TESTIMONY

OF

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EXECUTIVE CHAIRMAN

CME GROUP INC.

BEFORE THE

SUBCOMMITTEE ON SECURITIES, INSURANCE, AND INVESTMENT OF THE

SENATE COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS

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I am Terrence A. Duffy, executive chairman of CME Group Inc. Thank you Chairman Reed and Ranking Member Bunning for inviting us to testify today. You asked us to discuss issues surrounding the activity in the equity markets on Thursday, May 6, 2010, particularly to review the causes and implications of the market activity as well as to identify what policy changes may be necessary to avoid a recurrence of such activity.

CME Group is the world's largest and most diverse derivatives marketplace. We are the parent of four separate regulated exchanges, including Chicago Mercantile Exchange Inc. ("CME"), the Board of Trade of the City of Chicago, Inc. ("CBOT"), the New York Mercantile Exchange, Inc. ("NYMEX") and the Commodity Exchange, Inc. ("COMEX"). The CME Group Exchanges offer the widest range of benchmark products available across all major asset classes, including futures and options on futures based on interest rates, equity indexes, foreign exchange, energy,

metals, agricultural commodities, and alternative investment products. The CME Group Exchanges serve the hedging, risk management and trading needs of our global customer base by facilitating transactions through the CME Globex® electronic trading platform, our open outcry trading facilities in New York and Chicago, as well as through privately negotiated CME ClearPort transactions.

I. Introduction

Since May 6, 2010, CME Group has engaged in a detailed analysis regarding trading activity in its markets on that day. Our preliminary review indicates that our markets functioned properly. We have identified no trading activity that appeared to be erroneous or that caused the break in the cash equity markets during this period. Moreover, no market participant in our markets reported that trades were executed in error nor did the CME Exchanges cancel ("bust") or re-price any transactions as a result of the activity on May 6th. Moreover, the CME markets provided an important price discovery and risk transfer function on that day and served as a moderating influence on the markets.

In the following sections, we discuss: (1) the functioning of and the role played by our markets on May 6, 2010, (2) the existing circuit breaker rules and the need for consistent and transparent rules across markets and (3) CME electronic functionality, particularly CME Stop Price Logic functionality and price banding, among others, which serve to protect our markets. Finally, we have also included certain recommendations as to changes that could avoid a recurrence of this type of event in the future.

II. The CME Markets Functioned Properly on May 6, 2010

a. CME Has Conducted an Initial Review of Detailed Trading Records

CME Group analyzed trading volume and activity throughout May 6 and focused particularly on the activity taking place during the period of 1pm to 2pm Central Time. Total volume in the June E-mini S&P futures on May 6th was 5.7 million contracts, with approximately 1.6 million or 28% transacted during the period from 1pm to 2pm Central Time. During that hour, the market traded in a range of 1143.75 to 1056, or 87.75 points - beginning the hour at approximately 1142 and ending the hour at approximately 1113. More than 250 CME Globex execution firms and 9,000 User IDs were active in the market during this period of time.

During most of that hour, the bid/ask spread was a tick wide (.25 points) and the market traded in a largely orderly manner despite the significant sell off and subsequent rally. At approximately 1:45:28, following a sharp 12.75 point decline over a period of approximately 500 milliseconds on the sale of 1100 contracts by multiple market participants, the bid/ask spread widened to 6.5 points or 26 ticks for less than one millisecond.

At that point, one of CME Globex's risk management functionalities, a CME Globex Stop Price Logic event, which is discussed in more detail below, was triggered. As a result, the market was automatically paused for five seconds to allow liquidity to come into the market. The market subsequently reopened at 1056.75, and thereafter rallied more than 40 points to 1097 in the following three minutes.

The Market Regulation Department reviewed a significant amount of activity during this period, a period that included more than 3 million system messages, and, in particular, examined the activity of participants whose trading activity during the one-hour period was significant or otherwise warranted further review. The review conducted by Market Regulation staff has not identified any evidence of improper or illegal activity by market participants.

b. CME Markets Provided an Important Price Discovery and Risk Transfer Function on May 6

From a broader perspective, the cumulative record of May 6 trading activity underscores the fact that CME's futures markets, due to their high level of liquidity, provided an important price discovery and risk transfer mechanism for all market participants on that day.

The equity index futures contracts traded on CME Group designated contract markets provide an essential risk management function, allowing investors to hedge their exposure against a portfolio of shares or equity options. The most significant equity index futures contract traded on the CME Group Exchanges is the E-mini S&P 500 futures contract. In 2009, the E-mini contract traded over 556 million contracts, which represents an average daily volume in excess of 2.2 million contracts, making the E-mini S&P futures contract the most liquid equity index futures contract worldwide. Throughout the challenging market conditions on May 6, market participants utilized the liquidity and efficiency of the E-mini S&P 500 futures contracts to meet their risk management needs; the contract effectively facilitated customer demand to hedge

exposure to a declining broader market and, as will be shown below, represented a moderating factor during the session.

The primary purposes of futures markets are to provide an efficient price discovery and risk management mechanism. In particular, the academic literature underscores the efficacy of futures markets as a tool of price discovery. According to one study, "[e]mpirical results confirm that futures market plays a price discovery role, implying that futures prices contain useful information about spot prices."[1] As such, stock index futures frequently represent the venue in which price information is revealed first, generally followed closely by spot markets. In fact, most researchers find that "futures lead the cash index returns, by responding more rapidly to economic events than stock prices."[2]

Futures contracts, by design, provide an indication of the market's view of the value of the underlying stock index. Casual observation may lead to the conclusion that the E-mini S&P futures prices appeared to lead the decline in the cash market. However, the decline was consistent with declines in the most complementary equity derivative products, ETFs based on the same index, trading in the cash market. Unlike the cash market, the decline in the futures market was then mitigated by the operation of our risk management technology which halted the market for a short period to enable additional liquidity to enter into the futures market. Attached as Exhibit 1 is a chart which illustrates the comparative value of the E-mini, traded on the futures

[1] See Floros, C. and Vougas, D. V. (2007) Lead-Lag Relationship between Futures and Spot Markets in Greece: 1999-2001, *International Research Journal of Finance and Economics*, 7, 168-174.

[2] Kavussanos, Manolis G., Visvikis, Ilias and Alexakis, Panayotis, The Lead-Lag Relationship between Cash and Stock Index Futures in a New Market. European Financial Management, Vol. 14, Issue 5, pp. 1007-1025, November 2008.

market, as compared to the equities markets. The ETF most comparable to the E-mini S&P 500 futures is the SPDR S&P 500 ETF Trust (SPY). The chart demonstrates that the E-mini S&P moved virtually in tandem with the comparable cash instrument until the moment when our Stop Price Logic was triggered which caused our matching engine to pause for 5 seconds while continuing to allow new orders to be entered. At the time the Stop Price Logic was triggered, the E-mini S&P ceased its drop, while certain individual stocks in the cash market continued their steep decline. Following the halt, the E-mini S&P then rallied sharply. We believe this recovery was positively influenced by our Stop Price Logic functionality which stabilized market activity. This type of functionality is not available in the securities market. Consequently, even while the broad based index markets – SPYs and CME E-mini S&P – were substantially recovering, there were continued price declines in individual stocks which persisted for minutes (not seconds).

More specifically, to illustrate this point, we reviewed the period from 13:30 to 14:00 (CT) during which the market activity occurred as depicted in Exhibit 2. E-mini S&P 500 futures were declining after 13:30 (CT) followed by spot equity markets including Proctor & Gamble (PG), 3M (MMM) and Accenture (ACN). The June 2010 E-mini S&P 500 futures traded at its low of 1,056.00 at 13:45:28 (CT), at which point the Stop Price Logic functionality was triggered halting the decline, and the market rallied following the 5-second halt. PG, MMM and ACN continued to slide even after futures hit their low and began to recover. Those stocks were put into a reserve mode by the New York Stock Exchange (NYSE) per its Rule 1000(a), Liquidity Replenishment Points, at 13:45:52, 13:50:36, 13:46:10 (CT), respectively; however, these stocks continued to decline. We believe that this decline continued because orders were re-routed to possibly less liquid security trading venues which were not coordinated with NYSE Rule

1000(a). PG printed a low of $39.37 at 13:47:15 (CT); MMM printed a low of $67.98 at 13:45:47 while ACN printed a low of $0.01 at 13:47:54 (CT). Thus, the E-mini S&P 500 futures were rallying while PG, MMM and ACN continued to decline.

As stated above, we believe that this temporary de-linkage between the futures and stock markets may be attributed to inconsistent rules across the equity markets which enabled the stocks to decline even further.

The trading activity during this time period also evidences that the futures markets provided an important source of liquidity which served as a moderating influence in the markets. There is strong evidence that the E-mini S&P futures contract was much more liquid than the fragmented underlying stock market on May 6. During the period between 1:40 and 2:00 CST, the volume of E-mini S&P futures (notionally adjusted) was 3 to 4 times greater than the SPY volume and, at the peak of the market's volatility, was to 8 to 10 times greater. As noted above, E-mini S&P 500 futures slightly lead SPYs during the downturn. Both E-mini S&P 500 futures and SPDRs turned around near 13:45:28. But, as shown in Exhibit 1, the rally in futures was relatively consistent and orderly in contrast to the rally in SPYs which was very uneven and was highlighted by a significant increase in cash equity market spreads.

The second-by-second trading range, which is an indicator of the liquidity in the market, was much tighter in E-mini S&P 500 futures than in the comparable equity product, the SPYs. In examining the ratio of the futures trading range relative to the SPYs (SPDR) trading range in one-minute intervals between 13:30 and 14:00 (CT), the respective trading ranges were very

similar at the beginning of the period. By the height of the incident near 13:45-13:50, however, the ratio had fallen to as low as 20% that of the SPDR range. While all the markets were less liquid than in normal times, the liquidity in the futures market degraded much less than in the SPY market (which, in turn, degraded much less than the individual stocks, especially those stocks that are thinly traded.) This suggests that the futures order book was much deeper and more resilient than the SPDRs order book. In other words, the E-mini S&P 500 futures market continued to absorb trading volume and trade in an orderly fashion even in the face of apparent crisis in spot equity markets when liquidity was most sorely needed. As such, futures represented a moderating factor throughout the incident.

If the futures market had not been available as an alternative, the selling would have manifested itself through another venue, potentially in a less liquid market, such as the underlying stock market or the OTC derivatives market. The relative tightness of the spread in the futures market underscores the fact that a concentration of liquidity supported the important price discovery and risk transfer role of the futures market.

III. Circuit Breaker Levels Should be Reviewed In View of May 6 and Rules Should be Consistent Across Markets.

One of the mechanisms that exchanges have implemented to curb market volatility are "circuit breaker" rules. Circuit breaker rules require an automatic halt in trading when pre-determined price thresholds are reached. CME Group Exchanges currently have circuit breaker rules in

effect for equity index products which are consistent with the circuit breaker rules in the underlying equity markets.

Circuit breaker rules were originally introduced following the September 1987 market crash. The circuit breakers were implemented uniformly across all equities and options exchanges and were set at a fixed price level tied to the DJIA. This rule was embodied in NYSE Rule 80B.

On October 27, 1997, the circuit breakers were triggered for the first time and the circuit breaker rules were subsequently modified to employ percentage declines of 10, 20 and 30% in the DJIA established at the start of each calendar quarter in lieu of the fixed point triggers previously used. That rule remains in effect.

In addition to the coordinated circuit breakers, CME adopted price limit rules for its equity index contracts. The price limit structure and levels changed several times as the Exchange acquired more experience and as the trading halt rules in the equity market were modified.

In January 2008, however, CME harmonized its price limit percentage thresholds to be fully consistent with the percentage thresholds reflected in NYSE Rule 80B (and also consistent with the methodology employed by the CBOT with respect to the DJIA futures). CME did, however, retain the references to the specific stock index that is the subject of the futures contract rather than tying these limits to movements in the DJIA, meaning, for example, that the E-mini S&P 500 price limits are tied to price movements in the related index.

CME implements an unconditional futures trading halt in the equity index futures when the primary stock market is halted, regardless of whether a particular index product has hit a limit or not. CME also enforces a 5% limit bid or offer policy during overnight electronic trading hours; if equity index futures are locked limited at 8:15 a.m. Central Time ("CT") and remain so at 8:25

a.m. CT in the lead month futures contract, there will be a trading halt in effect until the commencement of regular trading hours (floor and electronic trading). During the trading halt, the Exchange will provide an Indicative Opening Price of the re-opening of trading on CME Globex, if applicable. If the lead month futures contract is no longer locked limit at 8:25 a.m. CT, trading will continue with the 5 percent limit in effect. At 8:30 a.m. CT, the 5 percent overnight electronic trading hours limit no longer will be applicable.

On May 6, the declines in the DJIA were just short of 10% at a time of day when the 20% trigger was in effect. As a result, the circuit breakers in the primary and the futures markets were not triggered. Accordingly, we believe that the current circuit breaker levels of 10, 20 and 30 percent, the duration of the halt and the time of day at which such triggers are applicable, should be reevaluated in light of current market conditions to determine whether any changes are warranted

After May 6, CME staff reviewed the relevant processes and rules across the CME and equities exchanges to determine what protections existed in the operating rules of the numerous equities platforms in the event of a market disruption. Due to the fragmented nature of the equity markets, it appears to us that there is a lack of consistency across this market which could exacerbate issues in time of market stress.

For instance, as noted above, we believe that the lack of consistency and coordination among equity platforms in the establishment of circuit breakers for individual stocks led to extreme market disruptions; when the NYSE rule circuit breaker rule was invoked with respect to trading

in individual stocks, order flow circumvented the NYSE market and trading continued on other platforms which did not have comparable protections. Consequently, as a result of the lack of liquidity on these other platforms, trading in those individual stocks suffered significantly.

We also note that in the aftermath of the May 6 incident, there was significant confusion in the equity markets over the cancellation or "busting" of trades. The standards for cancellation of trades are not consistent or transparent across the equity markets as a whole. At the CME, we have clear standards for the implementation of "no bust" ranges (i.e., ranges within which trades may not be cancelled) and error trades. These policies are clearly set forth in our rulebook and are posted on our website.

We believe that, to ensure the integrity of the market and to promote market confidence among users, there must exist a clearly defined rule set which is transparent to market users, understood by market users and which is consistent across all markets.

IV. CME Has Risk Management Controls to Mitigate the Potential for Disruption of its Markets

In addition to the circuit breaker and price limit rules described above, CME has in place numerous risk management processes, procedures and systems to preserve the integrity of its market in light of the many risks associated with maintaining a primarily electronic market. For example, CME is the only exchange in the world that requires pre-execution credit controls which become mandatory in June 2010. Appended as Exhibit 3 is a detailed list and description

of the multitude of controls that the CME employs on its CME Globex system, including credit controls, messaging volume controls and risk protection policies and procedures.

There are certain risk protection tools employed by the CME which are important to note individually and which are relevant to today's discussion. One of these tools, CME Globex Stop Price Logic functionality, was employed on May 6 – its operation and effect are also described below. In addition, CME Exchanges have a number of other policies and procedures, such as our messaging policy and practice of registering Automated Trading Systems ("ATS") that provide us with the tools to monitor and maintain orderly administration of the electronic markets and provide real time surveillance and oversight of trading activity.

a. Stop Price Logic Functionality

The CME Globex system has a Stop Price Logic functionality which serves to mitigate artificial market spikes that can occur because of the continuous triggering, election and trading of stop orders due to insufficient liquidity. If elected stop orders would result in execution prices that exceed pre-defined thresholds, the market automatically enters a brief reserved state for a predetermined time period, ranging from 5 – 10 seconds. During this period, no orders are matched but new orders other than market orders may be entered and orders may be modified and cancelled. The momentary pause that occurs when Stop Price Logic is triggered allows market participants the opportunity to provide liquidity and allows the market to regain equilibrium, thereby mitigating the potential for disruptive market moves.

The stop spike price and time parameters in the E-mini S&P futures are 6 index points (approximately one-half of one percent of the S&P 500 index value) and 5 seconds, respectively.

The Stop Price Logic was triggered on May 6th in the E-mini S&P 500 equity index. At 1:45:27, one second prior to going into reserve state, the front month E-mini S&P 500 equity index futures contract was trading just under the 1070.00 level. Multiple parties entered the market selling and taking the market down to 1062.00. There was a stop order to sell 150 contracts at 1062.00 which moved the markets to 1060.25, and elected additional stops that were filled down to 1059. The trades at 1059 triggered another 150 lot stop at 1059.00 which was executed down to a level of 1056.00, which would have elected additional stops.

However, at this point, following the 6 point move from 1062 to 1056, the front month E-mini S&P 500 equity index futures market went into reserve state as a result of Stop Price Logic functionality being triggered at 13:45:28. The market came out of this reserve state five seconds later. As a result of this brief suspension of trading, the decline in the E-minis was halted and the market came out of the reserve state with an initial price of 1056.75, after which it rallied sharply. Consequently, we believe that the triggering of this functionality served its intended purpose of allowing market participants the opportunity to provide liquidity and permitting the market to regain its equilibrium.

b. Price Banding Functionality

To ensure fair, stable and orderly markets, CME Globex subjects all orders to price verification using a process called price banding. The platform utilizes separate mechanisms for futures

price banding and options price banding. Price banding prevents the entry of erroneous orders such as a bid at a price well above the market or an offer at prices well below the market which could trigger a sequence of market-moving trades that require subsequent cancellations. In order to determine the level of price banding, CME Exchanges use the most current and relevant market information, including, for futures, trades, best bid and offer and implied bid and offer or indicative opening price, and for options, last price of an option or spread and a theoretical options price based on options pricing algorithms.

c. Protection Points for Market and Stop orders

This CME Globex functionality automatically assigns a limit price (Protection Point) to futures market orders and stop orders to preclude the execution of these types of orders at extreme prices in situations where there is insufficient liquidity to support the execution of the order within an exchange-specified parameter of the current market.

The Protection Point values vary by product, and in the E-mini S&P futures the Protection Point is established at 3 index points. The CME Globex system calculates the limit price for a Market Protected Order by applying the Protection Point value to the best bid or offer price (depending on the order's side of market) and by applying the Protection Point value to the trigger price for a Stop Protected Order. Any unmatched quantity remaining for a Market Protected or Stop Protected Order after it is executed to the Protection Point limit becomes a Limit Order at the Protection Point limit price.

d. **Maximum Order Size Protection**

Maximum order size functionality on CME Globex prohibits entry of an order into the trading engine which exceeds a pre-determined quantity. For E-mini S&P 500 futures, the order size is 2,000 contracts. This functionality provides protection against the so-called "fat finger" trades.

In addition, we would like to point out certain risk management practices and measures we take which, in addition to the risk management tools noted above, serve to mitigate potential problems that could result from electronic trading, particularly with high frequency trading.

e. **Messaging Policies**

CME has in place certain controls and policies which are designed to avoid problems associated with excessive messaging by market participants. CME has instituted a CME Group Messaging Policy that encourages market participants to trade and quote appropriately without harming market liquidity or performance. Inefficient messaging slows system performance, negatively impacts other market participants and increases system capacity requirements and costs. To mitigate this, CME has implemented automated controls which monitor for excessive new order, order cancel and order cancel/replace messaging. If a session exceeds a designated message per second threshold over a three-second window, subsequent messaging will be rejected until the average message-per-session rate falls below this threshold.

CME has also instituted a policy of fining for excessively high messaging rates. This policy benefits all customers trading on CME Globex by discouraging excessive messaging abuses, which in turn helps to ensure that CME Globex maintains the responsiveness and reliability of the system. Under the CME Globex Messaging Policy, each clearing member firm must not

exceed product-specific benchmarks, individually tailored to the valid trading strategies of each market. CME Group calculates benchmarks based on a per-product volume ratio, defined as the number of messages submitted for each executed contract in a given product.

f. Registration of ATS

All Automated Trading Systems ("ATS") using CME Globex are required to identify themselves as an "ATS" and register with the CME Group Exchanges. Subsequent to their registration, the CME Group Exchanges are able to monitor the trading activity of ATSs on both a real time and post-trade basis. CME has required ATS registration for its equity index products since 2006. This policy has now been expanded to ATS' for all products and we currently have over 10,000 ATS registered.

ATSs are treated like any other market participant and are subject to the messaging policy. This, in turn, enables CME to prevent a malfunctioning trading system from impacting our markets.

V. High Frequency Trading Enhances Liquidity

An important issue raised in this discussion is the contribution of high frequency traders ("HFTs") to the current situation and their future role in the markets. As recently described in the SEC's Concept release on market structure, high frequency trading was identified as one of the most significant market structure developments in recent years. Although HFT is not clearly defined, "it typically is used to refer to professional traders acting in a proprietary capacity that engage in strategies that generate a large number of trades on a daily basis."

CME believes that HFTs play an important role in the markets, particularly when such activities are engaged in the types of risk management procedures detailed in the previous section. HFTs are an important part of daily trading activity in the marketplace and have evolved in response to advancements in technology. This represents the natural evolution of technological advancements and improvements in the marketplace and the percentage of trading volume attributable to HFTs will likely continue to increase in the future. There is evidence that HFTs increase liquidity and transparency in the marketplace and narrow spreads which allows investors to buy and sell securities at better prices and at lower costs.

It is also important to note that not all HFTs are alike. A significant proportion of HFTs on the CME promote liquidity by providing continuous markets in our products. As illustrated by the events of May 6, in analyzing the role of several HFTs, a majority of those entities' trading executed during the relevant one-hour period was related to the firm's market making activities. Thus, before considering restrictions on HFT activity, consideration should be given to the beneficial role played by HFTs in providing liquidity during normal market activity as well as during times of increased market stress.

The use of high frequency trading by proprietary trading firms, investment banks, hedge funds and index traders, among others, has made the marketplace more efficient and competitive for all market participants. Careful consideration should be given to any decision to place significant restrictions or limitations on HFTs that would be harmful to the marketplace and result in less efficient and less liquid markets. It is also important to note that automated trading or algorithmic trading has its origins in Europe. Accordingly, efforts to place limits or impose regulatory burdens on HFTs in the United States may encourage HFTs to shift the trading they currently

conduct in the United States to Europe and other foreign jurisdictions that are already well-equipped to handle additional growth in both equities and futures.

As noted above, CME Globex employs many risk management policies and procedures which assist in the mitigation of risk associated with any type of electronic trading, including that of HFTs. In addition, the CME Group Exchanges are proactive in monitoring the trading activity of HFT entities. In sum, CME believes that HFTs play an important role in the markets, particularly when such activities are engaged in with the types of risk management procedures detailed in the previous section.

VI. Recommendations

As noted previously, CME has endeavored to extensively examine the activity in our markets on May 6, 2010. Upon review of the activity, to this point, we believe that there are potential changes which would improve the functioning of the markets during times of severe stress.

Throughout this process we have worked closely with our regulator, the CFTC, as well as with other regulators not only to identify the causes of significant volatility on May 6, but also to assist in providing thoughts and recommendations for market improvement. Of course, as we continue to study the events further, we would be happy to contribute our further thoughts and recommendations.

- Circuit breakers, including circuit breakers for individual stocks such as that implemented by the NYSE, must be harmonized across markets. As we stated above, we believe that

consistency and transparency across markets benefits the market by providing clarity in times of market stress. In reviewing the trading activity of May 6, we believe that the lack of consistency and coordination across markets exacerbated the decline in price of certain individual stocks. The NYSE exercised its Liquidity Replenishment Rule (i.e., its individual stock "circuit breaker" rule) to slow down its markets; Orders were then directed to other less liquid electronic trading venues which had no such rule.

- Stop Price Logic functionality should be adopted across markets, on a product by product basis, to prevent cascading downward market movements. As evidenced by the trading activity on May 6, we believe that our Stop Price Logic functionality provided the opportunity to source needed liquidity at a crucial time and contributed to allowing the market to gain its equilibrium.

- The current circuit breaker levels of 10, 20 and 30 percent, the duration of the halt and the time of day at which such triggers are applicable, should be reevaluated in light of current market conditions to determine whether any changes are warranted. A comprehensive, coordinated and quantitative review of the market wide circuit breaker levels and duration of pause should be undertaken across all market centers and trading venues supporting equity based products, including cash equities, single name and index options, single stock futures, index futures and options on index futures and total return swaps and structured products. Any effort should be examined and coordinated across markets and the input of all market operators should be sought.