

# Oil Price News and COVID-19—Is There Any Connection?

Paresh Kumar Narayan

<https://doi.org/10.46557/001c.13176>

| DEPTH                | EXPERTISE | VOICE | GENERATED     |
|----------------------|-----------|-------|---------------|
| Overview (10-15 min) | Balanced  | Alloy | July 07, 2026 |

In early 2020, two dramatic stories were unfolding simultaneously. COVID-19 infections were exploding across the globe, and oil markets were in freefall. Paresh Kumar Narayan looked at those two events and asked a pointed question: which one was actually driving oil prices — the pandemic itself, measured in daily new infections, or the wave of oil-price news that flooded headlines as markets collapsed? The answer turns out to depend on where you are in the crisis, and it has a precise number attached to it.

To test this, Narayan needed data on three different things at once. The price series is West Texas Intermediate crude oil, known as WTI, with daily returns calculated as log price changes and multiplied by 100. The full price sample runs from January 1995 to May 5, 2020, giving six thousand five hundred and ninety daily observations. The COVID-19 series includes daily global new case counts from Our World in Data, covering December 31, 2019, through May 5, 2020 — just ninety-one observations, a tight window but the one that matters. Then there's the most unusual ingredient: a hand-collected daily series of oil-price news, counting positive-worded and negative-worded headlines separately. Narayan extended a manually curated dataset originally built through 2013 all the way through May 2020. That's a painstaking process, and it produces something rare — a daily time series of news sentiment specific to oil markets.

Before running any regressions, Narayan checked whether the three main series — WTI returns, positive news counts, and negative news counts — were stationary, meaning they fluctuate around a stable mean rather than wandering indefinitely. He applied the Narayan and Popp unit-root test, which allows for two structural breaks in both intercept and trend. For WTI returns, the estimated break dates landed in October and December of 2014 — the period of the Saudi-driven price collapse. For the news series, both breaks fell in late 2008 and early 2009, during

the global financial crisis. The null hypothesis of a unit root was rejected at the one percent level for all three series, using a critical value of negative 5.29. That clears the path for the regression analysis.

The descriptive statistics alone tell a story. Before the first global COVID-19 case was reported, mean daily WTI returns were zero point zero three six percent — healthy, steady, equivalent to about thirteen percent per year. After December 31, 2019, that mean collapsed to negative five point one four percent per day. Daily return volatility, measured as the standard deviation, went from two point four percent pre-COVID to thirty-nine point five percent during the pandemic window. That's more than sixteen times larger. Negative oil-price news also rose, from a pre-COVID mean of about eighty-six point five words per day to ninety-five point six during the crisis. The numbers paint a market under extreme stress.

Now to the core of the analysis. Narayan used a threshold regression framework — a model that allows the relationship between a predictor and an outcome to switch between two different regimes once a threshold variable crosses an estimated cut-off. Crucially, the cut-off isn't imposed by the researcher; the model estimates it from the data. In the first specification, that threshold variable is daily global new COVID-19 cases, and the outcome is WTI oil returns.

The headline finding is a threshold of eighty-four thousand four hundred and seventy-nine new daily infections. Below that level, COVID-19 cases do predict oil prices, but modestly — the slope coefficient is zero point zero zero zero eight, with a t-statistic of two point seventeen. Above eighty-four thousand four hundred and seventy-nine cases per day, the effect more than quadruples: the slope rises to zero point zero zero zero four, with a t-statistic of three point zero six. Both effects are statistically significant, but the upper regime is meaningfully stronger. This is a tipping point in the data. The pandemic's grip on oil markets tightened at a measurable moment.

What about oil-price news in this same model? Here's where the story takes a turn. When Narayan conditions on COVID-19 case counts — that is, holds the pandemic signal in the model — oil-price news has limited effects on prices. Negative news does show a weak signal when cases exceed a threshold of seventy-seven thousand four hundred and thirty-four, but the t-statistic there is only one point seventy-five, which doesn't clear conventional significance bars. Once the model knows how many people got infected that day, knowing whether headlines were negative doesn't add much. The pandemic signal dominates. The intuition that bad oil-market headlines drive prices turns out to be weaker than the raw count of new infections.

But Narayan runs a second specification, and it reframes that conclusion. This time, the threshold variable isn't COVID-19 cases — it's oil-price return volatility, proxied by squared daily returns. This shifts the question: instead of asking when infections matter, you're asking when market stress unlocks the predictive power of different signals.

The results are striking. When volatility is below the estimated threshold of four hundred ninety-nine point ninety-five, COVID-19 cases have essentially no effect on oil returns — the slope is zero point zero zero zero one, with a t-statistic of zero point twenty-three, not remotely significant. Above that volatility threshold, the slope jumps to zero point zero zero zero five with a t-statistic of three point five zero. For negative oil-price news, a different threshold applies: once volatility exceeds nine point ninety-two, negative news becomes a significant predictor, with a slope of zero point zero zero three six and a t-statistic of two point ninety-three. Below that volatility level, the same news has no meaningful effect. Positive news shows no comparable role in either regime.

Think about what this means together. The case-count threshold told us that COVID-19 dominates oil prices once infections are high enough. The volatility threshold tells us that under extreme market stress, both the pandemic signal and negative news exert significant influence. The earlier finding — that news doesn't matter when you condition on cases — is really a calm-market result. When markets are already in turmoil, the two forces stop competing and start reinforcing each other. Negative headlines and rising infection counts push oil returns down together.

These two thresholds aren't contradictions. They're two different lenses on the same crisis. The case-count lens asks: at what scale of pandemic does the virus become the dominant market mover? The answer is eighty-four thousand four hundred and seventy-nine daily infections. The volatility lens asks: under what market conditions do signals matter at all? The answer is that extreme volatility is what switches them on — COVID-19 cases at very high volatility, negative news at a lower volatility threshold that was crossed frequently during the pandemic.

The practical implication is direct. A single average estimate of how COVID-19 or news affects oil prices would miss these regime shifts entirely. Models that assume a constant relationship between infections and returns, or between headlines and returns, would systematically understate the effects during precisely the periods when accurate forecasting matters most. Narayan's threshold regression captures that nonlinearity, and the estimated cut-offs give forecasters something concrete to watch.

There's also a data contribution here worth noting. The daily oil-price news series — positive and negative word counts, hand-collected and extended through May 2020 — is offered on request. That kind of manually assembled, conceptually specific dataset is rare in financial economics, and it opens the door for researchers to test other hypotheses about how sentiment moves energy markets.

The pandemic was a stress test for every economic model. What Narayan shows is that it was also a stress test for how we think about information in commodity markets. The rules for what moves oil prices changed during COVID-19. They changed at a measurable threshold, and at that threshold, the scale of human illness outweighed the noise of market news. That's a finding worth sitting with.

This lecture was created by ennepō.

Go to <https://ennepo.ai> to Discover, Create and Follow the latest research in your field.

Read when you can. Listen when you want to.

---

## CREDITS

AI-generated lecture by ennepō.ai, adapted from:

- "Oil Price News and COVID-19—Is There Any Connection?", Paresh Kumar Narayan (Energy RESEARCH LETTERS, 2020). doi:10.46557/001c.13176. CC-BY-SA (<https://creativecommons.org/share-your-work/cclicenses/>)

Restructured, summarized and explained. Not endorsed by the authors.

This lecture (script and audio) is licensed under CC BY-SA 4.0 (<https://creativecommons.org/licenses/by-sa/4.0/>).

<https://ennepo.ai/lecture/29bdec3c-4e46-40bc-8400-f1c99f00bcf7>