FREQUENTLY ASKED QUESTIONS

CME Cattle Market Volatility

CME Group values its relationship with the cattle community and is committed to helping producers and commercial firms manage their risk. Below are recent updates and frequently-asked questions related to CME Group's work with the industry to address concerns about volatility in cattle markets.

At NCBA's conference in January 2016, CME Group Executive Chairman and President Terry Duffy and other senior executives addressed the issue of cattle market volatility with the Cattle Marketing and International Trade Committee.

- CME Group emphasized that nothing is more important than the integrity of its markets. The exchange also stressed its focus on Market Regulation, enforcing CME Group rules and prosecuting violations at any speed.
- Representatives of CME Group met with state cattle associations, commercial customers and individual market participants to discuss concerns around volatility in the cattle market.
- Based on these meetings and feedback from customers, CME Group and NCBA established a working group to discuss cattle market performance.

On February 1, less than a week after NCBA's conference, CME Group added livestock products to its messaging efficiency program (MEP).

- Between January and April, the ratio of messages to orders filled in the Live Cattle futures market decreased by 15 percent, while overall volume was relatively unchanged.

On February 29, CME livestock futures and options trading hours were reduced to align with the period of greatest liquidity in these markets – roughly 87 percent of trades occurred between the 8:30 a.m. and 1:05 p.m. CT timeframe during 2015.

In March, the joint NCBA-CME working group met for the first time as part of a long-term commitment to the industry. This group continues to work on a number of initiatives to address concerns about cattle market volatility, including, but not limited to messaging efficiency and circuit breakers.

- The working group is reflective of CME Group's long history of working with commercial hedgers, adapting to ag industry changes, and—when necessary—modifying contract specifications.
- CME Group is working directly with NCBA to ensure this working group continues to represent a broad cross-section of the cattle industry to better understand the industry's concerns and further enhance CME livestock markets for those who use them for hedging and price discovery.
- The working group is jointly exploring additional changes to the market to enhance the effectiveness of CME livestock futures and options as risk management tools for cattlemen, including the implementation of circuit breakers to complement the existing hard price limits.

On May 20, CME Group participated in a panel discussion and Q&A session with cattlemen in Dickinson, North Dakota on cattle market volatility.

- The panel was led by North Dakota Senator Heidi Heitkamp and included representatives of USDA, North Dakota Stockmen's Association, Independent Beef Association of North Dakota and other cattle industry experts.
- CME Group highlighted recent discussions with the NCBA working group about the potential to implement circuit breakers to limit the impact of volatile price moves in cattle markets.

On June 6, CME Group began offering an additional pre-open period for customers to enter, cancel and modify livestock futures and options orders on CME Globex from 2:30 – 4:00 p.m. CT Monday to Friday.

Market Volatility

1. **Increased volatility has made hedging more challenging. Why should I continue to hedge?**
   As volatility increases, there is an even greater need and incentive to limit market and price risk through hedging. The Live Cattle market is no different. The key is having a hedging instrument that is sufficiently liquid for both longs and shorts to manage their risk when they need to. CME Group continues to work with the industry to build and improve the effectiveness of its livestock markets.

2. **How do you know HFT is not the primary cause of volatility? How can you be sure?**
   We believe that there are a number of factors that have contributed to recent market volatility, including, but not limited to, increasingly opaque cash markets, low exports, high inventories in cold storage and a backlog of cattle in feedlots, as evidenced by USDA's recent report showing replacements 9 percent higher than expected.

   CME Group has done extensive analysis of the Live Cattle futures market over the past several months, primarily focusing on the limit up/down days. On these days, our observation is that manual point-and-click traders, not algorithmic, and not HFT traders, led the market moves. On average, in 2015, HFT firms accounted for just 10 percent of the total Live Cattle futures volume.

   During some of the significant market moves, manual traders represented more than 80 percent of all aggressive trades. We further observed that as a market trended toward the limit, manual traders more aggressively traded the market, further contributing to the price volatility. Feedback from participants has confirmed this observation. Nevertheless, CME Group will continue to analyze and monitor trading activity in these contracts. To the extent we identify any participant, whether manual point-and-click or HFT, engaging in conduct that may violate our rules or jeopardize the integrity of a contract, we will investigate and prosecute the violator.

3. **If not HFT, then what do you say is causing these volatile price moves?**
   We believe there are a number of fundamental factors that have contributed to recent market volatility:

   - Increasingly opaque cash markets hinder price discovery – only 20 percent of cattle sales are negotiated in cash markets across the U.S. today, with less than 5 percent negotiated in major producing states, such as Texas and Oklahoma.
   - Low exports – U.S. beef exports declined by 12 percent in 2015, the largest non-BSE related decline in beef exports since at least the late 1980s.
   - Increased supply – beef in cold storage increased 26 percent year-on-year, and cattle were held on feedlots longer, resulting in the largest year-on-year increase in average carcass weights since 2002.

   Industry experts, such as CattleFax CEO Randy Blach, have highlighted the role of fundamentals in recent cattle market volatility. Dr. Koontz of Colorado State University notes fewer cattle are being used for price formation in cash markets in his ongoing Price Discovery Project research.

4. **How did you determine that 10 percent of the cattle market is HFT?**
   It is first important to recognize there is no commonly accepted definition of what constitutes a high frequency trading strategy. One proposed definition would identify proprietary firms that submit more than two automated order messages per second per instrument measured over the course of a given time period. Liberally construing this proposed definition, we sought to identify firms trading for proprietary accounts that had more than two automated order messages per second per Live Cattle futures instrument over the course of any hour of trading in 2015. From this, we identified a small group of firms that exceeded the two messages per second. Those firms represented approximately 10 percent of the total Live Cattle futures volume on average in 2015.

5. **Others have suggested much higher numbers and have challenged this number. How do you address this?**
   Particularly on social media, many have incorrectly suggested HFTs make up as much as 70 percent of livestock markets. Those figures are inaccurate. In fact, a paper1 written in March of 2015 by two economists identified that roughly a third of agricultural livestock market volume was done by automated traders. Our ongoing analysis of CME livestock markets shows that less than 50 percent of volume is attributable to automated trading, which includes basic automated functionality such as auto-spreaders used by hedgers and risk managers.

   As HFT is a subset of automated trading, the percentage of market volume attributable to HFT must therefore be smaller.

   Only CME Group Market Regulation and the CFTC are able to view customer-level transaction data to accurately identify the true size of HFT. Our extensive analysis shows that on average, in 2015, HFT firms accounted for just 10 percent of the total Live Cattle futures volume.

6. **Does CME Group give HFTs an advantage?**
   No. Within CME Group's infrastructure, all market participants are on equal footing, including HFTs. Outside of CME Group's infrastructure, each participant chooses how he or she interacts with the markets – among many other choices, they can choose how to connect to the exchange, whether by dial-up or fiber connection; how to route orders, whether routed directly to the CME Globex trading platform or routed through components of their IB or FCM; and how to receive market data.

7. **I read about recent changes in CME Group's systems. Why were these changes made?**
   We continuously enhance our infrastructure to provide the latest and best technology architecture for our clients. Our most recent upgrade is designed to provide a more consistent customer experience for all participants in all markets.

8. **Can some customers obtain additional information about market activity or the identity of other market participants?**
   No. Market data is released to everyone at the same time. There is no information in the market data feed that would allow the identification of other market participants.

9. **Do some customers get special deals on rates or access?**
   There are a number of different rates based on membership status. These can all be found on our web site. Additionally, we have some market maker and incentive programs in many of our products. These are all in the public domain, as they are filed with the CFTC. They can be found both on our and the CFTC web sites. These programs have specific performance and/or participant criteria. However, none of them provide preferred access to any customer – they are all financially based.

Messaging Efficiency

10. **What is a message?**
    A message is something sent by a buyer or seller to enter a new order, modify an existing order or cancel an existing order on the CME Globex electronic trading platform.

    It is important to understand that a high level of messaging by itself does not indicate bad behavior. Many market participants who operate using a market-making business model, particularly in options where each futures tick results in the need to update dozens of bids and offers, have high messaging ratios as a result of their efforts to maintain resting bids and offers that provide liquidity for commercial customers.

11. **How does the messaging efficiency program (MEP) work?**
    CME Group's messaging policies are designed to ensure efficient messaging – that someone doesn't continually enter orders, modifications or cancellations without trading. Each product has a benchmark message-to-fill ratio. In the case of Live Cattle futures, that ratio is 20:1 – meaning 20 messages for each one fill. As a hedger, you put an order in the market and expect it will get filled. You might have to move it or modify it if market conditions change, but not that frequently. On the other hand, market makers who provide liquidity to hedgers may be more regularly changing orders to frame the current market price and to manage the positions they are carrying. That means their message-to-fill ratio might be higher. The MEP allows both participants to message as they need to within the ratio so that market liquidity does not suffer.

12. **Why haven't you had a messaging efficiency program in livestock before?**
    A messaging policy will reduce messaging from all market participants, including those who provide liquidity though market-making strategies. This is one of the reasons CME Group does not put messaging policies in place in smaller volume, less liquid markets. CME Group evaluates markets on a quarterly basis to determine whether they need a new policy or need adjustments to the current policy. For a product to be included, CME Group considers whether the product is mature enough on the screen (as measured by average daily volume and messaging traffic) as well as customer feedback.

    CME Group added livestock products to its messaging efficiency program on Monday, February 1, 2016.

13. **What have been the results of the livestock MEP policy to date?**
    Since the livestock messaging policy has been in place, the ratio of messages to orders filled in the Live Cattle futures market has been reduced by 15 percent, while overall volume was relatively unchanged.

    For January 2016, before the policy went into place, the average message-to-order ratio was 4.64:1. In February 2016, the first month of the policy, the ratio decreased to 4.37:1. As of April, it dropped even further to 3.93:1 – that's a decrease of 15 percent between January and April. We are pleased that, clearly, the messaging policy is having an impact on messaging behavior.

14. **Will the MEP reduce cattle market volatility?**
    While the average message-to-order ratio decreased by 15 percent between January and April, it's important to note that the MEP is not intended to dampen volatility. Volatility in livestock futures markets is driven by a variety of factors including, but not limited to, decreasing transparency in the cash markets for the futures markets to respond to.

Co-Location/Latency

15. **What is Co-location?**
    Co-location allows you to place your server in a CME Group co-lo facility, and is intended to provide customers with low latency connectivity for all products traded on the CME Globex platform.

    Co-location & Data Center Services are available to all CME Group customers. Any CME Group customer can co-locate either directly through CME Group or through a third-party vendor at one or both of our data centers. The cost for co-location is dependent on your technology needs and starts at less than the cost of a quote system.

16. Why do you need co-location?

CME Group can control the way we treat orders within our match engines and the way we give market data to all market participants – in our case, to everyone at once. However, CME Group has never been able to control the speed at which customer orders get to our markets or the speed at which customers get information from our markets. This is driven by factors including distance from the exchange and the type of communication link each customer uses. Even on the fastest communications lines, an order will always take longer to get to CME Group from California than from Iowa – simply due to physics. With its co-location facility, the exchange can provide a broad range of market participants with equal latency connections to the marketplace. Today, third-party providers offer this access at a range of price points, including as low as $1,000/month.

Historically, firms competed to get closer to Globex, often being required to rent or buy real estate, giving an advantage to those who did so. Co-location offers all customers the opportunity for equal access, across all CME Group markets.

17. Why can't you slow the market down so everyone has the same latency?

Slowing the market or requiring orders to remain in the matching engine for a minimum period of time would negatively alter the behavior of liquidity providers or market makers. In order to make two-sided markets, they must continuously adjust orders as the market moves. Requiring a minimum amount of time, such as a second, will cause market makers to make wider markets as they seek to mitigate their risk. Additionally, requiring everyone's order to sit in the book for a minimum amount of time would still allow the fastest systems "to" the exchange to have an advantage.

Customer Order Flow

18. Who controls how my orders go to CME Group?

Customers control the speed at which they access our markets.

19. Can HFTs see my orders and jump ahead in order execution?

No one can see another customer's orders, and orders are executed in the order received. Orders flow sequentially through the match engine with no ability for one order to move ahead of another order. Cancellations are handled the same way as buy or sell orders so a cancellation cannot get in front of a buy or sell that is already in the engine.

20. What prevents an order from getting in front of another order?

In an electronic market, an allocation algorithm is used to allocate fills to market participants. CME livestock markets primarily use FIFO (First In, First Out). The FIFO algorithm uses price and time as the only criteria for filling an order.

In this algorithm, all orders at the same price level are filled according to time priority; the first order at a price level is the first order matched.

21. Why do you show a five-deep book2?

We believe that showing a five-deep book provides traders with additional information to make decisions as to how to place orders. As mentioned above, when an order arrives to be executed, the book locks, allowing the order to sweep the book.

Clearing, Credit and Risk Controls on Trade

22. Can day traders trade as big of a position as they want, as long as they are even by the end of the day?

No. Credit controls and position limits apply to all traders, including intraday, and limit the size of orders they can enter and positions they can take.

CME Group focuses on performance bond and appropriate margin methodology. Both CME Group and our clearing members use risk management tools to protect our markets:

- CME Group margins futures accounts twice daily to ensure financial security.
- An order cannot be entered into the CME Globex system without passing pre-existing credit checks established by the trader's clearing firm.
- Any order entered must have adequate funds allocated to it with an assumption that it would fill per Globex Credit Controls.

Globex Credit Controls are in place and set by clearing firms. The CME Globex Credit Controls (GC2) provides pre-execution risk controls and allows Clearing Firm Risk Administrators to set real-time credit limits.

23. Who monitors CME Group trading activity to insure oversight of fair and efficient markets?

One of the great benefits of electronic markets is the ability to provide a complete audit trail and immediate oversight of trading activity. CME Group's Market Regulation constantly monitors the market for rule violations by all types of traders.

- CME Group's Market Regulation has developed a highly granular and precise audit trail for electronic order, trade and market data information which we further enrich with substantial reference data.
- Market Regulation tracks every order, modification, cancellation, rejection, transaction and book state change on the Globex platform at the millisecond level in its regulatory systems.
- Comprehensive audit trail and reference data provide the information necessary to support effective monitoring and analysis of automated trading activity. Surveillance technology continues to evolve to protect against market abuse.

In summary, CME Group places the utmost importance on market integrity, trade certainty and fair execution for all customers. We continue to adapt our surveillance and enforcement technologies to protect against any market abuse and capture any potential rules violations, regardless of trading speed. We recognize our contracts must "work" for our commercial hedging customers.

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