have on daily returns during the period of Jan. 2001- Dec. 2015. It is also important to realize that this project did not examine stock market return changes based off of the amount of production change that was announce but just the direction of the change (Cut, Maintain, Increase).

Results

Increase Production Announcement Returns

Announcement Date	TEXAS Before	TEXAS After	US Before	US After
12/12/02	0.756766805	-0.322953112	0.184965574	1.507154955
1/13/03	-0.364981647	-0.12930289	-0.278026854	0.232733749
6/3/04	0.221088331	0.76083008	-0.020745264	-0.134317904
9/15/04	0.450764035	0.633947791	0.558731982	1.237174071
3/16/05	0.072658962	0.082609677	0.642769412	-0.098205894
6/15/05	0.579076806	0.128945905	0.584796379	0.316650364
9/20/05	0.658498477	-0.296120719	0.081564781	-0.367289314
9/11/07	0.357194895	0.592754896	0.862310856	0.391519791
(Increase) Total Avg	0.341383333	0.181338954	0.327045858	0.385677477

Figure 3: When an increase production announcement is made on average the stock return will decrease for Texas but increase for United States.

Maintain Production Announcement Returns

Announcement Date	TEXAS Before	TEXAS After	US Before	US After
6/5/01	-0.470613107	-0.912010334	-0.591309063	-0.112410473
9/27/01	-2.541976075	1.799781868	-1.918569195	0.321795977
3/15/02	0.557002306	0.26337186	1.1827334	0.929350831
6/26/02	0.674339222	-0.876464081	0.75331819	0.306929863
9/18/02	0.104025017	0.589126879	0.483122029	0.348566522
3/11/03	-0.104860886	-0.166196738	0.001083208	-0.745814605
6/11/03	-0.163397087	-0.374629543	0.841647303	-0.133237424
7/31/03	-0.171737994	0.442067616	-0.146676201	0.121047744
12/4/03	0.397814615	0.816294483	-0.322226649	0.783467503
1/31/05	0.510117005	0.452400346	-0.186983092	-0.143952915
12/12/05	0.108532421	-0.559493882	0.19327517	-0.526310712
1/31/06	0.526758456	-1.244771019	0.700401104	-1.279048718
3/8/06	-0.583884989	-0.005817645	0.079868454	0.014800454
6/1/06	-0.086507012	-0.272677527	0.297606073	-0.029752481
9/11/06	-0.552795054	-0.359884349	-0.820019154	-0.719004317
3/15/07	0.072139188	0.623820299	-5.933907797	1.416889691
12/5/07	-0.165543438	0.350585333	-0.78429621	0.436884916
2/1/08	-0.245264475	0.417561511	0.103385499	0.726309988
3/10/08	0.439608385	-0.031951279	0.618672574	-0.550921597
9/10/08	-1.551685571	0.590271202	-1.042343278	0.689232796
3/16/09	0.513015432	0.391815146	0.653421747	0.317084776
5/28/09	-0.226421605	0.655279373	0.78096236	1.134140496
9/10/09	0.240923985	0.307612373	-0.023610916	-0.86324106
12/22/09	0.78281216	0.508699828	-0.149061734	1.184618699
3/17/10	0.235245558	-0.076637921	0.272538996	0.071893105
10/14/10	0.723196729	-0.301606586	0.65696179	-0.039394685
12/13/10	0.759694168	0.117795353	0.470546893	0.319875724
6/8/11	-0.004788487	-0.112404138	0.225659174	-0.571090851
12/14/11	-0.090589423	0.530899455	0.053103602	0.500485847
12/12/12	0.102791611	-0.020375601	-0.162943186	0.523540603
5/31/13	0.287530521	0.262774411	-0.035976165	0.626283267
12/4/13	-0.226405505	-0.32585734	0.304258813	0.066390751
6/11/14	0.529524044	0.342016472	0.026059088	0.191960599
11/28/14	-0.463448192	-0.768763638	-0.442003834	-1.272746299
6/5/15	-0.141348674	-0.394140796	-0.137163273	0.098206823
12/4/15	-0.286930004	-1.40929998	0.100351096	-1.37315691
(Maintain) Total Avg	-0.014253521	0.034699761	-0.108280922	0.076936804

Figure 2: When a maintain production announcement is made on average the stock return will increase for both Texas and United States.

During the period of January 2001-December 2015 the price for crude oil have fluctuated for a number of reasons including but not limited to wars, natural disasters, human errors, etc. Even with these factors the stock market will continue to operate. In this study we are solely focused on the market returns on crude oil for the United States region and Texas sub-region of the industry when an Organization of the Petroleum Exporting Countries (or OPEC) announcement is made. As discussed in the method portion of this poster we calculate a index for both the United States and Texas area.

After calculation we find that when OPEC makes an announcement to increase production the total average returns from before the announcement is made causes a drop to the sub-region of Texas. This means that on average when OPEC increases production Texas companies stock prices tend to drop. But inversely when the announcement for and increase is made the companies that are more diversified out of Texas' oil shell area in the United States gain value to their stock price.

Next we look at when OPEC decides to announce a maintain in production. For both the Texas area and United States area the return data shows that these companies stock price will increase more often then not when such an announcement is made.

Finally we observe the occasions when OPEC decides to announce a cut in production. When this announcement is made we can see a significant increase in stock prices for oil companies in both the United states and the Texas sub-region.

Cut Production Announcement Returns

Announcement Date	TEXAS Before	TEXAS After	US Before	US After
1/17/01	-0.539088966	-0.205341065	1.035890068	-3.530050612
3/16/01	0.1206712	-0.231314137	-0.432723519	-0.09404593
7/3/01	-1.261767947	-0.816107434	-0.548020025	-0.615843133
11/14/01	0.020231463	-0.251819716	-0.075894253	0.033537937
4/24/03	0.256308314	-0.233463517	0.096216937	-0.172652399
9/24/03	0.094070672	0.176861741	-0.780368337	0.499760648
2/9/04	-0.784327874	0.0927819	-0.709413402	0.864989623
3/31/04	0.100732473	0.434525869	-0.309322513	0.568052848
12/10/04	-0.477809949	0.046808223	-1.339791308	0.184232047
10/20/06	0.727201441	0.269201551	-0.235535972	0.324006041
12/14/06	-0.230402303	-0.621096948	-0.175878665	-0.257555955
10/24/08	0.30222605	1.312075586	-2.383066695	-0.206486829
12/17/08	0.995591125	0.646473061	-0.564533132	1.755406701
6/14/12	-0.161100877	-0.257243793	-0.601671634	-0.733960596
(Cut) Total Avg	-0.059818941	0.025881523	-0.501722318	-0.098614972

Figure 1: When a production cut announcement is made on average the stock return will increase for both Texas and United States.

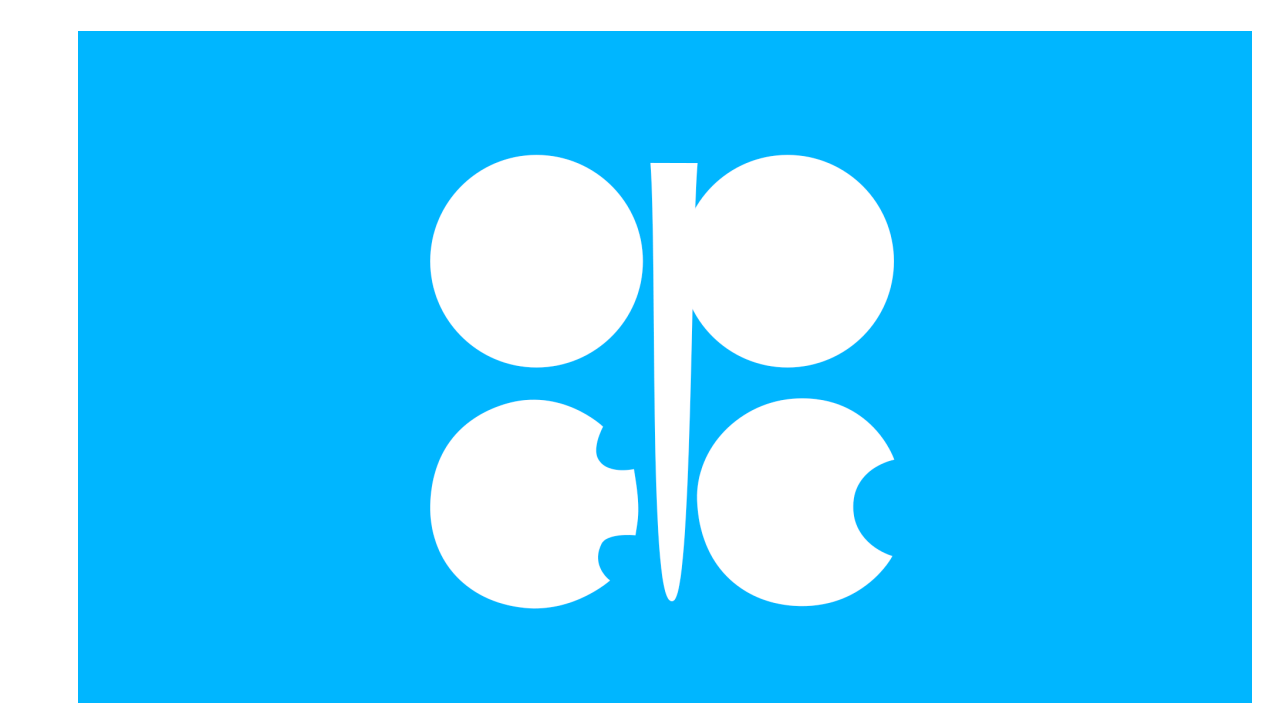
Further Information

Thank you for your time and I can be contacted for more information about this research project at the following email address.

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Conclusion

This research builds on the existing literature of using event study methodology to investigate the effects of OPEC's announcements on crude oil stock market returns. While there are still many factors that can sway the price of crude oil to be a volatile commodity such as wars, natural disasters, acts of terrorism, human errors, etc. The use of the event study methodology has shown that we can measure to a degree of accuracy that OPEC's announcements do affect crude oil stock market returns. When they decide to increase production they affect the supply of crude oil globally causing a surplus which in turn will lower prices to find a natural equilibrium. According to my results Texas companies take a large hit when this happens. Most likely due to the price of operation in the area compared to companies that are more diverse with operations throughout the country and globe. When OPEC decides to announce no change (maintain) or cut in production companies around both United States and Texas area benefit from the announcement and see a rise in their stock returns. This occurs because OPEC has not manipulated the supply side of supply and demand economics and have allowed the market to find a natural equilibrium. After running the results it is apparent to me that OPEC's announcements do manipulate the market by changing the supply of oil and that there is a negative correlation present between the announcements and crude oil stock returns.



Literature Cited

- Demirev, R., & Kutan, A. M. (2010). The behavior of crude oil spot and futures prices around OPEC and SPR announcements: An event study perspective. *Energy Economics*, 32(6), 1467-1476. doi:10.1016/j.eneco.2010.06.006
- Energy Information Administration: WTI Spot Prices. (n.d.). Retrieved February 20, 2016, from <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=D>
- Guidi, M. G., Russell, A., & Tarbert, H. (2006). The effect of OPEC policy decisions on oil and stock prices. *OPEC Review*, 30(1), 1-18. doi:10.1111/j.1468-0076.2006.00157.x
- Lin, S. X., & Tamvakis, M. (2010). OPEC announcements and their effects on crude oil prices. *Energy Policy*, (38), 1010-1016. Retrieved February 12, 2016, from www.elsevier.com/locate/enpol.
- OPEC Bulletin. (n.d.). Retrieved February 20, 2016, from http://www.opec.org/opec_web/en/76.htm
- Yahoo Finance - Business Finance, Stock Market, Quotes, News. (n.d.). Retrieved February 20, 2016, from <http://finance.yahoo.com/>

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