"Flash Crash Conference: One Year Later"
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Washington, DC – Georgetown University
Rafik B. Hariri Building, Fisher Colloquium
Prepared for Bryan Durkin

Thank you, Reena, for that kind introduction. It is such a pleasure to be here today with you and this room of financial services leaders as we reflect back on the "flash crash" that all of us experienced last year.

In the last few decades, we have seen a variety of market shocks that impacted derivatives markets. I think it is a great credit to our collective industry that – whether those shocks were small or large – we always work to reflect on what we can learn to protect both the market and individual market participants in the future.

As we begin today's program, we all are here to talk about how we can make financial markets even stronger. Clearly there is something that each of us can do in that regard. It is my hope that we will not only use our time together to reflect on how we can learn not only from what went *wrong*, but also from what went *right*.

Even in the context of the market shock on May 6th, CME Group provided important examples of market structures that worked. I hope today to provide you with some insight into what did work well and what we can take forward as we consider the recommendations of regulators and other market participants.

Background

I would like to begin with just a brief overview of where I am coming from.

As many of you know, CME Group is a leading and very diverse derivatives marketplace.

- We are not a stock exchange. We operate highly efficient derivatives markets with deep liquidity and low execution costs.

- Our products are industry benchmarks, the most diverse product line of any exchange – interest rate products such as Eurodollars and U.S. Treasuries, equity index products, foreign exchange, energy and metals products and agricultural commodities.

- We have a transparent and open market structure. And I think it's important to note that we have a very diverse and global customer base, made up primarily of banks, hedge funds, asset managers, corporations, commercial producers, intermediaries and proprietary trading firms.

- More than 80 percent of our business is transacted electronically on a highly scalable electronic trading platform, CME Globex, which operates virtually 24/7 and

is distributed to 150 countries. We also operate two very active trading floors, one in New York and the other in Chicago.

- We have a very strong track record of innovation and customer service, and we are a global partner of choice for exchanges in developing economies who are looking to broaden the distribution of their products and leverage our technology capabilities to help them do that.

- Lastly, we also are unique in that part of the value we provide to our customers is our industry-leading central counterparty clearing services.
    - We have strong track records both in listed and over-the-counter derivatives.
    - And in more than a century of operations, no customer has ever lost money due to a clearing firm default.

We are a leading derivatives marketplace. Because our customers have the ability to transfer their risk in our markets, they can trade more goods. Write more loans. Fly more flights. Businesses grow and economies expand because of the risk management offered at CME Group.

Looking Back at May 6

With that background in mind, let's talk about the analysis we've done since this time last year.

As the Chief Operating Officer of this company, I can tell you – this has been a thorough review.

What we found was that our markets functioned properly.

- We did not find any trading activity that appeared to be erroneous or that *caused* the break in the cash equity markets.

- We did not find any market participant in CME Group markets who reported that trades were executed in error.

- We did not find any reason to cancel or re-price a single trade.

Instead, we found that our markets provided an important price discovery and risk transfer function and served as a moderating influence during this market crisis.

So, if everything functioned properly, what really happened?

Let's take a closer look.

Prior to May 6th, domestic equity markets had been rising steadily with the major indexes rallying during 12 of the previous 14 months. Still, there were some major issues overhanging the market and causing legitimate investor concern and hedging interest.

In reaction to continuing indications of economic recovery, concerns mounted that possible Fed monetary tightening might inhibit the recovery, possibly leading to a “double-dip” economic downturn. Many technical traders had begun to look for a possible equity market correction. This was further exacerbated by heightening tension as a result of the Greek debt crisis that had boiled over in violence on May 5th in the streets of Athens.

These factors had weighed on international equity indexes the evening before. Accordingly, domestic equity markets were generally weak as we entered the trading day on May 6th.

On that day, in our markets, 5.7 million contracts were transacted in our June E-mini S&P futures contract. Twenty eight percent of those were transacted between 1 o’clock and 2 o’clock Central Time – the hour during which the flash crash occurred. Making up that activity were approximately 250 CME Globex execution firms, 8,300 accounts and 9,000 User IDs.

During most of that crucial hour, the bid/ask spread in E-mini futures was a tick, or one quarter of one index point, wide. The market traded in a largely orderly manner despite the significant sell off and subsequent rally. At approximately 1:45, the market declined 12.75 points over a period of approximately 500 milliseconds on sales by multiple market participants. The last 6 points of that move occurred in just 5 milliseconds on the sale of approximately 400 contracts for stop orders. Following those sales, the bid/ask spread widened to 6.5 points, or 26 ticks for a fraction of a millisecond.

Just to give this a little context, it takes between 300 and 400 milliseconds to blink your eyes. So we’re really dissecting the events here at extreme fractions of each second.

At the moment that the bid/ask spread widened, one of CME Group's volatility mitigation tools was triggered. This functionality is called stop logic. Stop logic automatically paused the market for five seconds to allow participants to react to what was taking place and also to allow liquidity to come into the market. The market subsequently reopened three ticks higher, and thereafter rallied more than 40 points in the following three minutes.

The specific E-Mini futures “trade” referenced by the CFTC and SEC as “a possible cause” was actually a series of hundreds of smaller orders executed as part of a bona fide hedging strategy. These orders were entered and executed over a 20-minute period – from before the market drop through the subsequent recovery. In fact, more of this account’s volume was executed as the market rallied rather than during the decline. The orders were submitted using a commonly used volume-participation algorithm designed to mitigate the market impact of large orders while achieving the client’s execution objectives.

Our Market Regulation team reviewed a significant amount of activity during this critical one-hour period – a snapshot in time that included millions of system messages. And in conducting that review, we did not identify any evidence whatsoever of improper or illegal activity by market participants.

In fact, we kept coming to the same conclusion: our markets worked.

I think it is important to note that I can give all of these statistics to you because we had technology in place that provided very granular and complete audit trail data at our fingertips on essentially a real-time basis. Our counterparts in the securities industry have not been as fortunate in accessing this kind of information even within months of the market event.

CME Group Example

So if that was what happened, down to the millisecond, what can we learn about what went right?

I think the first conclusion to take away is that price discovery and risk transfer are critically important to a strong financial system.

Throughout the challenging market conditions of May 6th, participants used the liquidity and efficiency of the E-mini S&P 500 futures contracts to hedge exposure to fragile fundamentals in the broader cash market. Although liquidity demand clearly outstripped liquidity supply during the sharpest part of the break and rally, there is strong evidence that the E-mini S&P futures contract was much more liquid than the fragmented underlying stock market. During the flash crash, the volume of E-mini S&P futures, notionally adjusted, was three to four times greater than the SPDR volume at the same time. And the second-by-second trading range, which is an indicator of liquidity, was much tighter. In other words, the E-mini S&P 500 futures market continued to absorb tremendous trading volumes and trade in an orderly fashion even in the face of apparent crisis in spot equity markets where, in many cases, liquidity completely evaporated resulting in transactions executed at preposterous prices.

This leads to my second point about what went right: we gave the market a break.

Unlike the cash market, the decline in the futures market was mitigated by the operation of our proprietary stop logic technology which automatically halted the market for a short period to enable additional liquidity to enter into the futures market. Stop logic caused our matching engine to pause for five seconds while continuing to allow new orders to be entered. At the time the stop logic was triggered, the E-mini S&P ceased its drop, while certain individual stocks and ETFs in the cash market continued their steep decline. Following the halt, the E-mini S&P then rallied sharply, leading the recovery in the broader market. We believe this recovery was positively influenced by our stop logic functionality. This type of functionality is not available in the securities market. Consequently, even while the broad-based derivatives index markets were substantially recovering, there were continued price declines in the securities markets which persisted for minutes. Not seconds.

In general terms, stop logic functionality serves as a “cooling off” period to mitigate artificial market spikes that can occur because of the continuous triggering and trading of stop orders due to insufficient liquidity. While certain equity markets did have volatility controls, those controls were not uniform across exchanges and liquidity pools. And that lack of coordination may have contributed to the market dislocations on May 6th.

Additional mechanisms that exchanges have implemented to curb market volatility are the better known "market-wide circuit breaker" rules. Circuit breaker rules require an automatic halt in trading when pre-determined price thresholds are reached. CME Group currently has circuit breaker rules in effect for our equity index products which are consistent with the 10, 20 and 30 percent market-wide circuit breaker rules in the underlying equity markets. On the day in question, however, the 10 percent circuit breaker was not triggered because the market's break fell short of that trigger point.

In addition to the practices I have just described, CME Group has in place numerous risk and volatility management processes, procedures and systems to preserve the market integrity in light of the many risks associated with maintaining a primarily electronic marketplace. For example, price banding prevents the entry of erroneously price orders and protection points establish automatic limit prices for market and stop orders, preventing them from being filled at significantly aberrant prices when the liquidity is not there to support efficient execution. The absence of this type of functionality in the securities markets led to executions at very aberrant prices that had to be cancelled much later that day.

Third, the world learned on May 6th that market fragmentation can be a serious problem that exacerbates dysfunction during a liquidity event. When the crisis occurred and the NYSE implemented its liquidity replenishment point rules, orders were rerouted to other venues which were themselves liquidity challenged and compromised by the lack of protections against market and stop orders being executed into liquidity vacuums. Had all equity markets had the same stop logic and protection point functionality in place – as we do on the futures side – I think we would have had a very different outcome. The markets still would have been volatile given the market fundamentals and the liquidity demands of that day, but we would not have experienced the same degree of dislocation and the collateral damage of tens of thousands of busted securities trades.

Recommendations

I would like to turn to a few recommendations going forward. We acknowledge the efforts of the CFTC, SEC and the equity exchanges to address these issues in the past year, and we look forward at CME Group to continuing to work with them on further improvements. Although I have spent much of my time today discussing what did go right in derivatives markets, I can assure you we are absolutely committed to further refining our risk management and volatility mitigation technology to benefit both the market as a whole and individual market participants.

So, what do we recommend?

First, we believe that coordinated and appropriately calibrated market-wide circuit breakers are a critical step. Today, the circuit breaker rules we discussed a few minutes ago are triggered based upon 10, 20 and 30 percent declines in the Dow. As I noted, these levels were not breached on May 6th, but clearly a lesser move than 10 percent, coupled with the speed of today's markets, severely roiled the markets and challenged investor confidence on that day. CME Group therefore believes it would be prudent to promptly re-evaluate the current construct. We recommend lowering the circuit breaker thresholds to levels that

would remain infrequently triggered, but would also better protect the market and sustain the confidence of market participants in a period of instability.

Additionally, given today's highly automated market structure and sophisticated information processing technology, less lengthy halts are necessary to allow the market to assimilate information, assess risk and mobilize liquidity.

The Joint CFTC SEC Advisory Committee made a number of recommendations, including supporting the single security circuit breakers for the Russell 1000 stocks and actively traded ETFs that were implemented by the securities exchanges after May 6th. We believe there are important unintended consequences with this approach, as the imposition of single security circuit breakers actually *increases* uncertainty and instability in the market during very volatile conditions.

Many of the ETFs subject to single security circuit breaker rules are based on indexes that also underlie other financial products. Consequently, single security trading halts that would apply to ETFs on broad-based indexes would not be coordinated with the market-wide circuit breakers or with the price limits that currently apply to related index futures and options. In a macro-market event, multiple constituent stocks in an index could be halted without a market-wide circuit breaker being triggered, and individual stocks would be halted and opened on staggered timelines, creating complexity and confusion in understanding the index calculation and the true value of the index. Two key lessons of May 6th are first, that uncertainty damages the sourcing of liquidity and second, that closely linked markets should have coordinated halting mechanisms. The single-security circuit breakers neglect both of these lessons.

There are, in our view, more effective and market-efficient solutions to achieving the objectives of single security circuit breakers that pose significantly less risk of causing collateral distress to the markets and to market participants. Therefore, our second recommendation is that, instead of single-security circuit breakers, we collectively implement consistent rules around price banding, protection points, and stop logic type functionality to mitigate the impact of transitory liquidity gaps. Additionally, given the disruption and uncertainty that erroneous trades create, greater efforts must be devoted to implementing automated controls to ***prevent*** erroneous trades.

On May 6, CME Group did not cancel or price-adjust any trades in our equity index futures complex, primarily because we had automated mechanisms introduced at the trading engine level to mitigate the likelihood of erroneous trades occurring.

Other market centers canceled more than 20,000 trades, leaving market participants exposed and exacerbating uncertainty.

The Joint Advisory Committee has endorsed the establishment of clear rules regarding trade cancellations. We have recommended that such rules should have a bias toward repricing rather than cancellation as we believe our experience shows this approach enhances trade certainty and mitigates exposure, both of which heighten market confidence and support the provision of liquidity. This practice is less disruptive to markets than trade cancellation policies and is broadly supported by market participants.

Market centers that currently employ only trade cancellation policies should examine the benefits of price adjustment policies where practicable. We need to be mindful as well of the fact that participants lay off position risk across markets. Therefore, decisions by one market center to cancel trades can leave participants exposed in other markets, potentially creating reverberating repercussions in the other markets. Price adjustment policies remedy this concern.

So as the events of May 6th demonstrated - in even the most liquid markets - demand for liquidity can at times legitimately overwhelm its supply. I think the takeaway is that we know there will be market shocks, but having sound structures and rules can strengthen the resilience of markets during these turbulent times.

A Final Word about HFT

I would like to leave you with one final thought about May 6th. And that is that we would be remiss to not also stop and discuss the very important role that high frequency traders play in effective markets.

High frequency traders are an important part of daily trading activity in the marketplace and have evolved in response to advancements in technology. In our markets, these traders are often the ones who are making markets and providing liquidity – that is typically the case each day and was the case on May 6th in our equity derivatives products. There is considerable evidence that high frequency traders increase liquidity, narrow spreads and enhance the efficiency of markets. And rather than vilifying this group, as some have, we should establish market structures that promote, rather than discourage, their participation in volatile periods when liquidity is most needed. Many of the issues I've spoken about today are important in that context.

The reality is that speed is going to continue to be a characteristic of our financial markets. As a self-regulating organization, we of course are committed to ensuring that we employ effective risk, volatility and error-mitigation functionality to support high-frequency trading activity in a way that benefits all market participants. However, very careful consideration should be given to any decision to place restrictions on these traders that would be harmful to their participation and result in less efficient and less liquid markets.

We know that liquidity is the best defense against disruptive markets. And, as I conclude my remarks today, I want to make sure we all are mindful not to chase liquidity away.

I want to thank you for your time this afternoon. On behalf of CME Group, we look forward to working with all of you here today to continue to improve financial markets for the benefit of investors here at home and around the world.