

# The Negative Pricing of the May 2020 WTI Contract

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On April 20, 2020, the day before it was due to mature, the price of the NYMEX WTI crude oil futures contract (known as the May 2020 delivery contract or CLK20) tumbled to -\$37.63. This was the first time that a WTI futures contract had experienced a negative price since NYMEX WTI trading began almost 40 years previously. The purpose of this article is to investigate the plausible reasons behind this unprecedented event.

In early 2020, the WTI futures market steered into a super contango due to demand shattered by COVID-19 lockdowns and supply exacerbated by geopolitical tensions. The super contango in turn incentivized cash and carry (C&C) traders to open long positions on CLK20 and short positions in more distant contracts, while simultaneously booking storage at a facility in Cushing (Oklahoma), the delivery hub of NYMEX WTI futures contracts. In this research, two pieces of evidence corroborate the idea of increased participation among C&C arbitrageurs in March and April 2020. First, we note that the futures-spot spread at that time exceeded the cost of financing and carrying the spot asset, and thus C&C arbitrage was profitable. Second, we demonstrate that increases in crude oil inventories at Cushing, in response to the widening of futures-spot spread, were 4.3 times higher in March and April 2020 than had been historically. Both pieces of evidence shed light on the lack of storage capacity at Cushing that prevailed before the negative pricing.

On April 20, 2020, or one day before the maturity of CLK20, the large number of open positions combined with the lack of storage at Cushing contributed to create an unprecedented problem of illiquidity. Long CLK20 traders who had not secured storage at Cushing had to either pay an exorbitant cost for storage, if any free capacity was still available, or close their positions at any price. In the end, they chose to close their positions at negative prices. Among the aggravating factors were i) the staggering margin calls that long traders inexorably had to pay as the price of CLK20 fell and ii) the likely price distortion and market abuse that occurred as a consequence of the trade-at-settlement (TAS) mechanism.

Even within one day after the negative price event, some energy market commentators had blamed index traders for distorting the price of CLK20. The line of reasoning that these market pundits advocated was simply that by rolling their long CLK20 positions to more distant contracts, index traders had triggered the negative pricing of CLK20. We demonstrate the lack of veracity of these claims in reference to the United States Oil fund, the largest WTI crude oil exchange-traded fund, by showing that its flows did not influence either the return or the change in volatility of CLK20. We also show that the rolling of large, long index trader positions on prespecified dates ahead of maturity did not impact the futures-spot spreads in March and April 2020, and thus did not trigger further C&C trades or contribute to the observed negative pricing.

Among the practical implications of this research are lessons to traders with long front-end positions right before maturity, calling them to exert caution in super-contangoed futures markets, since at maturity the long position can suddenly become unfeasible if the asset cannot be physically stored. Our findings thus call for regulators to monitor the long positions of traders close to delivery so that they do not dislocate the natural convergence of the futures and spot prices at maturity. To

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ensure the integrity of the TAS pricing mechanism, it might be of interest for regulators to limit the netting of speculative TAS positions with speculative outright positions during the contract delivery month.