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"THE DAY OIL MARKETS REACTED TO OMICRON"

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The Day Oil Markets Reacted to Omicron

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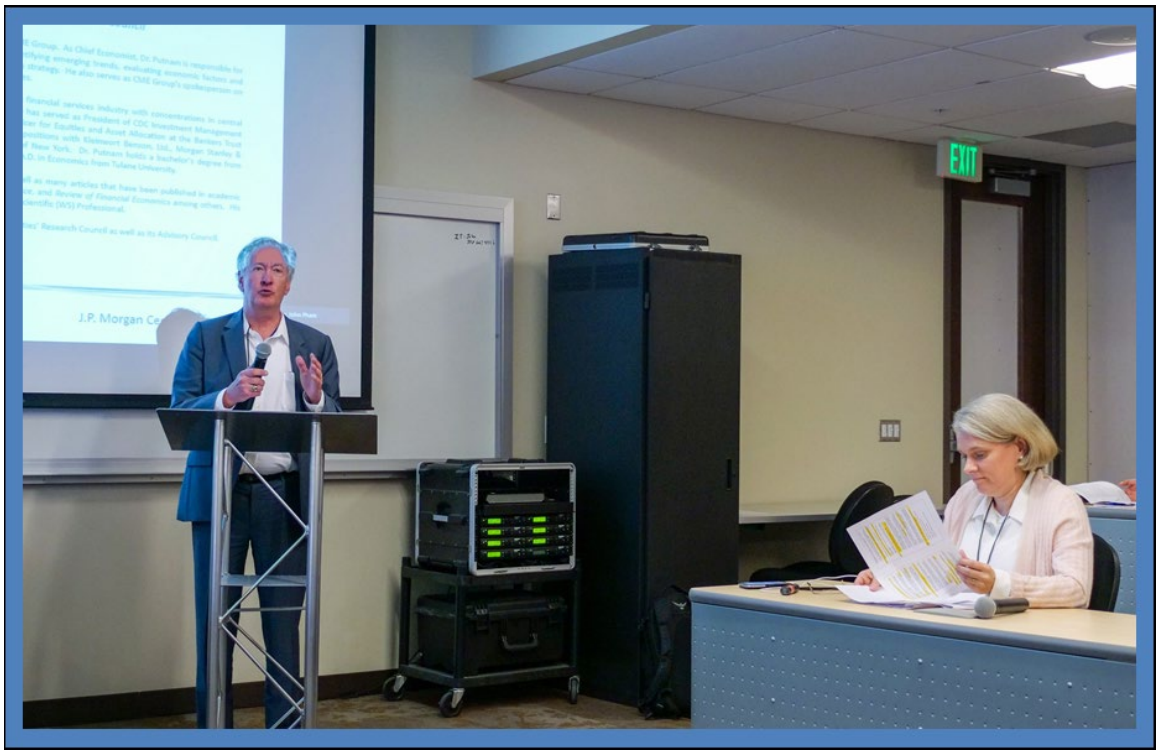


Dr. Bluford Putnam, Ph.D., Chief Economist at the CME Group, presenting at an industry panel during a J.P. Morgan Center for Commodities' international commodities symposium held at the University of Colorado Denver Business School. To Dr. Putnam's right is Hilary Till, the *GCARD*'s Contributing Editor, who moderated the panel.

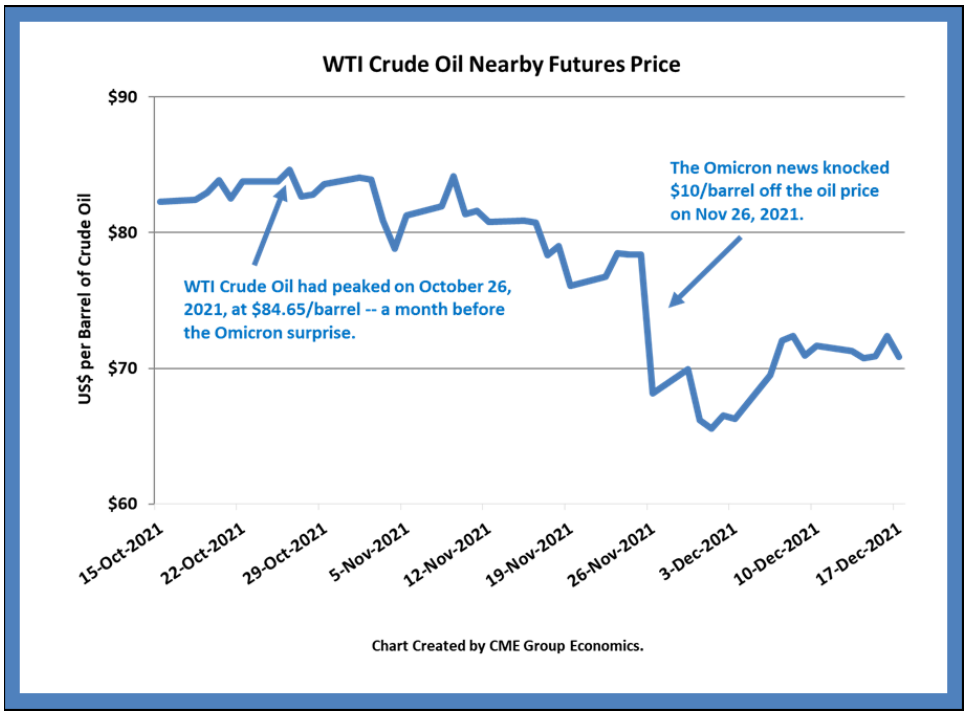
News of the arrival of the Covid-variant named Omicron began to spread on November 25, 2021, a Thursday and notably the Thanksgiving Day holiday in the United States, which meant U.S. futures markets were closed. They opened the next trading session at 5:00pm U.S. Central Standard Time (i.e., CST, Chicago time) on the Thanksgiving afternoon for a holiday-shortened day ending at 12:45pm CST on Friday, November 26, 2021. The Friday after a Thursday holiday is typically a very light volume day, as many traders follow the French tradition of "le pont" – by taking the day off as "the bridge" to the weekend. With the surprise Omicron news, the Friday, November 26, 2021, trading session was extremely active. Our research interest is to examine the trading activity on a typically low-volume day to observe how the futures markets reacted to the surprise news of a new Covid variant that was expected to be highly contagious and spread rapidly.

Oil Markets Were Impacted the Most

For the trading session on Friday, November 26, 2021, the active WTI crude oil futures contract was the January 2022 maturity date. The oil futures price opened at $78.39/barrel and closed on the Friday session at $68.15, a $10 drop, or about a 13% decline in the trading session; see Figure 1. The S&P500® futures contract also dropped 2.2%; see Figure 2 on the next page.

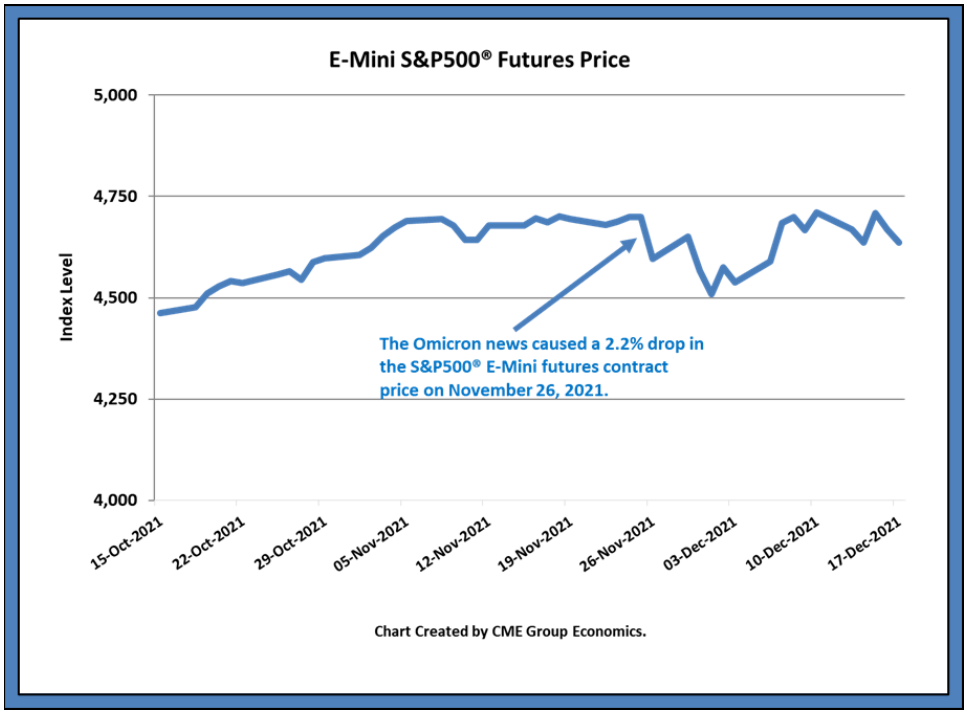
Context matters, and it is important to note a couple of things about why the oil market was more highly impacted than equities or bonds. First, oil is largely used as a transportation fuel in its refined state. Consequently, when the Omicron virus news hit, the conclusion many traders reached very quickly was that the budding signs of a recovery in international travel would be reversed. Second, oil prices were already in a modest decline, having declined by $6/barrel from an October peak of $84.65. When uncertainty hits a market that already has downward momentum pressure, the resulting price slide can be exacerbated.

Figure 1



Source: Bloomberg Professional (WTI Oil Futures = CL1).

Figure 2



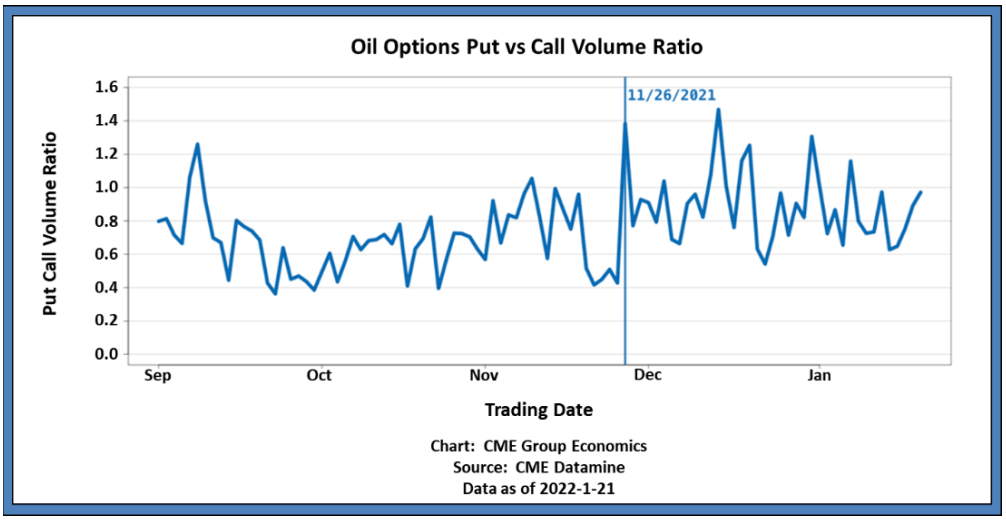
Source: Bloomberg Professional (ES1).

Not Just an Increase in Volatility, but a Downward Price Gap, Too

One might be tempted to view the Omicron news as causing an increase in market volatility. Certainly, looking backwards, the typical standard deviation measure of price volatility showed a rise. But that simplified interpretation ignores the importance to market participants, especially options market participants, of an unexpected price gap.

Options traders monitor the implied volatility of the markets they trade with great scrutiny. The challenge related to price gaps is that the versions of the Black-Scholes-Merton options pricing models[1] that are typically used for implied volatility calculations have an embedded assumption of continuous price movements – that is, the possibility of discreet price gaps are explicitly assumed not to exist. This assumption makes the mathematics of the options pricing model much easier, but it can be hazardous to the health of a risk manager. For anyone using a delta-hedging strategy related to options positions, price gaps can cost considerable money if the gap goes in the wrong direction related to the underlying options positions that is being risk-managed through delta-hedging in the futures markets. As a consequence, a surprise price gap[2] is likely to be accompanied by an asymmetry in options trading with elevated activity on the side of the options market that is being impacted – in this case with a downward price gap, we would expect outsized trading activity in put options. Indeed, this is what occurred; see Figure 3 on the next page.

Figure 3
Put versus Call Options Volume



Bid-Ask Spreads Initially Widened, Then Narrowed

Liquidity is often measured by bid-ask spreads, and one would expect that a news event would result in wider bid-ask spreads. This is what happened in oil futures markets when the Omicron news broke; however, the intra-day pattern is highly informative.

Remember, when thinking about liquidity, we are dealing with a typically light-volume day after the Thursday Thanksgiving holiday in the U.S. What we observed in the Omicron news trading session was that bid-ask spreads were wider than usual, during the first part of the trading session; however, they narrowed considerably in the second half, before rising at the end of the session, which is quite common in many markets, not just oil, especially ahead of a holiday weekend.

The Data Science team at CME Group closely monitors liquidity and how the bid-ask spread can impact the cost of trading.[3] The cost to trade different lot sizes is analyzed separately. One usually would expect small trading lots, say one to three contracts, to be less impacted than larger trade sizes. In this case we provide examples for three-contract lot size and for 10-contract lot size to show the difference – or in this case the similarities in Figures 4 and 5 respectively on the next page.

Figure 4
Cost to Trade 3 Lots

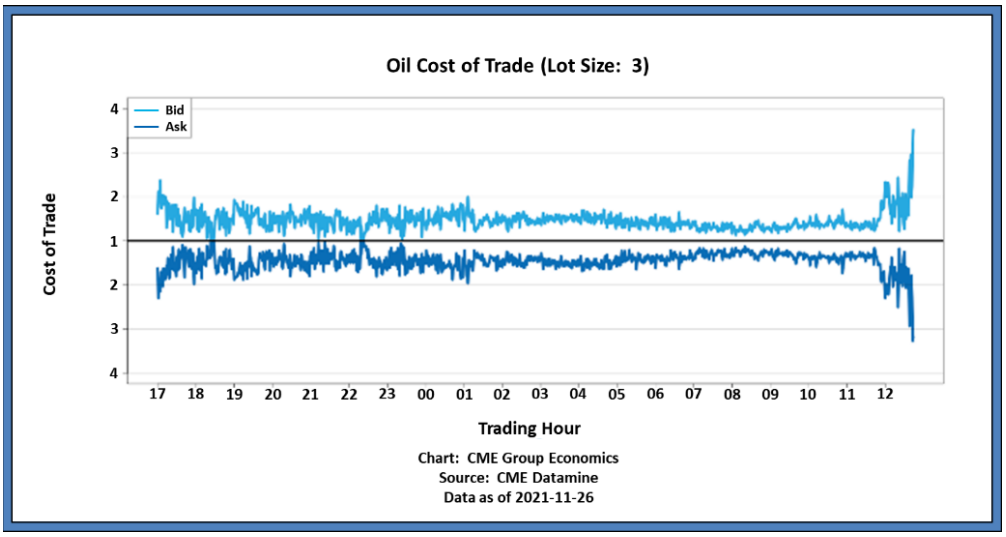
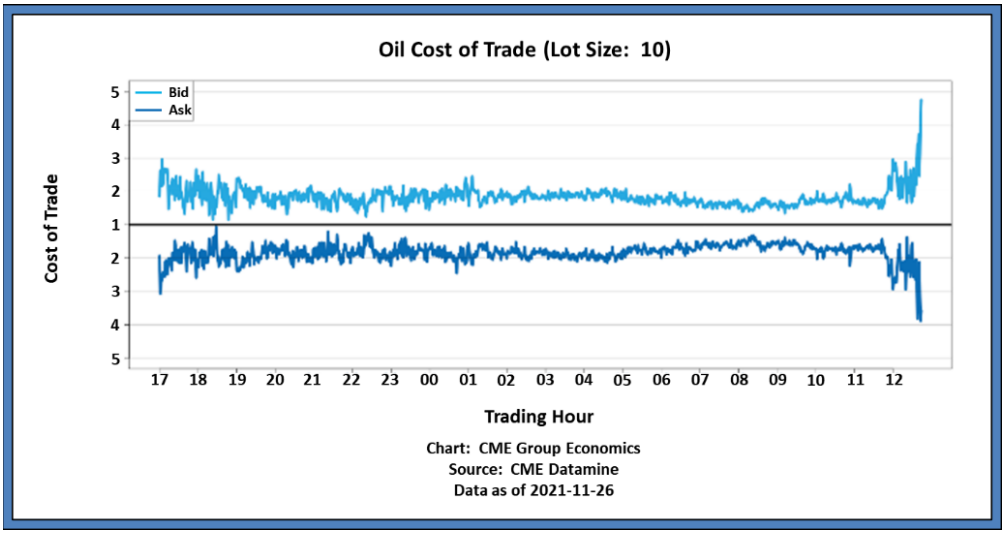


Figure 5
Cost to Trade 10 Lots



Empirical models suggest that the widening of the bid-ask spread in the first part of the trading session was in the range one might expect given the elevated volatility. It is not uncommon for the bid-ask spread to widen during times of heightened volatility. Liquidity in the first part of the trading session responded more or less to the increased risks of the surprise news as it would have on any other day, despite it being a shortened trading day ahead of a holiday weekend.

What happened in the second half of the trading session was even more interesting. The bid-ask spread narrowed to what might be seen on any given trading day, even without a surprise event. We have observed this behavior before in our analysis of event risk,[4] where the event date is known but the

outcome is not and where market prices are expected to go abruptly in one direction or the other depending on the outcome. One can think of elections as examples of this type of event risk. In our studies of the 2016 U.S. Presidential election and the 2016 U.K. Brexit referendum, among others, we observe a clear outcome "discovery" period with wider bid-ask spreads followed quite quickly in the same trading session by a "rebalancing" period with narrower bid-ask spreads after the outcome has become widely known and initial reactions have been digested by the market.

Follow-up: What Happened in the Next 60 Days

We would be remiss if we did not provide some analysis of how markets reacted to the Omicron news in the days, weeks, and months following the surprise. Equity markets, as represented by the S&P500 recovered their losses relative to the pre-shock price in just 15 trading days, by December 15, 2021. It took the crude oil market 29 trading days, to January 6, 2022, to get back to the pre-shock price.

Economists are fond of assuming *ceteris paribus*, that is everything else equal, in their academic models. In the real world of oil trading, many other factors entered into the analysis of the oil market in the two months following the Omicron shock, from soaring natural gas prices in Europe to geopolitical tensions between Russia and the Ukraine, to a realization that the Omicron virus was more contagious yet potentially resulting in less severe health outcomes than the previous Delta variant. The combination of these factors and more helped oil make a full recovery and then some, in the 60 days after the Omicron news shock. By January 25, 2022 WTI crude oil was trading around $85/barrel, compared to the $78/barrel on the day before the Omicron shock, and the local low point of just below $66/barrel on December 1, 2021.

Bottom Line

Our preliminary conclusions, subject to further research, are that the Omicron news shock followed a pattern seen on other event risk days. While Omicron news came on what was expected to be a light-volume, holiday-shortened trading session, liquidity quickly was provided to the market, at first with somewhat higher bid-ask spreads as the news was being digested, and later with narrow spreads as the initial market reaction was better understood. As would have been expected, options traders were especially energized on the put side of the market, due to the downward nature of the price gap that occurred.

Endnotes

Dr. Putnam is a regular contributor to the *GCARD*'s Economist's Edge section. In addition, for further coverage of the crude oil markets, one can also read past *GCARD* articles on this topic.

All examples in this report are hypothetical interpretations of situations and are used for explanation purposes only. The views in this report reflect solely those of the author and not necessarily those of CME Group or its affiliated institutions. This report and the information herein should not be considered investment advice or the results of actual market experience.

1 See Black and Scholes (1973) and Merton (1973).

2 Price gaps are not always surprises, at least to some traders. See Putnam (2020) on the CME Group's market sentiment research regarding event risk.

3 See CME Group (2022).

4 See Putnam *et al*. (2018).

References

Black, F. and M. Scholes, 1973, "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy*, Vol. 81, No. 3, pp. 637–654.

CME Group, 2022, "CME Liquidity Tool." Accessed via website: https://www.cmegroup.com/tools-information/cme-liquidity-tool.html on February 24, 2022.

Merton, R. C., 1973, "Theory of Rational Option Pricing," *The Bell Journal of Economics and Management Science*, Vol. 4, No. 1, pp. 141–183.

Putnam, B., McDannel, G., Ayidara, M. and L.S. Peyyalamitta, 2018, "Describing the Dynamic Nature of Transactions Costs During Political Event Risk Episodes," *High Frequency*, Spring, pp. 1-15.

Putnam, B., 2020, "An Introduction to the Market Sentiment Meter: Reimagining Probability Distributions to Calibrate Event Risk," CME Group website, May 1. Accessed via website: https://www.cmegroup.com/education/articles-and-reports/an-introduction-to-the-market-sentiment-meter.html on February 24, 2022.

Author Biography

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Dr. Bluford Putnam is Managing Director and Chief Economist of CME Group. As Chief Economist, Dr. Putnam is responsible for leading the economic analysis on global financial markets by identifying emerging trends, evaluating economic factors and forecasting their impact on CME Group and the company's business strategy. He also serves as CME Group's spokesperson on global economic conditions and manages external research initiatives.

Prior to joining CME Group, Dr. Putnam gained experience in the financial services industry with concentrations in central banking, investment research and portfolio management. He also has served as President of CDC Investment Management Corporation and was Managing Director and Chief Investment Officer for Equities and Asset Allocation at the Bankers Trust Company in New York. His background also includes economist positions with Kleinwort Benson, Ltd., Morgan Stanley & Company, Chase Manhattan Bank and the Federal Reserve Bank of New York. Dr. Putnam holds a Bachelor's degree from Florida Presbyterian College (later renamed Eckerd College) and a Ph.D. in Economics from Tulane University.

Dr. Putnam has authored five books on international finance, as well as many articles that have been published in academic journals, including the *American Economic Review*, *Journal of Finance*, and *Review of Financial Economics* among others. His newest book, Economics Gone Astray, is now available from World Scientific (WS) Professional.

Dr. Putnam is also a member of the J.P. Morgan Center for Commodities' Research Council.

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Arthur Yu is a manager of Data Science in the Economics Department of the CME Group. He has a Master's in Analytics from the University of Chicago and is currently enrolled in the Master's in Computer and Information Technology program at the University of Pennsylvania.

He is also the president of the board of directors of Nankai University's American Alumni Association of Finance, a group of over 200 financial professionals and executives in the U.S. that provides collaborative opportunities in academics and business to students and faculties at the university. In his role as president, Mr. Yu is heavily involved in providing essential career guidance and informational services on important events to alumni to help establish themselves in the U.S.

He is the champion of China's most famous Trivia Show, "Who is Still Standing?" in 2018 representing the University of Chicago.

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