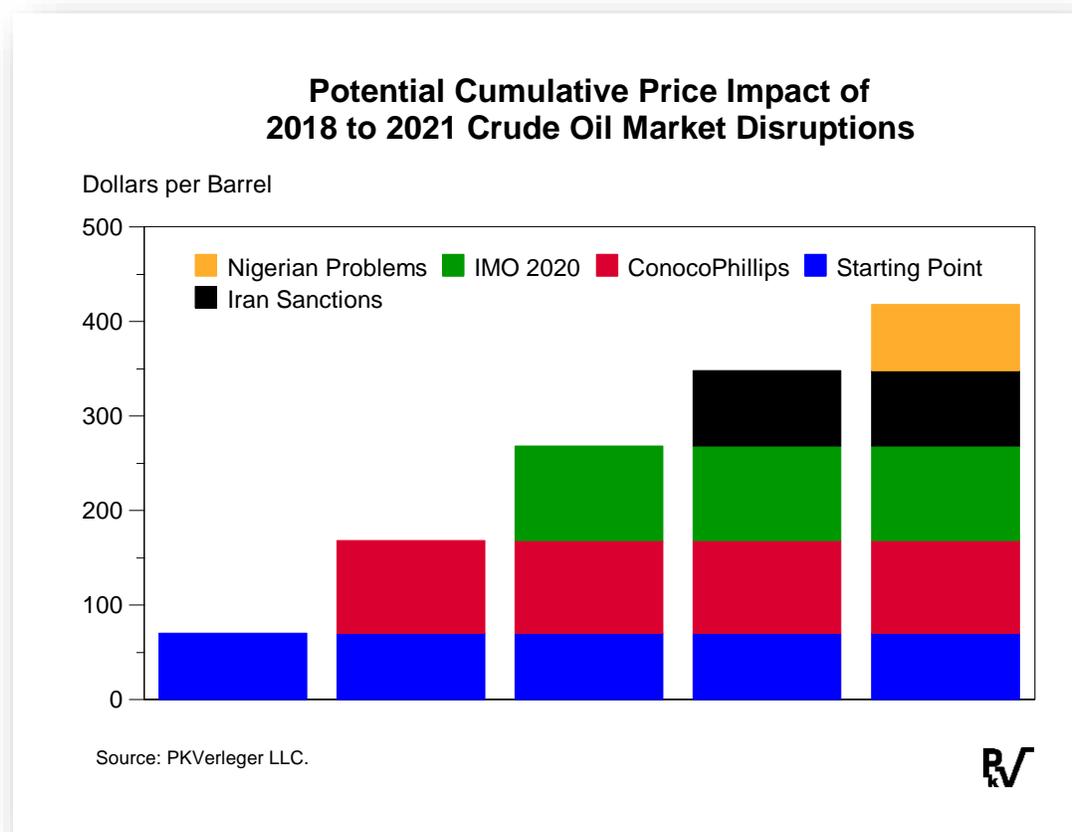


Understanding Price Behavior During Oil Market Disruptions



Publication Date: 5/24/2018

Table of Contents

Summary	1
Understanding Price Behavior During Oil Market Disruptions	4
Estimating the Price Impact of Disruptions	15
Predicting the Impact of Coming Disruptions.....	19
ConocoPhillips' Seizure of Venezuelan Assets.....	19
The IMO 2020 Regulations.....	22
Additional Disruptions.....	26
Conclusion: \$300 or \$400 per Barrel Crude	30
Glossary.....	32
Statistical Appendix	34

List of Figures

Figure 1. Crude Oil Output of Key Middle Eastern Producers, 1948 to 1960	5
Figure 2. Percentage Oil Price Increase in 20 Market Disruptions vs. Price Increase Predicted by Key Market Characteristics	6
Figure 3. Commercial Crude Oil and Product Inventories in OECD Pacific Nations, 1975 to 1984.....	12
Figure 4. Crude Oil Days of Supply Held in OECD Countries, January 1988 to December 1992.....	13
Figure 5. Change in Global Crude Oil Consumption from Third Quarter to Fourth Quarter, 1985 to 1995.....	14
Figure 6. Percentage Oil Price Increase in 19 Market Disruptions vs. Price Increase Predicted by Key Market Characteristics	17
Figure 7. Gasoil-to-Gasoline Premium/Discount vs. Dated Brent Price, 1985 to 2020.....	25
Figure 8. Iranian Crude Oil Production and Exports, 2000 to 2018	27
Figure 9. Distillate Fuel Oil Production from US PADD III Refineries, 2005 to 2018	28
Figure 10. Nigerian Crude Oil Production, 1981 to 2018	28
Figure 11. Speculative Positions in Product and Crude Futures: Long Positions of Money Managers in Principal Futures Contracts and Options Equivalents, 2007 to 2018.....	29
Figure 12. Potential Cumulative Price Impact of 2018 to 2021 Crude Oil Market Disruptions.....	30

List of Tables

Table 1. Effects and Durations of Nineteen Oil Market Disruptions	11
Table 2. Output Increases from UAE and Saudi Arabia in Response to Production Shortfalls	15
Table 3. Results of Regression on Price Changes Occurring During Disruptions	17
Table 4. Actual Price Impact of Crude Oil Market Disruption vs. Predicted Price Impact...	18
Table 5. Projection of Global Crude Oil Production in 2018.....	22
Table 6. Shift between High-Sulfur Bunker Fuel Oil and Low-Sulfur Distillate Use: 2016 vs. Projected 2020.....	23
Table 7. Refining Margins During the 2008 Distillate/Diesel Squeeze	25

Summary

One of the most famous economic statements ever written comes at the end of Milton Friedman and Anna Schwartz' study of the economic policy failures that caused the Great Depression:

...economic collapse often has the character of a cumulative process. Let it go beyond a certain point, and it will tend for a time to gain strength from its own development as its effects spread and return to intensify the process of collapse. Because no great strength would be required to hold back the rock that starts a landslide, it does not follow that the landslide will not be of major proportions.¹

These words apply to incidents variously referred to as oil market disruptions, oil price spikes, or oil market squeezes. Such events are a relatively recent development. None of importance was reported before 1970. Oil consumers were seemingly well-supplied, except during war, from the turn of the twentieth century to 1973. Credit for the stability goes to the multinational oil companies that maintained a steady flow of oil even when confronted with problems in one part of the world or another. These companies, while despised by those such as the late John Blair, author of *The Control of Oil*,² managed crude oil distribution in ways that moderated price fluctuations before 1973.

The majors' control of oil ended, though, in 1973 following the Arab Embargo, the first and, percentage-wise, largest disruption ever. In the subsequent forty-five years, at least nineteen market disruptions have occurred. Prices have risen twelve to two hundred thirty percent in these episodes. In some instances, the price increases have been transitory; in others, permanent.

This issue of *The Petroleum Economics Monthly* provides a detailed analysis of market behavior during the various disruptions, starting with the 1973 embargo. The next issue will examine the economic impact of price increases with a focus on consumers.

The discussion here is based on research first published in 1983 in *Oil Markets in Turmoil (OMT)*.³ *OMT* analyzed market behavior during the 1973 embargo, the collapse of production in Iran, subsequent actions by Saudi Arabia to tighten the market after Iran's Shah was deposed, the taking of hostages at the US embassy in Tehran, and finally the outbreak of war between Iraq and Iran. For this work, a simple stylized model was developed using the available data (there were no published spot crude prices) to predict the oil price increase that would occur following a market disruption.

Here, we extend the *OMT* model to cover the nineteen disruptions that have occurred over the last four decades. These include two actions by OPEC to cut production, several disruptions that contributed to the price increases in 2008, four hurricanes, Iraq's invasion of Kuwait, and two separate collapses of Libyan production. In doing so, we found that our simple

¹ Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867-1960* (Princeton, NJ: Princeton University Press, 1963), p. 419.

² John M. Blair, *The Control of Oil* (New York: Pantheon Books, 1976).

³ Philip K. Verleger, Jr., *Oil Markets in Turmoil: An Economic Analysis* (Cambridge, MA: Ballinger Press, 1983) [<https://tinyurl.com/y7z44kr>].

statistical model, which ties price changes to changes in production and inventory levels, continues to work well.

We undertake this effort in 2018 because the world oil market will experience two major disruptions and possibly one other over the next three years. The certain disruptions ahead will stem from the following factors:

- The court-sanctioned seizure by creditors of Venezuela's Caribbean assets. The action will force Venezuela to cut its crude production dramatically.
- The requirement, effective in 2020, that sulfur content of ship bunkers be cut to 0.5 percent. This International Maritime Organization regulation will boost demand for light sweet crude, possibly creating a disruption worse than the one witnessed in 2008.

A third disruption might be caused by the United States' aggressive reinstatement of sanctions on Iran. The act will force current buyers of Iranian crude to seek alternative supplies, which could push up crude prices. The advanced announcement of this action may also lead to hoarding.

In addition, the market may face other minor disruptions. Nigerian and Libyan oil output, for example, is always uncertain. In fact, Nigerian exports were interrupted in mid-May for reasons yet to be explained. Libyan output remains unsure due to the country's ongoing civil war. Finally, US production and exports are always vulnerable to hurricanes hitting the Gulf of Mexico, Louisiana, and Texas.

Disruptions usually have led to price increases, although consuming countries hold strategic stocks they could theoretically deploy to offset supply losses. (This has never happened in an effective way.) Oil-exporting countries could also replace lost supply using their excess productive capacity, but, as shown in this report, they rarely have increased output sufficiently to mitigate a disruption fully. These nations view disruptions as opportunities to "cash in" or raise income. Over the last forty-five years, oil ministers have issued the following statement or ones very much like it in response to every disruption:

"The oil market remains well-supplied, with the recent price rise driven by geopolitics, not fundamentals."

Indeed, one can find the same sentence in publications of Argus Media and Platts and in *Petroleum Intelligence Weekly*, *The Wall Street Journal*, *The New York Times*, *Financial Times*, and many other papers and periodicals printed in 1980, 1990, 2008, 2013, 2014, and on the occasion of other disruptions. These words appeared most recently in May 2018.

One suspects this boilerplate text is included in a public-relations handbook given to oil ministers by OPEC. Sadly, officials in consuming governments have similar talking points, which they often supplement by announcing they will do nothing to stop price rises. More specifically, the consuming governments' often-heard response to disruptions goes something like this example:

"The U.S. Department of State remains in contact with our partners to reduce the risk of supply disruptions. There is sufficient oil supply in the global market that countries can access."

Unfortunately, policy officials rarely mention, if they think about it at all, the impact of market disruptions on oil prices. This report concludes that the three disruptions described above collectively could raise crude oil prices to the astounding level of \$400 per barrel. While this seems absurd today, the history of commodity markets is replete with examples where prices rose to unheard-of levels during exceptional market disruptions.

The stage is set for such a disruption given the collapse of Venezuelan output, the potential effect of renewed sanctions on Iran, and the IMO marine fuel sulfur regulation. One can only hope consuming nations here our message and act early action to moderate oil price rises. Absent this, the economic consequences, discussed in the next issue of *PEM*, will likely be traumatic, especially given the aggressive action being contemplated by the United States toward the rest of the world.