

## Crypto Market Surveillance Has Arrived

By Sharon Brown-Hruska, Jordan Milev and Trevor Wagener (May 25, 2018, 12:42 PM EDT)

The U.S. Department of Justice and the U.S. Commodity Futures Trading Commission have launched a criminal investigation into potential cryptocurrency market manipulation, according to May 24, 2018, news reports. Reports indicate the investigations are looking into possible spoofing — the submission of orders that aren't intended to execute to affect other participants' orders — and wash trading — trading between two accounts controlled by the same person or entity to affect market perceptions of demand or liquidity — in cryptocurrency spot markets.[1] These reports come a few months after the DOJ and CFTC announced a series of coordinated criminal and civil enforcement actions targeting "commodities fraud and spoofing schemes"[2] that the DOJ called "the largest futures market criminal enforcement action" ever.[3] The DOJ announcement highlighted market surveillance, emphasizing that the DOJ and CFTC "have developed the ability to identify spoofing patterns through sophisticated analysis of market-level data" and the DOJ and CFTC "expect to use data analysis to an even greater degree in order to identify fraudulent and manipulative conduct in our financial markets." [4]



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This spoofing and manipulation enforcement wave was announced just one month after bitcoin futures markets launched on the Cboe Global Markets[5] and the Chicago Mercantile Exchange.[6] Shortly after Cboe and CME certified their contracts were in compliance with CFTC requirements, the CFTC published documents outlining its approach to bitcoin futures, noting in a backgrounder on virtual currencies that "in 2014, the CFTC declared virtual currencies [like bitcoin] to be a 'commodity' subject to oversight under its authority under the Commodity Exchange Act." [7] The document further asserted that "the CFTC not only has clear legal authority, but now also will have the means to police certain underlying spot markets for fraud and manipulation" through "heightened review" in collaboration with exchanges, including exchanges "providing the CFTC surveillance team with trade settlement data upon request," entering "information-sharing agreements with spot market platforms to allow access to trade and trader data," and monitoring the spot markets data for "anomalies and disproportionate moves" relative to the futures markets.[8] In another announcement, the CFTC reiterated its expectation that "the futures exchanges, through information sharing agreements, will be monitoring the trading activity on the relevant cash platforms for potential impacts on the futures contracts' price discovery process, including potential market manipulation and market dislocations." [9]



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Gemini, the digital currency exchange whose bitcoin auction is used to determine the settlement price of the bitcoin XBT futures contracts that trade on Cboe's CFE Exchange, announced on April 25, 2018, that it would use Nasdaq's SMARTS Market Surveillance system to "monitor [its] marketplace" and "become a market leader in custom surveillance rule creation and alerting for the crypto-asset market" in order to build "a rules-based marketplace." [10] According to Nasdaq's parallel announcement, "Nasdaq's SMARTS surveillance technology automates the detection, investigation and analysis of potentially abusive or disorderly trading" and will be used to "surveil activity across the Gemini auction process." [11]

Market surveillance is generally the way regulators identify potential spoofing and/or market manipulation. Use of such tools can also serve to discourage market manipulation. Thus, the emergence of institutionalized market surveillance on both futures and spot markets in crypto products can be seen as a strong sign for the long-term future of crypto markets. In the short run, however, media coverage of the tools may create negative sentiment among market participants to the extent it is believed that market surveillance can lead to a flurry of future enforcement actions and civil litigation that can hamper the resources of crypto exchanges.

### Researchers Analyzing 2013 Exchange Transaction Data Conclude Manipulation Drove a Previous Bitcoin Price Spike

According to researchers, evidence has emerged that such trading practices likely occurred on a large scale nearly five years ago in crypto markets.

Cryptocurrency manipulation theories have notoriously abounded online, including more than 186,000 Google search results for "bitcoin manipulation" and 1.41 million results for "bitcoin spoofing." However, concrete evidence to support such allegations has generally been lacking. That may have changed in January 2018 with the publication of an article titled "Price Manipulation in the Bitcoin Ecosystem" in the Journal of Monetary Economics. [12]

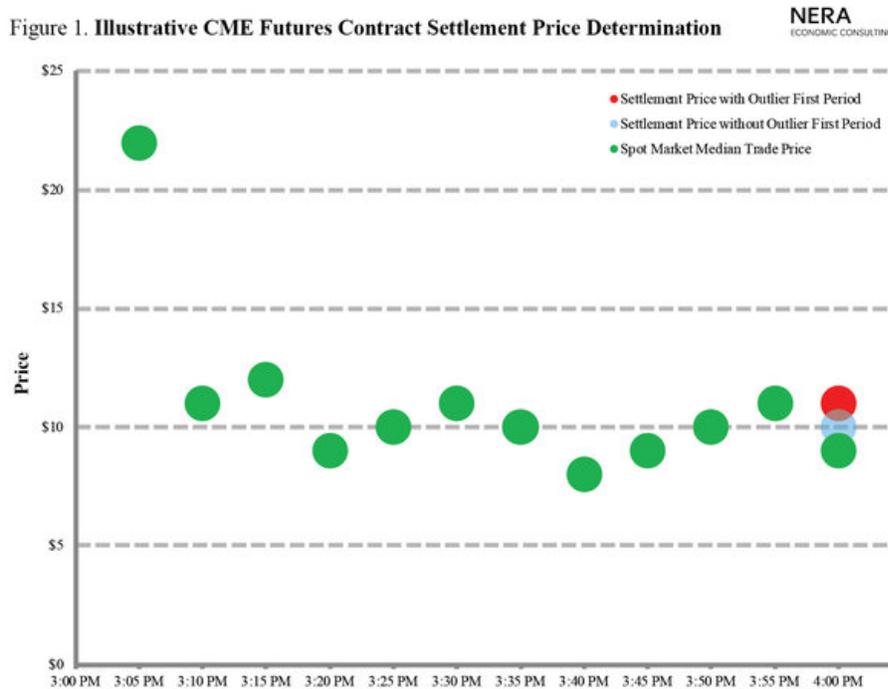
The JME article described allegedly suspicious trading activity on the Mt. Gox Bitcoin exchange in late 2013 that its authors say coincided with both the theft of \$188 million in bitcoins and a spike in the U.S. dollar value of bitcoin from \$150 to more than \$1,000. The JME article authors state that they used leaked Mt. Gox transaction history data and publicly available daily aggregate values to conduct their analysis, using regression analysis to control for events other than allegedly suspicious trades that might have affected bitcoin prices. The JME article concludes "that the suspicious trading activity on the Mt. Gox exchange was highly correlated with the rise in the price of Bitcoin during the period studied" and that "manipulations can have important real effects" on bitcoin prices. [13]

**Takeaway:** While the conclusions of the JME article apply narrowly to market conditions nearly five years ago, the findings leave open the possibility that manipulation on a substantial scale may be plausible in the present. In order to determine whether manipulative trading is occurring today, crypto spot and futures market trade and futures contract settlement data would need to be analyzed in detail — the sort of market surveillance the CFTC suggested it is working on with exchanges, or, alternatively, the sort of economic analysis that litigants would use to analyze the plausibility of causation claims in a manipulation case. Notably, such techniques are not new in principle, although the particular application to crypto markets does necessitate a judicious approach to how they are applied.

### Economic Analysis Will Depend on Contract Specifications and Market Microstructures

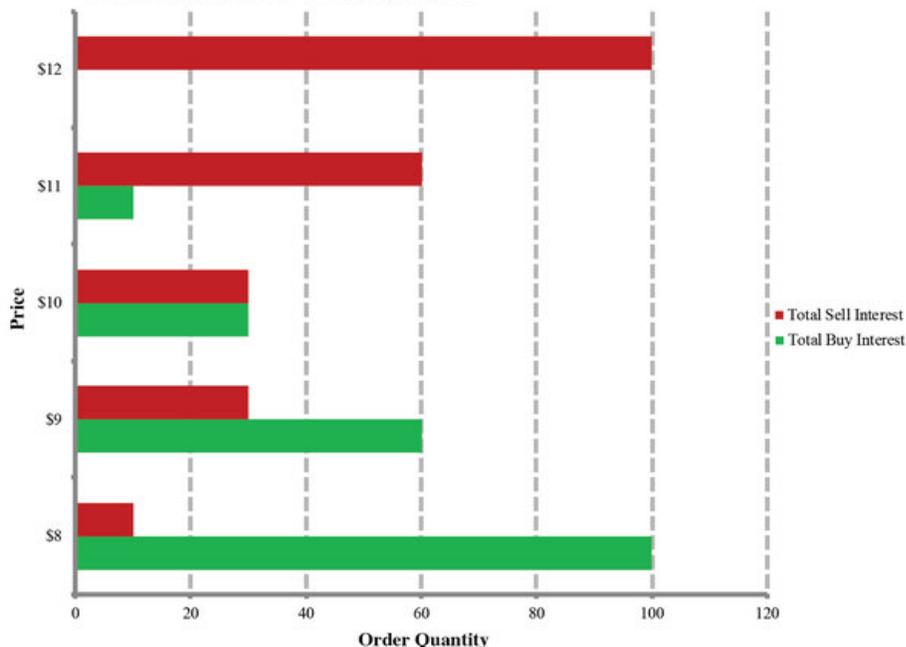
In considering possible market manipulation allegations that could arise in either enforcement actions or civil litigation, one factor to keep in mind is that different futures markets settle using different methodologies and reference prices. For example, the CME bitcoin futures settle against the CME CF Bitcoin Reference Rate, or BRR, at 4 p.m. London time on the expiration date,[14] where the BRR is the mean of 12 median trade prices[15] from 12 consecutive five-minute windows across multiple cryptocurrency spot markets.[16] Cboe bitcoin futures, on the other hand, settle against the Gemini Exchange Auction, which settles using a methodology that prioritizes large orders that minimize the absolute value of the imbalance between total buy and sell orders at a given price.[17] Theoretically, the BRR could potentially be manipulated to the extent enough spot market transactions occur in a five-minute window with low activity to affect that period's median trade price, pushing the mean of the 12 periods' median trade prices upward or downward on a CME bitcoin futures settlement date. By contrast, the Gemini Exchange Auction potentially could be manipulated by "banging the close" actions in response to indicative prices published immediately prior to the auction on a Cboe bitcoin futures settlement date.

Illustrative potential manipulation approaches are demonstrated below in figures 1, 2, and 3. In figure 1, a hypothetical CME futures contract settlement is affected by outlier trade prices in the first period of the BRR settlement window that push the settlement price up from \$10 to \$11.



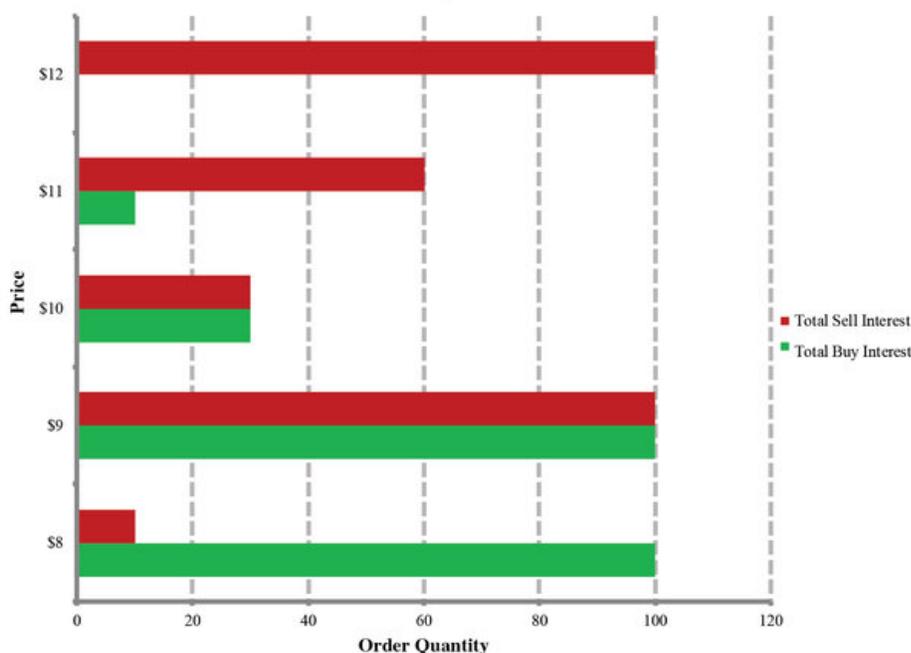
In figure 2, a hypothetical Cboe futures contract settlement is shown without any manipulation. The simplified Gemini order book is shown at the time of the auction, and both the \$9 and \$10 prices will execute a quantity of 30, but the \$9 price will leave a larger imbalance between buy and sell trade prices. Consequently, the Cboe settlement price will be \$10.

Figure 2. Illustrative Cboe Futures Contract Settlement Price Determination—No Manipulation



In figure 3 below, a hypothetical Cboe futures contract settlement is shown with potential manipulation. The simplified Gemini order book is shown at the time of the auction, and the \$9 price shows by far the largest execution quantity, interrupting the order distributions observed in the hypothetical “no manipulation” order book shown in figure 2 above. The figure 3 example could be consistent with cross-market manipulation if the trader(s) placing the large orders at the \$9 price have a larger derivatives interest that would benefit from a lower settlement price.

Figure 3. Illustrative Cboe Futures Contract Settlement Price Determination—Potential Manipulation



The differences in market design and market microstructures between crypto spot market platforms and established CFTC- and U.S. Securities and Exchange Commission-regulated exchanges may also affect the type of economic analysis that is needed to investigate issues of alleged manipulation. For example, spoofing allegations have often involved the asymmetric use of hidden orders on the side of the market intended to execute versus large visible orders on the side of the market not intended to execute. However, hidden orders are not offered by many crypto spot market platforms, and when offered, some are subject to special execution conditions. Economic analysis of trade data will have to take these subtle market differences from prior spoofing matters into account.

**Takeaway:** Economic analysis of trade data is likely to feature front and center in either enforcement actions or civil litigation

regarding alleged market manipulation. What economists would look for in the data as potential evidence of causation or the lack thereof will depend on contract specifications, particularly the futures contract settlement methodology. The specifics of the contract settlement methodology would need to be properly analyzed in each case to infer whether the evidence points to manipulation and to rule out alternative explanations. The crypto futures contract settlement methodologies make any flagged instances of possible market manipulation in trade and settlement data well-suited to economic analysis approaches previously applied in alleged benchmark manipulation matters or “bang the close” matters.

### **Crypto Futures Beyond Bitcoin**

Crypto futures may expand substantially beyond Bitcoin futures. A U.K. crypto trading platform that already offered futures in bitcoin and ripple announced on May 11, 2018, that it would launch ether futures,[18] and there are signs that additional crypto futures may be arriving across the pond as well. The launch of bitcoin futures on U.S. exchanges in December 2017 was preceded by the creation of the Gemini Exchange Auction in bitcoin in September 2016 and the CME’s creation of the BRR in the fourth quarter of 2016. Gemini announced the creation of an ether auction starting July 28, 2017,[19] and CME Group announced on May 14, 2018, that it was planning to create ether reference rates.[20] While neither CME nor Cboe has announced their intent to launch ether futures, the prerequisites for such futures products are appearing.

### **Conclusion**

As market surveillance arrives on the scene for bitcoin futures and spot markets, the prospect of the recent wave of spoofing and manipulation enforcement actions washing over crypto markets, aided by increasing market surveillance, may cause concern in some quarters. However, precedents in established futures and spot markets suggest that sunlight is the best disinfectant and that, in the long run, crypto markets and their participants will likely see benefits from increased market surveillance. In the meantime, analyses of trade data by market surveillance teams working for the CFTC, futures exchanges, and spot market operators are likely to reveal whether potentially manipulative trading practices are being employed in major crypto markets. If any enforcement actions follow, private litigants may follow suit, and the application of financial economic tools to the analysis of trade data for evidence of artificiality will be paramount, as is already the case with other markets.

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[4] Ibid.

[5] Cboe Global Markets Inc., “Cboe Bitcoin Futures (XBT) Close First Day of Trading; Post Volume of More Than 4,000 Contracts,” Dec. 11, 2017, available at [CBOE-IR-V2/press-release/2017/cboe-bitcoin-futures-end-first-day-with-volume-of-more-than-4000.pdf](http://ir.cboe.com/~media/Files/C/CBOE-IR-V2/press-release/2017/cboe-bitcoin-futures-end-first-day-with-volume-of-more-than-4000.pdf) target="\_blank"><http://ir.cboe.com/~media/Files/C/CBOE-IR-V2/press-release/2017/cboe-bitcoin-futures-end-first-day-with-volume-of-more-than-4000.pdf>.

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[7] Commodity Futures Trading Commission, “CFTC Backgrounder on Oversight of and Approach to Virtual Currency Futures Markets,” Jan. 4, 2018, p. 1, available at [https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/backgrounder\\_virtualcurrency01.pdf](https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/backgrounder_virtualcurrency01.pdf).

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[9] Commodity Futures Trading Commission, “CFTC Statement on Self-Certification of Bitcoin Products by CME, CFE and Cantor Exchange,” Dec. 1, 2017, available at <https://www.cftc.gov/PressRoom/PressReleases/pr7654-17>.

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[11] Nasdaq, “Gemini to Launch Market Surveillance Technology in Collaboration with Nasdaq,” April 25, 2018, available at <https://www.nasdaq.com/press-release/gemini-to-launch-market-surveillance-technology-in-collaboration-with-nasdaq-20180425-00327>.

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[15] Volume-weighted median trade prices from each of the 12 five-minute windows.

[16] CME Group, "CME CF Cryptocurrency Reference Rates," May 3, 2018, available at <http://www.cmegroup.com/education/bitcoin/bitcoin-reference-rate-methodology.html>.

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