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June 3, 2010

Ms. Elizabeth M. Murphy  
Secretary  
Securities and Exchange Commission  
100 F Street, N.E.  
Washington, D.C. 20549

Re: SRO Single Stock Circuit Breaker Proposals (File Nos. SR-BATS-2010-014, SR-BX-2010-037, SR-NASDAQ-2010-061, SR-NSX-2010-05, SR-NYSE-2010-39, SR-NYSEArca-2010-41, SR-NYSEAmex-2010-46, SR-ISE-2010-48, SR-EDGA-2010-01, SR-EDGX-2010-01, SR-CBOE-2010-047, SR-FINRA-2010-025)

Dear Ms. Murphy:

The Investment Company Institute<sup>1</sup> is writing to provide comments on the proposed single stock circuit breakers filed by the national securities exchanges and the Financial Industry Regulatory Authority ("FINRA") in response to the market events of May 6. The events of May 6 highlighted the need to implement a trading pause for individual securities in times of market stress to mitigate instances of sudden market volatility. The proposed circuit breakers are designed to implement such a pause.

The Institute strongly supports single stock circuit breakers. The proper functioning of the securities markets is critical for Institute members, who are investors of over \$11 trillion of assets on behalf of almost 90 million individual shareholders. Registered investment companies and their shareholders have a strong interest in ensuring that the securities markets are highly efficient and that the regulatory structure that governs the securities markets promotes such efficiency.

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<sup>1</sup> The Investment Company Institute is the national association of U.S. investment companies, including mutual funds, closed-end funds, exchange-traded funds (ETFs), and unit investment trusts (UITs). ICI seeks to encourage adherence to high ethical standards, promote public understanding, and otherwise advance the interests of funds, their shareholders, directors, and advisers. Members of ICI manage total assets of \$11.97 trillion and serve almost 90 million shareholders.

While the proposed circuit breakers are a meaningful first step, other inefficiencies in our current market structure highlighted by the events of May 6 also must be addressed without delay. Specifically, there is an immediate need to examine: (1) procedures for resolving clearly erroneous trades; (2) the use of market orders; (3) the inconsistent practices employed by exchanges to address major price movements in stocks; and (4) the lack of coordination across markets in the event of a market disruption. In addition to these specific issues, the issues addressed by the Commission's concept release on the current U.S. equity market structure should be examined to further improve our markets.<sup>2</sup>

## **I. Circuit Breaker Proposals**

Under the proposed rules, trading in a stock would pause across U.S. equity markets for a five-minute period in the event that a stock experiences a ten percent change in price over the preceding five minutes. The circuit breaker would be in effect only from 9:45 a.m. to 3:35 p.m. Eastern Time. The circuit breakers would first be implemented via a pilot program consisting of the stocks comprising the S&P 500 index. We understand, however, that the parameters of the pilot are subject to change and that the scope of the pilot will expand beyond S&P 500 securities to include other securities such as exchange-traded funds ("ETFs") (discussed below). The pilot program would last until December 10, 2010.

At this time, and without sufficient data or experience to fully assess the operation of the proposed circuit breaker in times of market stress, we do not have a definitive view whether the proposed parameters will accomplish the Commission's goal of addressing temporary and severe dislocations in the securities markets. We support the Commission's approach of using the pilot period "to make appropriate adjustments to the parameters or operation of the circuit breaker as warranted based on ... experience."<sup>3</sup> It is clear that the implementation of the circuit breakers will entail addressing several complex issues regarding its operation.<sup>4</sup> We therefore urge the Commission to work closely with all market participants throughout the pilot program to resolve any issues that may arise. To that end, the Institute will supplement our views on the pilot program as necessary.

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<sup>2</sup> See SEC Release No. 61358 (January 14, 2010), 75 FR 3594 (January 21, 2010) (Concept Release on Equity Market Structure), available at <http://www.sec.gov/rules/concept/2010/34-61358.pdf>. See also Letter from Karrie McMillan, General Counsel, Investment Company Institute, to Elizabeth M. Murphy, Secretary, Securities and Exchange Commission, dated April 21, 2010.

<sup>3</sup> See, e.g., Testimony of Chairman Mary L. Schapiro, Examining the Causes and Lessons of the May 6<sup>th</sup> Market Plunge, before the Subcommittee on Securities, Insurance, and Investment of the United States Senate Committee on Banking, Housing, and Urban Affairs, May 20, 2010, available at <http://www.sec.gov/news/testimony/2010/ts052010mls.htm>

<sup>4</sup> For example, the opening and re-opening processes for securities after a pause, the status of existing orders once a pause goes into effect, and how information about imbalances will be disseminated, among other things, all have yet to be fully resolved.

## II. Inclusion of Exchange-Traded Funds in Circuit Breaker Pilot

The May 6 market event impacted both individual securities and ETFs. As a result of the severe market decline, many trades were cancelled according to the securities markets' "clearly erroneous rules," which provide the various securities exchanges with the ability to cancel trades effected at prices that were sharply divergent from prevailing market prices. For trades effected on May 6, the exchanges determined to cancel any trades effected from 2:40 p.m. to 3:00 p.m. at prices 60 percent away from the last trade at or before 2:40 p.m. ETF trades comprised a majority of the cancelled trades - approximately seventy percent of the trades according to the joint CFTC-SEC preliminary report on the May 6 events.<sup>5</sup>

Given the impact on ETFs of the market events on May 6, we believe it is imperative that ETFs be included in the circuit breaker pilot program as soon as possible. We are encouraged by the Commission's recognition that ETFs should soon be part of the pilot.<sup>6</sup> We are concerned, however, that if circuit breakers exist for individual securities contained in an ETF's basket, but not for the ETFs themselves, ETFs could again suffer disproportionately during a market event similar to that of May 6.

Of immediate concern is the initial pilot program's failure to include ETFs that track the S&P 500 or other indices with substantially overlapping securities.<sup>7</sup> The market price of an ETF is typically highly correlated to the market price of its basket of component securities. Under normal circumstances, ETFs will maintain this correlation even when trading has been halted for one or two component securities. An ETF may experience a slight deviation from the price of its basket because of the challenge of pricing the non-trading security; the ETF's market makers may also slightly widen the spread on the ETF to account for the risk associated with uncertain pricing of the non-trading security. Once the security begins trading again, the ETF price will typically realign with its basket in short order.

As illustrated on May 6, however, when multiple underlying securities experience trading halts or slowdowns (*i.e.*, the NYSE going into "slow mode"), the correlation between the prices of an ETF and its underlying basket may experience more severe dislocation.<sup>8</sup> This scenario could repeat itself if circuit breakers on several S&P 500 securities are triggered before ETFs containing those securities are

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<sup>5</sup> See Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issues, Preliminary Findings Regarding the Market Events of May 6, 2010, dated May 18, 2010, available at <http://www.sec.gov/sec-cftc-prelimreport.pdf>.

<sup>6</sup> See, *e.g.*, Testimony of Chairman Mary L. Schapiro, *supra* note 2 (stating that the pilot program's scope should "expand ... to securities beyond the S&P 500 (including ETFs) as soon as practicable.").

<sup>7</sup> A related concern is that the proposed circuit breaker pilot is not coordinated across other exchange-traded instruments whose value is correlated to securities included in the pilot, such as futures and options.

<sup>8</sup> See Appendix, "Effect of Aberrant Trading on May 6 on ETFs," for a more detailed discussion of ETF performance on May 6.

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included in the pilot program. We therefore urge the Commission to include in the pilot program, as soon as possible, ETFs that track the S&P 500 or indices with substantially overlapping securities. As additional stocks are added to the circuit breaker pilot, ETFs containing those securities also should be added at the same time.<sup>9</sup> Additionally, while we believe it is appropriate for the pilot program to apply the same circuit breaker triggers to ETFs initially (*i.e.*, ten percent change in price over the preceding five minutes), we urge the Commission and exchanges to use the pilot program to consider whether a different trigger is appropriate for ETFs.

\* \* \* \* \*

If you have any questions on our comment letter, please feel free to contact me directly at (202) 326-5815, Ari Burstein at (202) 371-5408, or Mara Shreck at (202) 326-5923.

Sincerely,

/s/ Karrie McMillan

Karrie McMillan  
General Counsel

cc: The Honorable Mary L. Schapiro  
The Honorable Kathleen L. Casey  
The Honorable Elisse B. Walter  
The Honorable Luis A. Aguilar  
The Honorable Troy A. Paredes

Robert W. Cook, Director  
James Brigagliano, Deputy Director  
Division of Trading and Markets

Andrew J. Donohue, Director  
Division of Investment Management  
U.S. Securities and Exchange Commission

Appendix

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<sup>9</sup> Consistent with this approach, because closed-end funds are also exchange traded products, as securities in which they invest are added to the pilot, closed-end funds whose portfolios are substantially comprised of these securities also should be added to the pilot.

**Appendix**  
**Investment Company Institute**  
**Effect of Aberrant Trading on May 6 on ETFs**

On Thursday, May 6, 2010, the U.S. securities markets experienced a brief but precipitous decline in securities traded on exchanges. This market event impacted both individual securities and exchange traded funds (“ETFs”). As a result of the decline, many trades were cancelled according to the securities markets’ “clearly erroneous rules,” which provide the various securities exchanges with the ability to cancel trades effected at prices that were sharply divergent from prevailing market prices. For trades effected on May 6, the exchanges determined to cancel any trades effected from 2:40 p.m. to 3:00 p.m. at prices 60 percent away from the last trade at or before 2:40 p.m. ETF trades comprised a majority of the cancelled trades; approximately seventy percent according to the joint CFTC/SEC preliminary report on the May 6<sup>th</sup> events. Following are several hypotheses for the predominance of ETF trades being cancelled as compared to those of individual securities. It is unclear how many factors, or how the confluence of those factors, caused the aberrant trading or contributed to the large number of cancelled ETF trades. *There is no indication, however, that ETFs themselves (i.e., the ETF product) were the cause of, or a contributing factor to, the market decline.*

**I. Background on ETFs**

An ETF is an investment company whose shares are traded intraday on stock exchanges at market-determined prices. ETFs publish information about their portfolio holdings daily. Each business day, an ETF publishes a “creation basket,” a specific list of names and quantities of securities and/or other assets designed to track the performance of the portfolio as a whole. ETF shares are created when an “authorized participant,” typically a large institutional investor such as a market maker, provides the daily creation basket to the ETF in exchange for a “creation unit” that consists of a specified number of ETF shares. The authorized participant/market maker can either keep the ETF shares or sell them on the secondary market. ETF shares may be redeemed when an authorized participant/market maker returns the specified number of shares in the creation unit to the ETF, in exchange for the daily “redemption basket”—a set of specific securities and/or other assets contained within the ETF’s portfolio.

The price of an ETF share on the secondary market is influenced by the forces of supply and demand. While imbalances in supply and demand can cause the price of an ETF share to deviate from its net asset value (“NAV”), substantial deviations tend to be short-lived. Two primary features of an ETF’s structure promote trading of an ETF’s shares at a price that approximates the ETF’s NAV: portfolio transparency and the ability for authorized participants/market makers to create or redeem ETF shares at NAV at the end of each trading day.

ETFs offer transparency by publishing their creation baskets daily. In addition, ETFs contract with third parties (typically market data vendors) to calculate a real-time estimate of an ETF’s current value, often called the Intraday Indicative Value (“IIV”), using the portfolio information an ETF

publishes daily. IIVs are disseminated at regular intervals during the trading day (typically every 15 to 60 seconds). Investors can observe any discrepancies between the ETF's share price and its IIV during the trading day and when a gap exists between the ETF share price and its IIV (or other estimate of the ETF's underlying value), investors may decide to trade in either the ETF share or the underlying securities that the ETF holds in its portfolio in order to attempt to capture a profit. This trading can help to narrow that gap either by moving the price of the ETF share closer to its IIV or moving the prices of the underlying securities so that the IIV moves closer to the price of the ETF share.

The ability of authorized participants/market makers to create or redeem ETF shares at NAV at the end of each trading day also helps an ETF trade at market prices that approximate the underlying market value of the portfolio. When a deviation between an ETF's market price and its NAV occurs, authorized participants/market makers may buy or sell creation units at NAV to capture a profit. These actions help keep the market-determined price of an ETF's shares close to its NAV.

## **II. Importance of Properly Functioning Securities Markets and an Efficient Market Structure**

The large and sudden price dislocations experienced on May 6 and the subsequent number of ETF trades that were cancelled were, at least in part, the result of flaws and inefficiencies in the current U.S. market structure. As discussed below, due to the nature and composition of ETFs, these securities may be more susceptible to sudden imbalances of supply and demand and sharp movements in prices than individual stocks. Changes to the structure of the markets already being discussed in response to the events of May 6 (such as circuit breakers) should address some of the issues that contributed to the large number of cancelled ETF trades if a similar event occurs again.

### ***A. Fragmented Trading Rules Led to Severely Limited Liquidity, Which Negatively Impacted ETFs***

The securities markets are highly automated and have become increasingly complex and fragmented, particularly over the last few years. The rules governing the markets, however, are inconsistent and have not kept pace with the level of complexity and growth of trading venues. For example, while the trading of ETFs has shifted from the traditional specialist floor-based model to one driven solely by electronic market makers, controls, such as human intervention to override algorithms, have not kept pace with the speed of executions. These inconsistencies were a contributing factor to the May 6 trading and subsequently to the number of cancelled ETF trades.

Specifically, during the afternoon of May 6, the NYSE went into "slow mode" after speed bumps, *i.e.*, "liquidity replenishment points" ("LRPs") were triggered due to the sharp decline in many securities. LRPs are designed to reduce volatility by temporarily converting the execution of orders from an automated market to a manual auction market when a price movement of a particular size in a stock is reached.

Many of the stocks comprising ETFs are NYSE-listed stocks. Despite some of these stocks being in slow mode, however, Regulation NMS permitted other securities markets to ignore quotes on the NYSE, effectively shutting off a large pool of liquidity. In addition, the ETFs themselves, which are predominantly listed on NYSE Arca and NASDAQ, were still being executed on a fast and automated basis.<sup>1</sup>

At the same time the NYSE was in slow mode, several exchanges declared “self help” against NYSE Arca, where ETF trading volume is highly concentrated. Declaring “self help” is permitted under Regulation NMS when one exchange believes that another exchange is experiencing systems problems. “Self help” allowed these exchanges to exclude the quotations of NYSE Arca from their determinations of whether any other exchange had a better price to which they must route orders for execution.

The combination of the NYSE going slow and other exchanges declaring self help against NYSE Arca severely limited liquidity on those exchanges that continued to execute orders in an automated fashion. For a group of 120 relatively large, liquid ETFs tracked by Investment Technology Group (ITG), time-weighted average bid depth and ask depth measured at 15 second intervals of the displayed limit order book for the first ten levels of the book dropped precipitously during the twenty minute period from 2:40 p.m. to 3:00 p.m. (Figures 1 and 2).<sup>2</sup> These measures indicate that liquidity for these ETFs essentially disappeared during this timeframe on May 6<sup>th</sup>. Bid depth declined rapidly from about 350,000 shares at 2:40 p.m. to a low of around 20,000 shares at 2:49:45 p.m. Bid depth slowly moved back up over the remainder of the day to around 200,000 shares before dropping off at the close.

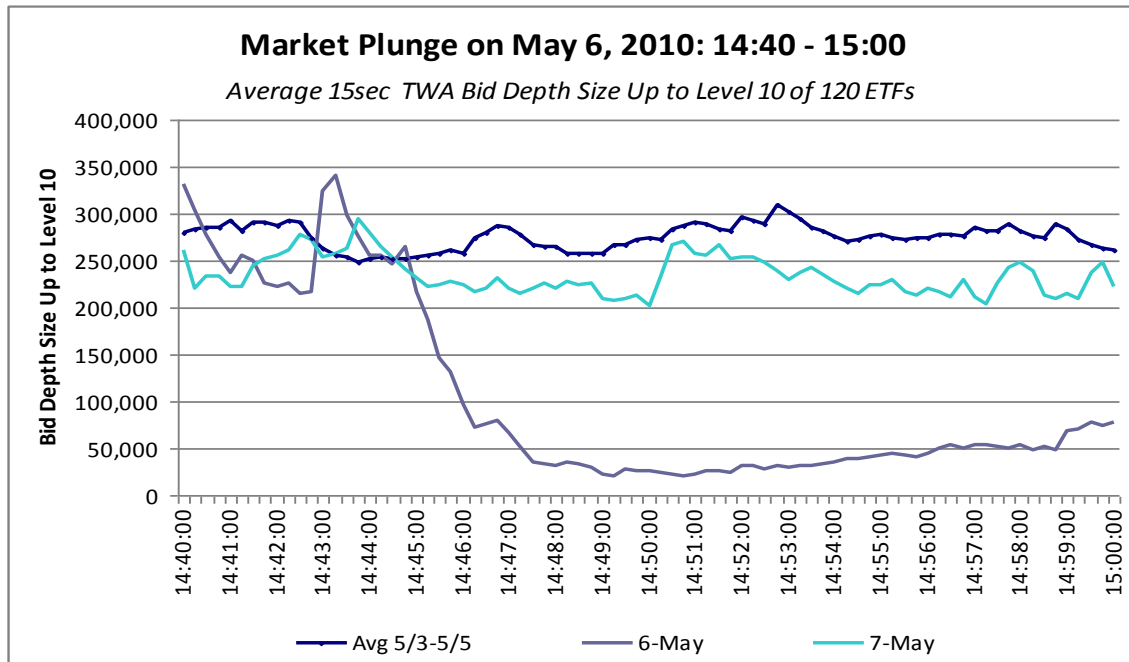
Ask depth has a very similar pattern. Ask depth declined from around 300,000 shares to a low of about 20,000 shares at 2:49:45 p.m. Ask depth also slowly moved back up over the remainder of the day to around 200,000 shares before dropping off at the close. Despite the recoveries, bid/ask depths after 3:00 p.m. on May 6<sup>th</sup> still were well below the average for the same time period on May 3<sup>rd</sup> through May 5<sup>th</sup>.

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<sup>1</sup> ETFs with lower liquidity have a disproportionate share of traded volume on Arca— 59 percent of the volume for ETFs with average daily volume of less than 100,000 shares have historically traded on Arca. Source: NYSE ARCA Vision.

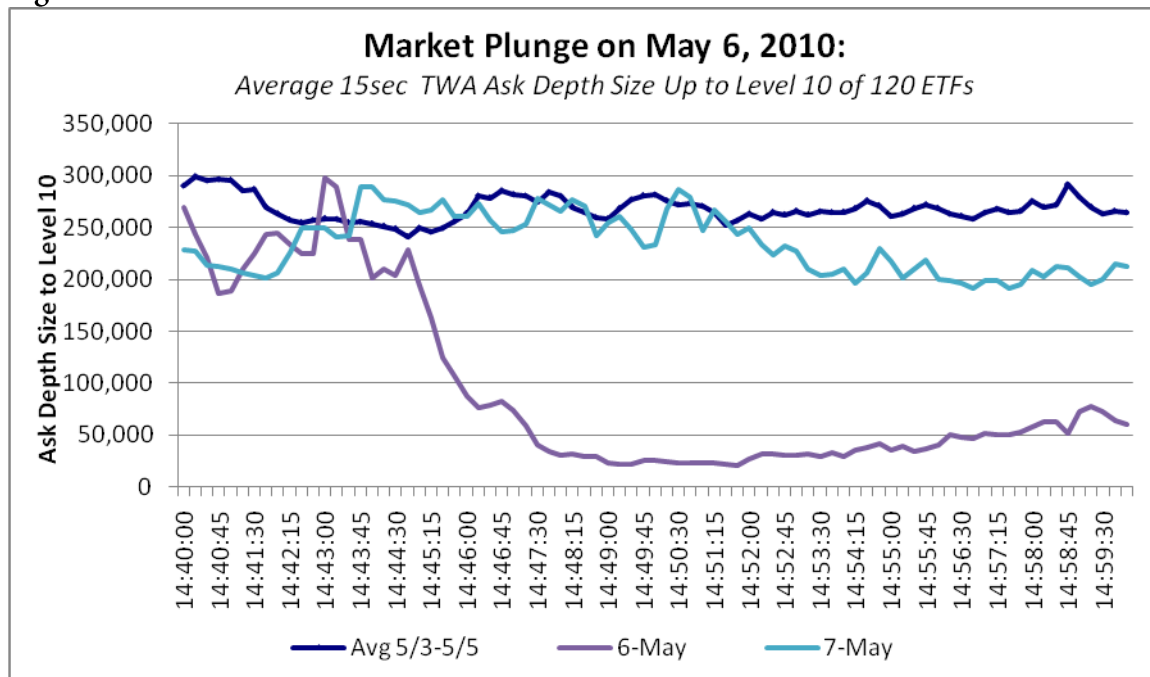
<sup>2</sup> Figures are included in Appendix A, which also shows information on time-weighted bid/ask depth for May 3<sup>rd</sup> through May 7<sup>th</sup>.

**Figure 1**



Source: Investment Technology Group

**Figure 2**

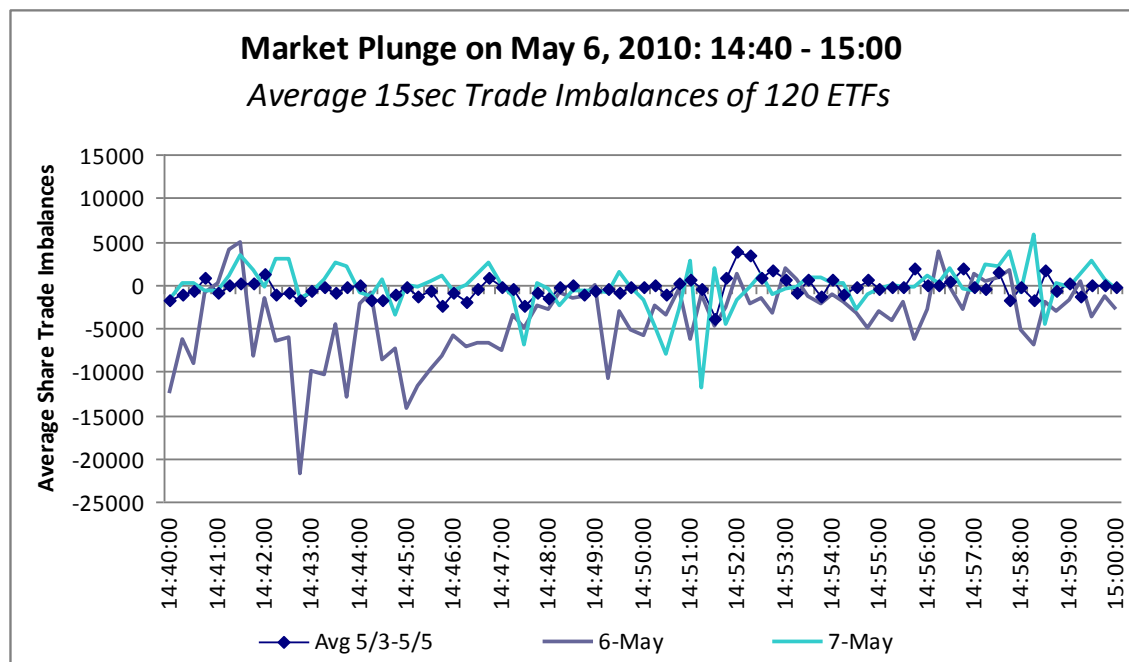


Source: Investment Technology Group



Prices of exchange-traded securities began to be negatively impacted due to the severe imbalance of sell orders to buy orders. For much of the twenty minutes between 2:40 p.m. to 3:00 p.m., the trade imbalance for these 120 ETFs, measured at 15 second intervals, was negative, indicating that sell orders exceeded buy orders (Figure 3).<sup>3</sup> The trade imbalance fell to a low of nearly negative 22,000 shares at 2:42:45 p.m.

**Figure 3**



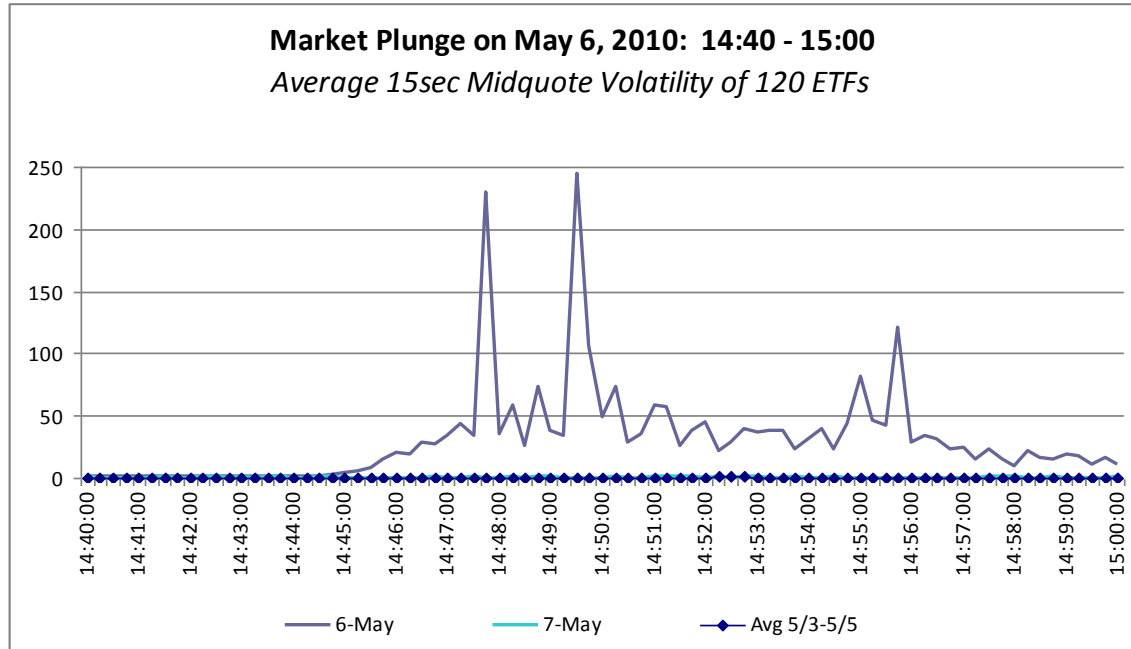
Source: Investment Technology Group

<sup>3</sup> Figure is included in Appendix B, which also shows trade imbalance information for May 3<sup>rd</sup> through May 7<sup>th</sup> and the average number of trades. The average number of trades peaked at 2:45:30 p.m. which coincides with the peak in volume for these ETFs.

***B. Increased Demand for ETFs During Volatile Times Intensified the Market Impact on ETFs***

With the prices of individual securities and ETFs declining and the securities markets executing orders in markedly different manners, the markets became increasingly volatile. Midquote (the midpoint between the bid and ask) volatility, measured at 15 second intervals for these 120 ETFs, soared between 2:45 p.m. and 3:00 p.m., reaching nearly 250 basis points at 2:49:30 p.m. (Figure 4).<sup>4</sup>

**Figure 4**



Source: Investment Technology Group

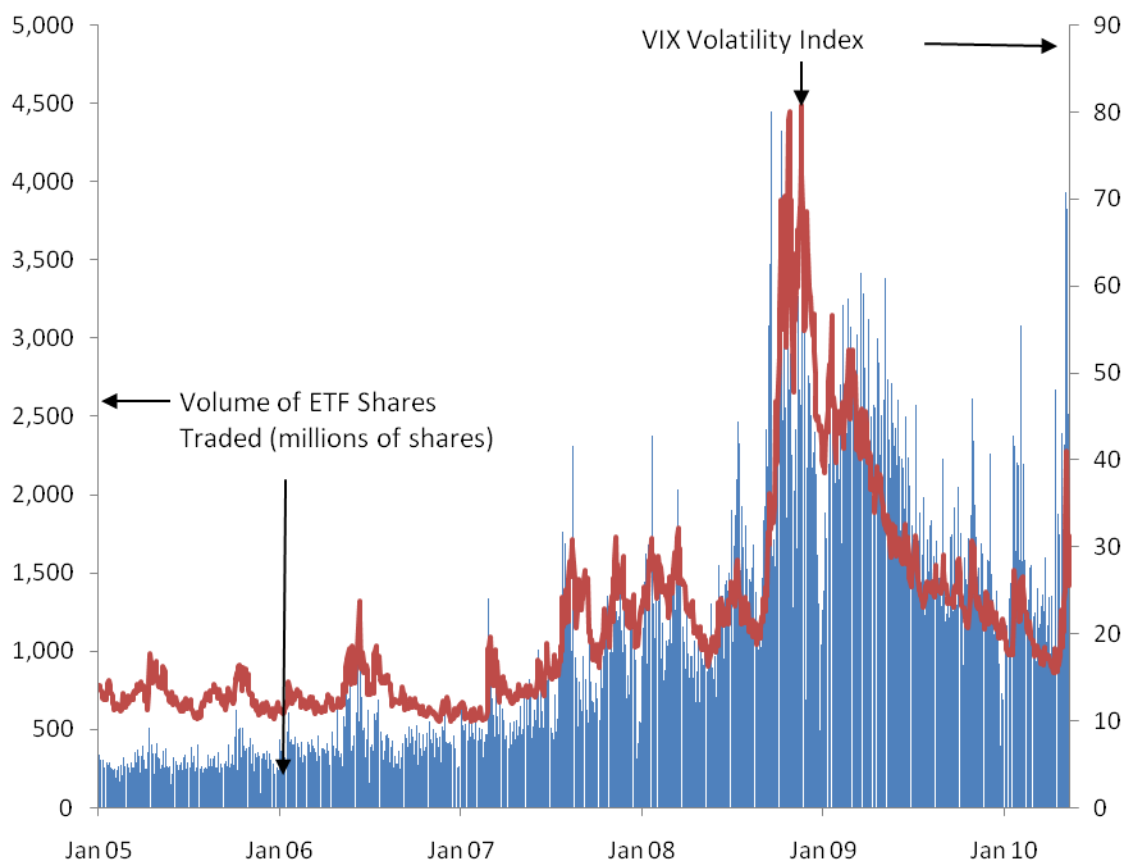
<sup>4</sup> Figure is included in Appendix C, which also shows midquote volatility information for May 3<sup>rd</sup> through May 7<sup>th</sup>.

When markets are volatile, trading volume in ETFs generally increases (Figure 5).<sup>5</sup> The daily volatility index (VIX) and aggregate ETF volume are highly positively related, with a correlation coefficient between them of 0.83 (the highest possible is 1.0).

**Figure 5**

**Daily ETF Volume and the VIX Volatility Index**

*January 3, 2005 – May 14, 2010*

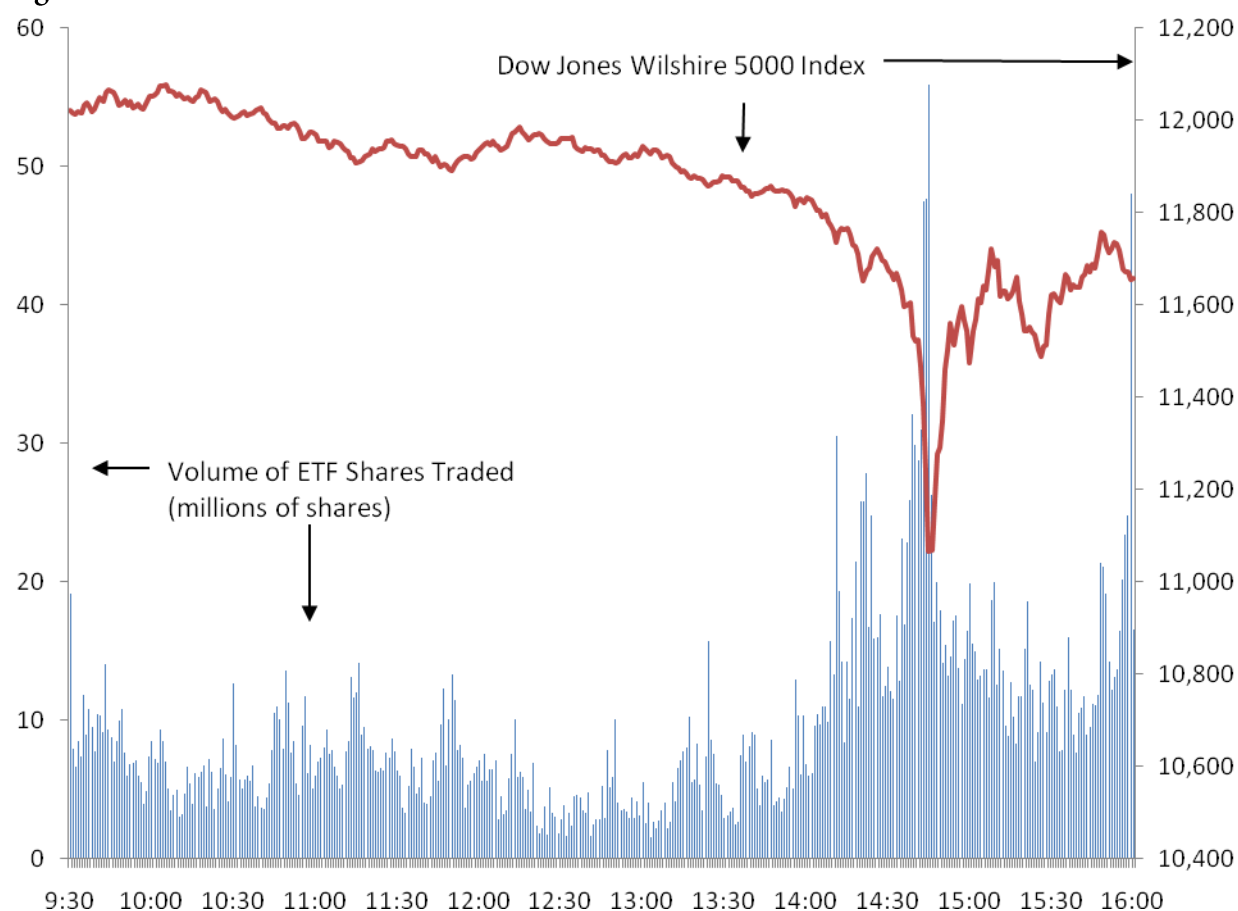


*Notes: VIX volatility index and volume of ETF shares traded shown at a business day frequency. The volume of ETF shares traded represents 842 ETFs.  
Sources: Investment Company Institute and Bloomberg*

<sup>5</sup> The VIX is the ticker symbol for the Chicago Board Options Exchange Volatility Index, a popular measure of the implied volatility of S&P 500 index options. A high value corresponds to a more volatile market. Often referred to as the “fear index,” it represents one measure of the market’s expectation of volatility over the next 30-day period.

ETFs provide an efficient way to gain exposure to a broad segment of the markets, as opposed to buying and selling all of the individual stocks comprising the basket of an ETF. They are therefore a useful tool for hedging or otherwise quickly gaining market exposure, which is particularly important in a volatile market. On May 6, as the markets began to decline significantly, investors increasingly turned to ETFs; this increased demand put pressure on their prices as liquidity declined. Aggregate ETF volume spiked when the Dow Jones Wilshire 5000 Index was declining (Figure 6).

**Figure 6**



Note: Volume of ETF shares traded and the Dow Jones Wilshire 5000 Index are shown on a one-minute frequency.

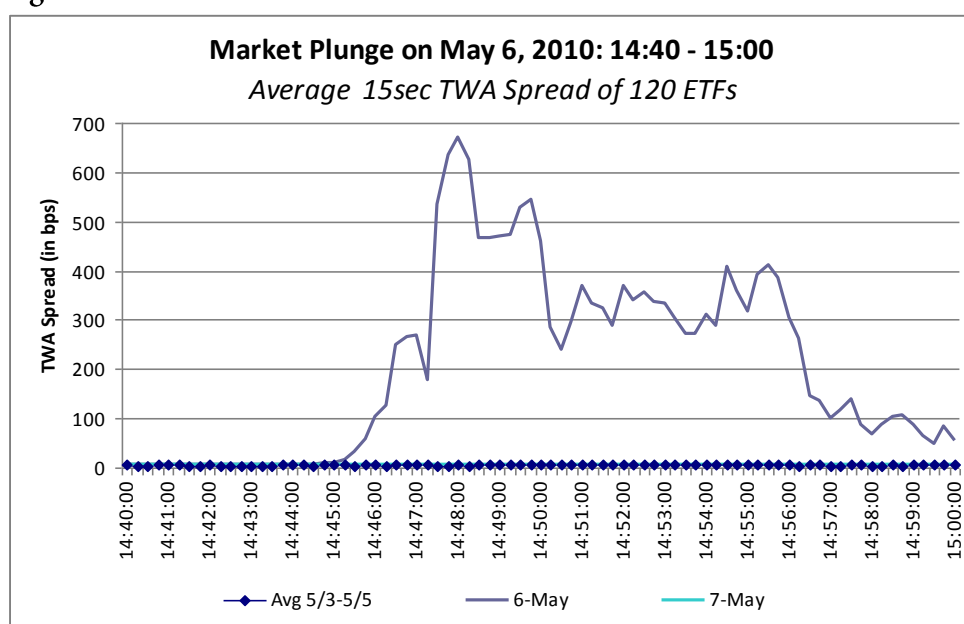
Volume of ETF shares traded represents 842 ETFs.

Sources: Investment Company Institute and Bloomberg

***C. Severe Lack of Liquidity Caused Spreads to Widen and Trades to be Executed at Untenable (“Clearly Erroneous”) Prices***

On May 6, the demand for ETF liquidity increased at a time when supply dramatically decreased. The extreme price volatility of the underlying stocks comprising the baskets of many ETFs and uncertainty over whether and when trades could be cancelled caused market makers, who normally would be making two-sided markets in ETFs, to pull out of the market, significantly decreasing the supply of liquidity for ETFs. One way that traders can “step away” away from the market is to widen the bid/ask spread. The average time-weighted spread for 120 ETFs widened enormously between 2:45 p.m. to 3:00 p.m., reaching a peak of 670 basis points at 2:48 p.m. (Figure 7).<sup>6</sup> The “normal” average spread for these ETFs is in the range of 4 to 5 basis points.

**Figure 7**



Source: Investment Technology Group

<sup>6</sup> Figure is included in Appendix D, which also shows average time-weighted spread information for May 3<sup>rd</sup> through May 7<sup>th</sup>.

In addition to market makers, other professional traders, namely high frequency traders, did not participate in the market on the buy side in many stocks that suffered extreme price declines.<sup>7</sup> At least one of our members can confirm that quotes that would normally refresh every second went several minutes without refreshing. These developments likely contributed to the disparity between the prices of ETFs and the prices of individual securities comprising the ETF basket.

As market makers stepped away the influx of orders quickly swept through available liquidity on the exchanges' order books resulting in orders, particularly market orders, breaking through many price levels in an effort to obtain an execution at any price. For 120 ETFs, hidden order (i.e., reserve order) buy and sell volume was significantly higher than normal during the twenty minute period on May 6<sup>th</sup> likely reflecting that the limit order book was being run through as reserve orders were hit at each level before executions moved down to the next level of the book (Figures 8 and 9).<sup>8</sup>

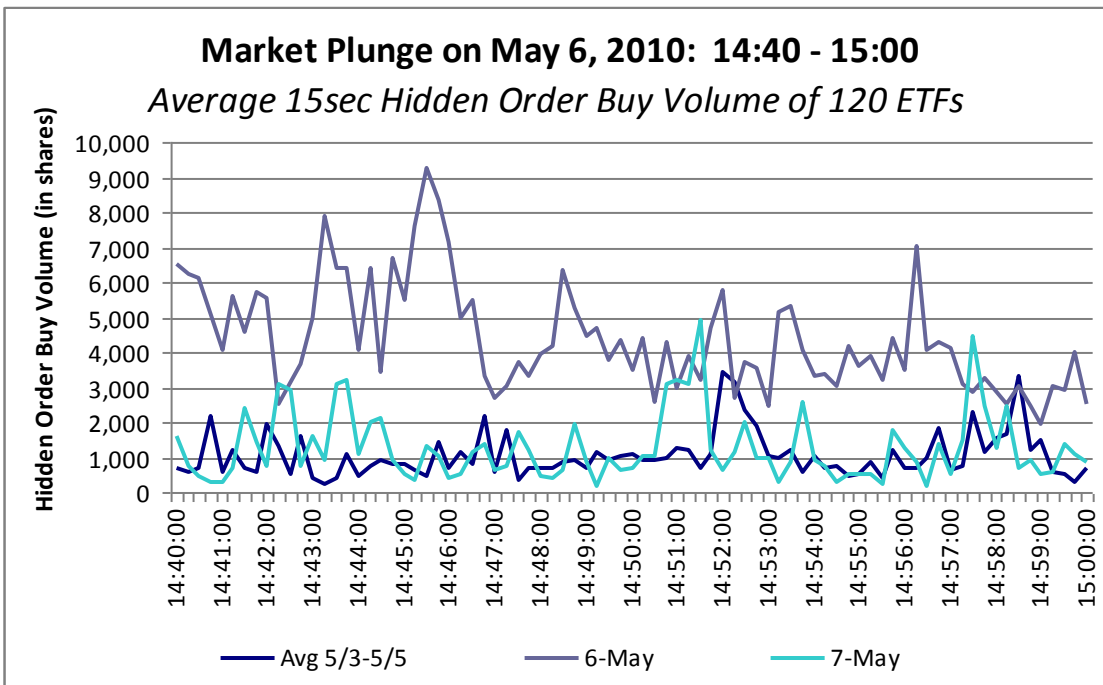
Contributing further to the execution of ETF orders at prices that were ultimately cancelled was the practice of "stub quoting." Stub quotes, which are entered by market makers as essentially place holder quotes, and can be as low as a penny, are never intended to be the prices of actual trades. Nevertheless, on May 6, many of these stub quotes were executed as the only bids left in some stocks.

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<sup>7</sup> High frequency traders function as liquidity providers in ETFs, but have no obligation or incentive to trade the securities during times of market stress.

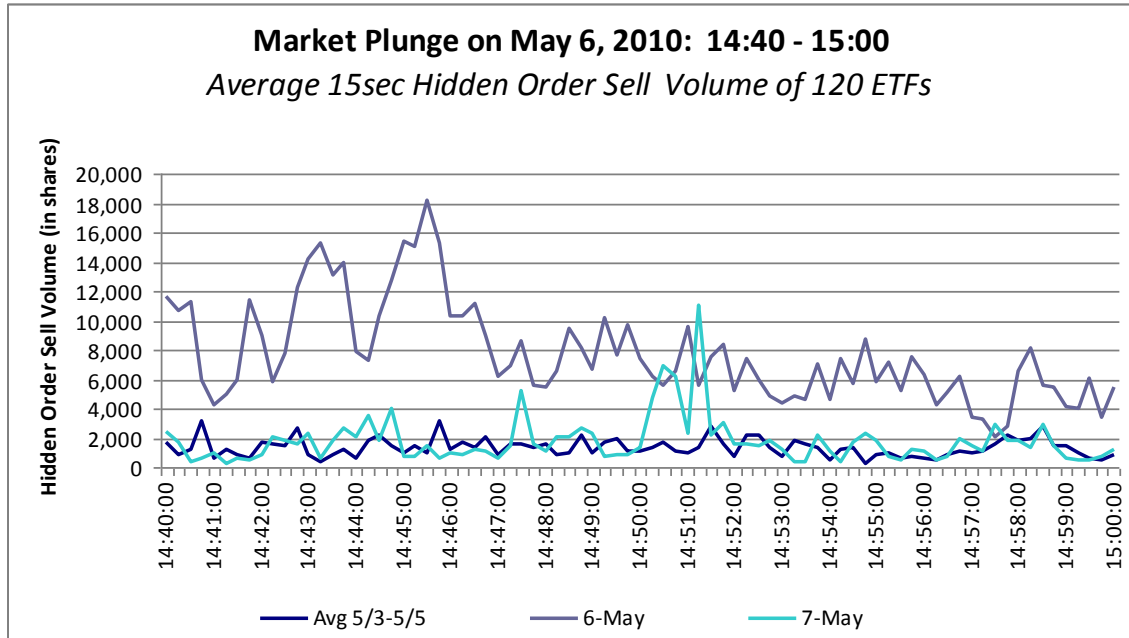
<sup>8</sup> Figures are included in Appendix E, which also shows hidden order information for May 3<sup>rd</sup> through May 7<sup>th</sup>.

Figure 8



Source: Investment Technology Group

Figure 9



Source: Investment Technology Group

As has been reported, there appear to have been a large number of stop loss orders on brokers' books without limits that turned into market orders, increasing demand for individual stocks and ETFs and exacerbating price declines. Anecdotal evidence from a few retail-oriented brokerages indicates that this was the case. One large broker found that 60 percent of its broken ETF trades were stop loss orders, 36 percent were market orders, and 4 percent were limit orders. Data from two other brokers show that even higher percentages of broken ETF trades were stop loss orders: 86 percent and 70 percent, respectively.

### **III. Precipitous Drop in Individual Stock Prices Caused Subsequent Drop in ETF Prices**

ETFs are generally comprised of a basket of individual stocks. Naturally, due to the nature of the composition of ETFs, a significant and abrupt move in the price of an individual stock will impact the price of an ETF. When the markets are functioning normally, ETFs adjust well to significant changes in prices of individual stocks.

During the trading events of May 6, we believe that as individual stocks suffered significant declines in their prices, the prices of ETFs with those stocks in their baskets experienced declines similar to the individual securities. As the prices of individual stocks declined, computers monitoring the share prices of ETFs and comparing them to the fair value of their underlying components began to try to arbitrage the difference away, *e.g.*, selling an ETF and attempting to buy its underlying securities, as is the natural arbitrage mechanism of an ETF. During the afternoon of May 6, however, as the prices of individual securities dropped precipitously, ETFs appeared overvalued, causing computers to sell, which in turn drove prices even lower as automated systems routed market orders that overwhelmed the markets.

### **IV. Impact of Movements in Futures Markets**

Many trading systems benchmark ETFs against the S&P 500 "e-mini" futures contract. These systems monitor the futures contract as a proxy for market movements, and watch for a divergence between futures and ETFs. If, as has been reported, there was a significant trade in the futures contract, trading algorithms may have determined that it should sell ETFs.

### **V. Impact on Events in International Arena**

The events in Greece and the economic uncertainty throughout Europe must be examined to determine whether they exacerbated the market drop on May 6<sup>th</sup>. With memories fresh from the fall 2008, traders struggling to understand the precipitous decline in the U.S. market may well have feared that a wide-spread financial collapse in Europe had triggered the decline. Against the well-publicized backdrop of a standoff between police and Greek citizens, and uncertainty whether the European Union would act to stabilize the region's finances, fear may well have contributed to the events of May 6.



## **VI. Additional Data**

In addition to the data discussed above, we also have information on cancellations/modifications to displayed limit orders and short sales for a large sample of ETFs with broken trades. For 120 ETFs, the average number of cancellations and modifications of both buy and sell limit orders were abnormally high during the period 2:40 p.m. to 3:00 p.m. on May 6<sup>th</sup> (Figures 10 and 11).<sup>9</sup>

The average daily short sales ratio for 219 ETFs with broken trades does not appear to be excessively high when compared with a recent history back to August 2009 (Figure 12). On May 6<sup>th</sup>, the average short sales ratio for these ETFs was 45 percent compared with an average of 41 percent from August 2009 through April 2010 (Figure 13). Nevertheless, the short sale ratio for any given ETF can be quite volatile from day-to-day. Only 4 ETFs had a short sales ratio on May 6<sup>th</sup> that was more than two standard deviations above its average (Figure 14). Twenty-nine ETFs had a short sales ratio on May 6<sup>th</sup> that was within 1 to 2 standard deviations above its average.

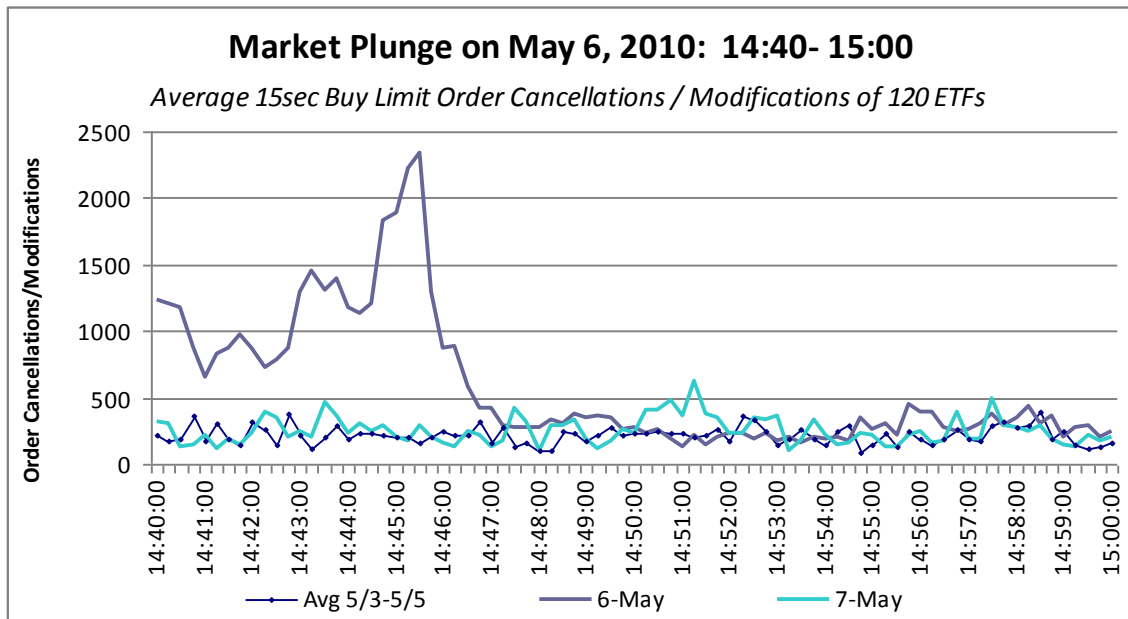
## **VII. Conclusion**

The large and sudden price dislocations experienced on May 6 were the result of market structure flaws that affected ETFs more – but not differently – than individual securities. Changes to our market structure to allow pauses on an individual stock basis that would allow supply and demand to meet each other, and clarity around order cancellations, should largely address the trading disruptions experienced by ETFs and individual securities on May 6.

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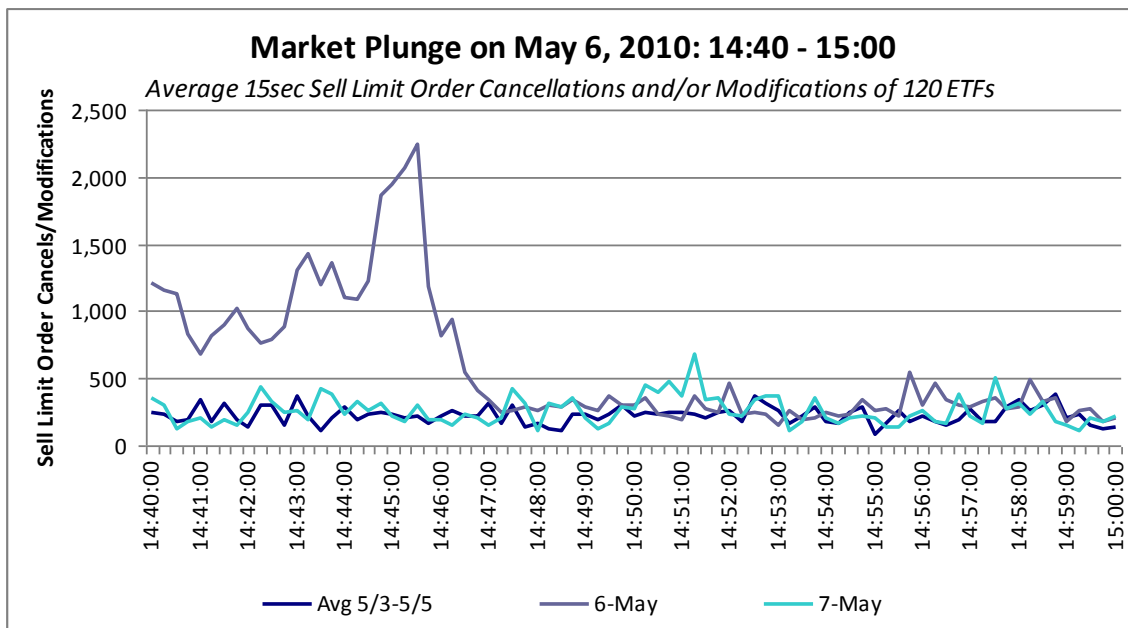
<sup>9</sup> Figures are included in Appendix F, which also shows cancellation/modification information for May 3<sup>rd</sup> through May 7<sup>th</sup>. On May 6<sup>th</sup> cancellations of limit orders started moving up around 2 p.m.

Figure 10



Source: Investment Technology Group

Figure 11

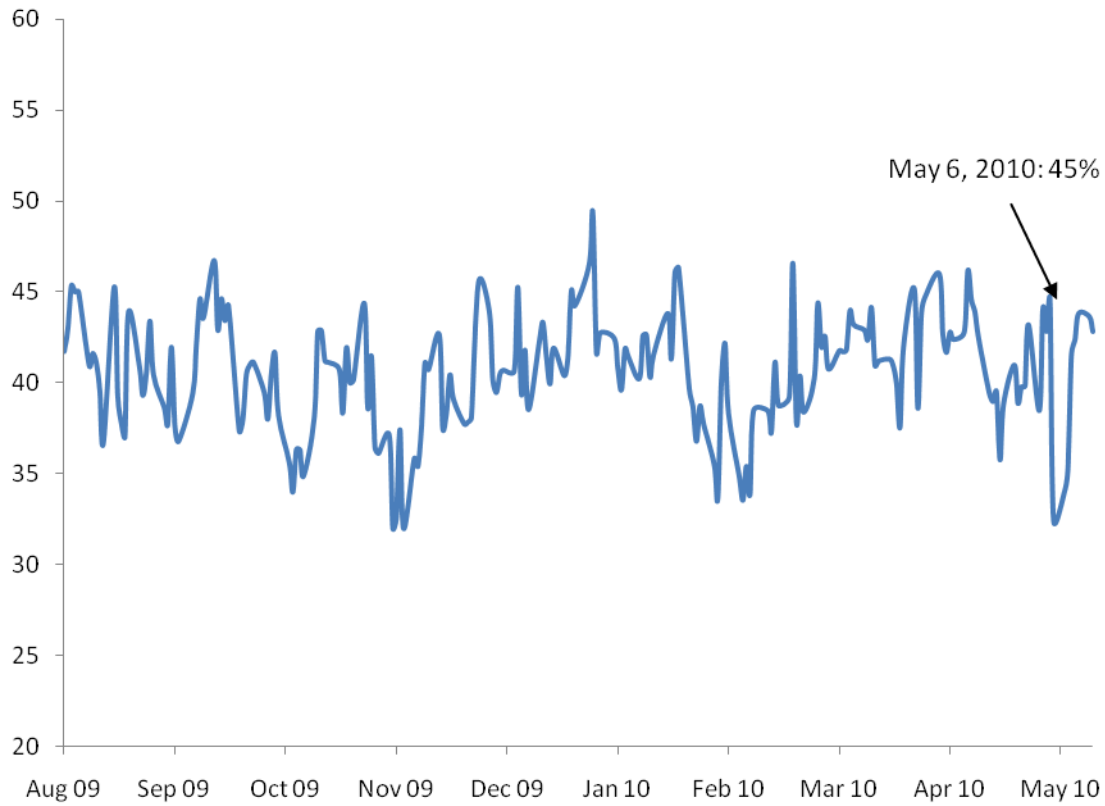


Source: Investment Technology Group

**Figure 12**

**Average Daily Short Sales Ratios for 219 ETFs with Broken Trades\***

*Percent, August 3, 2010 - May 18, 2010*



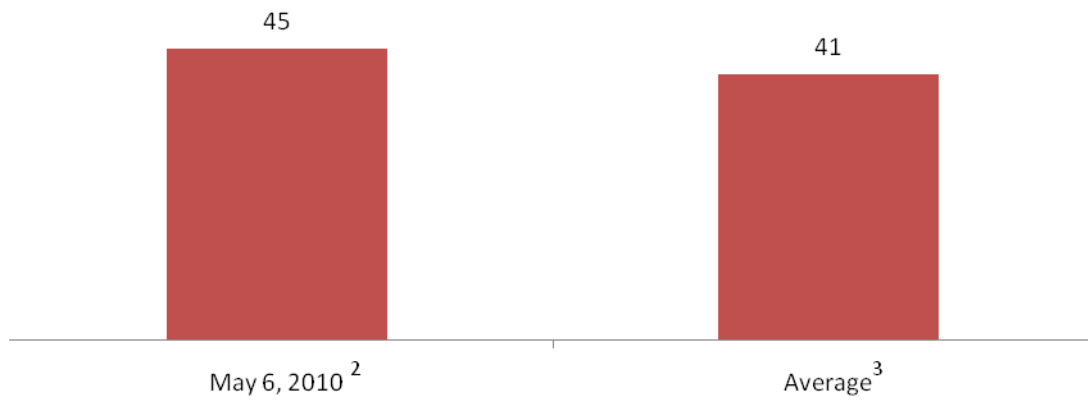
*\*Note: The short sales ratio is calculated as the volume of short selling divided by total volume. Calculations reflect volume on NYSE Arca only. The average is calculated as the simple average of the short sales ratios for 219 ETFs that had broken trades on May 6, 2010.*

*Sources: Investment Company Institute and NYSE Arca.*

**Figure 13**

**Average Short Sales Ratios for 219 ETFs with Broken Trades<sup>1</sup>**

Percent



<sup>1</sup>The short sales ratio is calculated as the volume of short selling divided by total volume. Calculations reflect volume on NYSE Arca only.

<sup>2</sup>The short sales ratio on May 6, 2010 is calculated as the simple average of the short sales ratios for 219 ETFs with broken trades on the day.

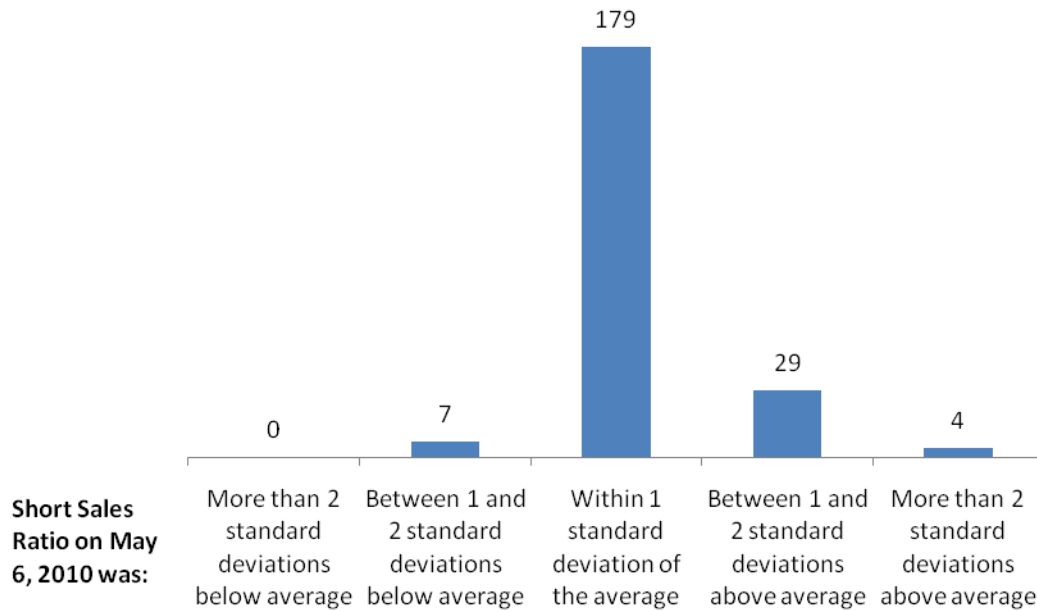
<sup>3</sup>"Average" represents the simple average of the average daily short sales ratios for 219 ETFs from August 2009 through April 2010.

Sources: Investment Company Institute and NYSE Arca.

**Figure 14**

**Distribution of 219 ETFs by Deviation From Their Average Short Sales Ratio\***

*Number of ETFs*



*\*Note: The short sales ratio is calculated as the volume of short selling divided by total volume. Calculations reflect volume on NYSE Arca only. Sample includes 219 ETFs with with broken trades on May 6, 2010. Averages and standard deviations were calculated for each individual ETF over the period August 2009 - April 2010.*

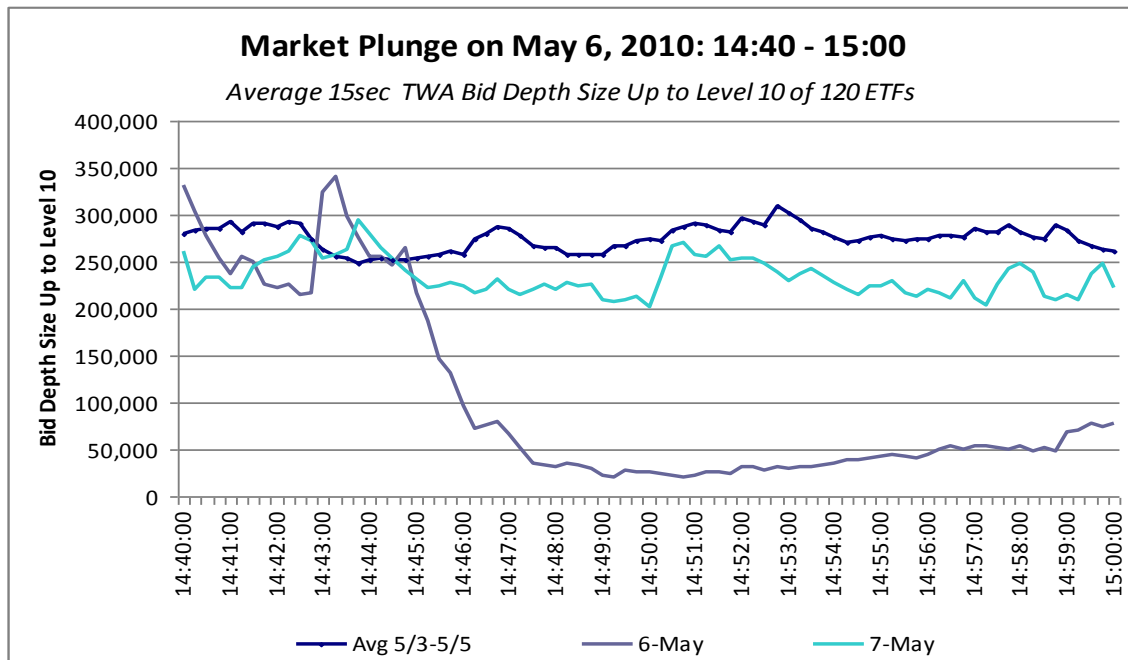
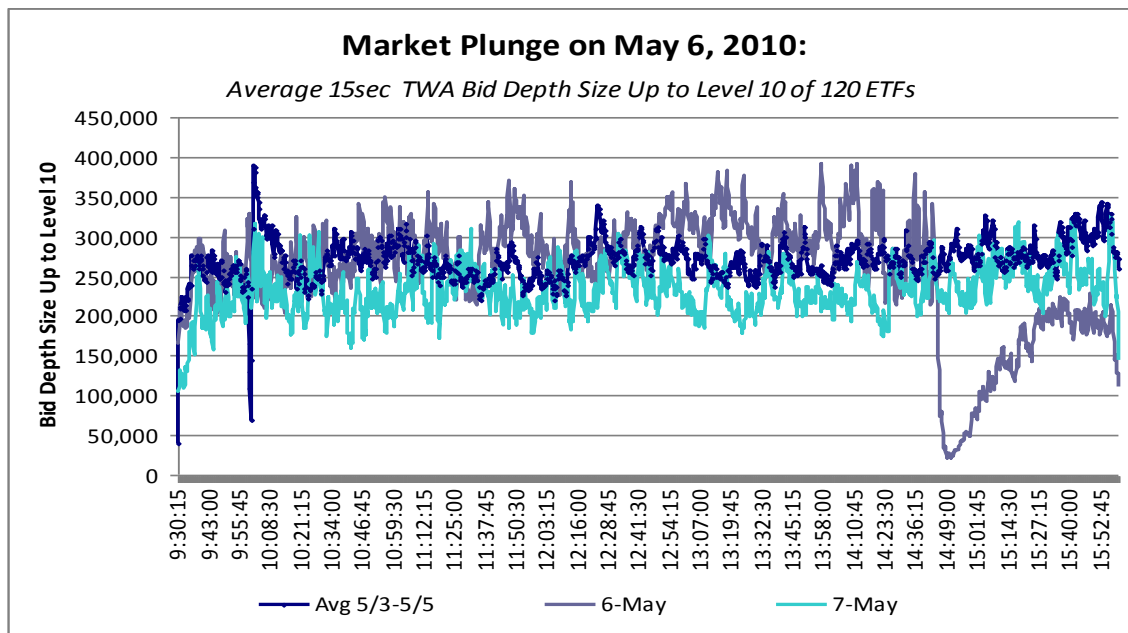
*Sources: Investment Company Institute and NYSE Arca .*

## Appendix A: Average Bid and Ask Depth Sizes

The charts in this appendix show average bid and ask depth sizes for 120 ETFs tracked by ITG. These sizes represent displayed limit orders on the first 10 levels of the limit order book, and were calculated using Level II data from the following exchanges: BATS, NYSE, NYSE Arca, and NASDAQ.

### Average 15 Second TWA Bid Depth Size up to Level 10

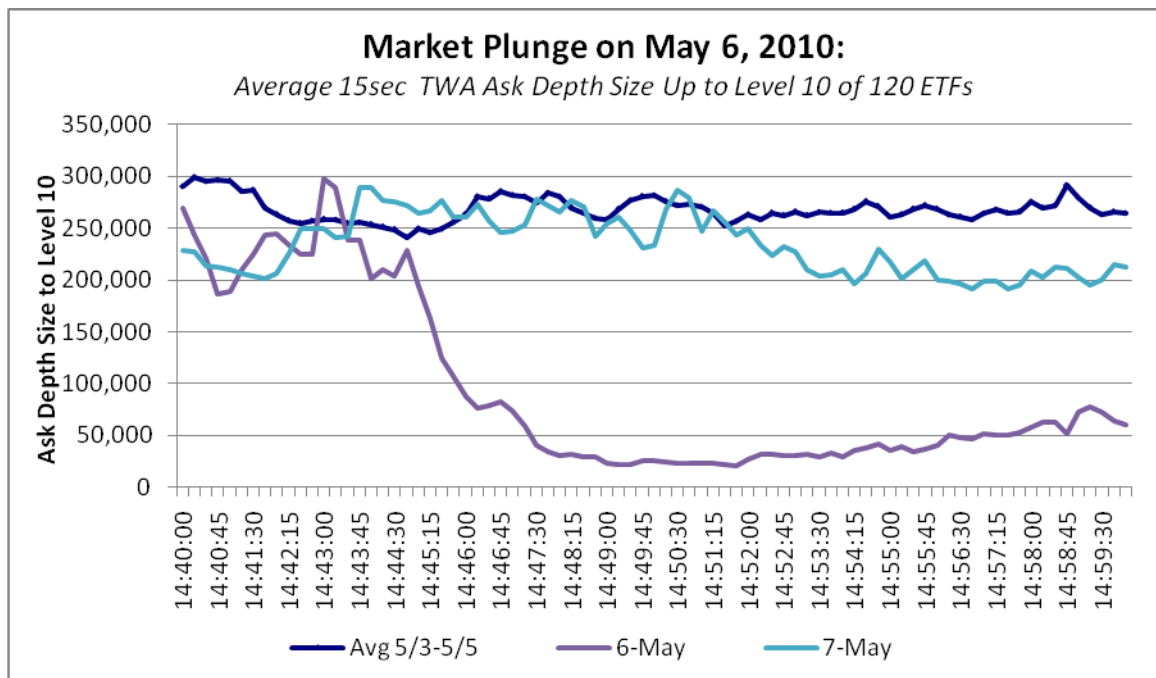
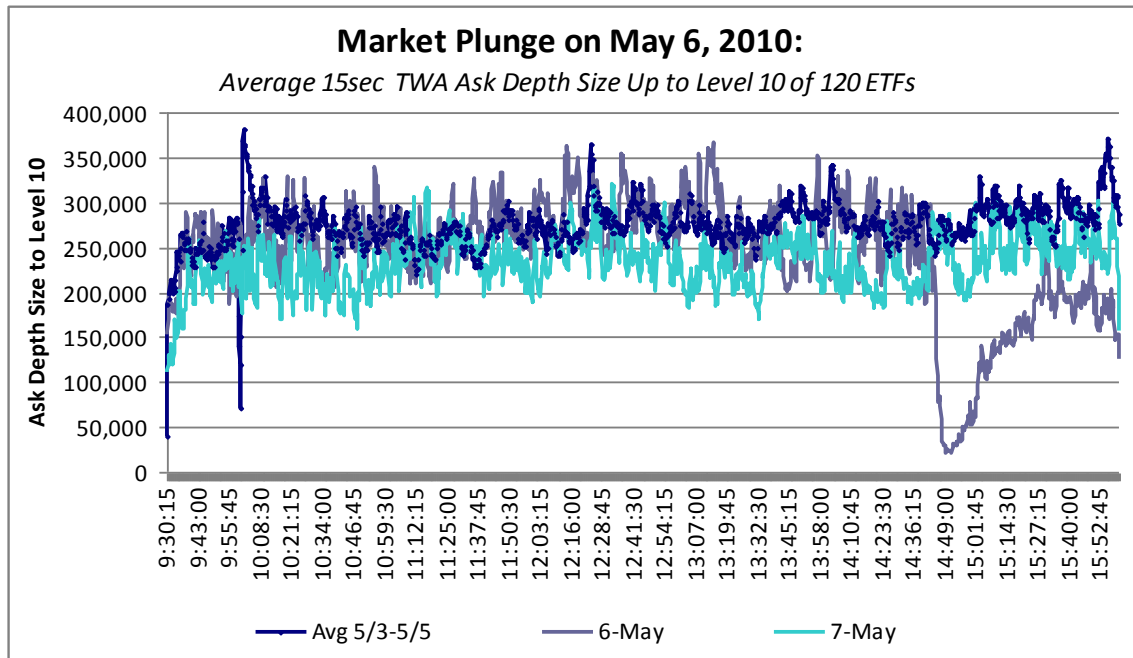
The following two charts show the time weighted average (TWA) bid depth size up to level 10. The lines represent the TWA bid depth size up to level 10 from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00 on May 6.



Source: Investment Technology Group

### Average 15 Second TWA Ask Depth Size up to Level 10

The following two charts show the average time weighted average (TWA) ask depth size up to level 10 for 120 ETFs tracked by ITG. The lines represent the TWA ask depth size up to level 10 from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00 on May 6.

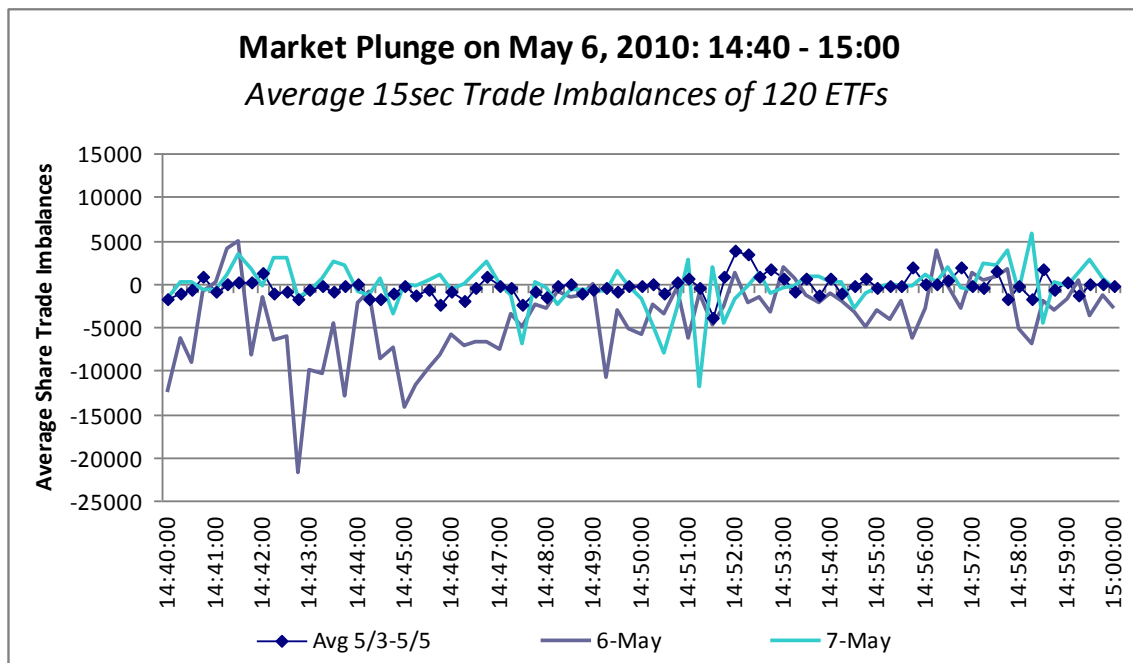
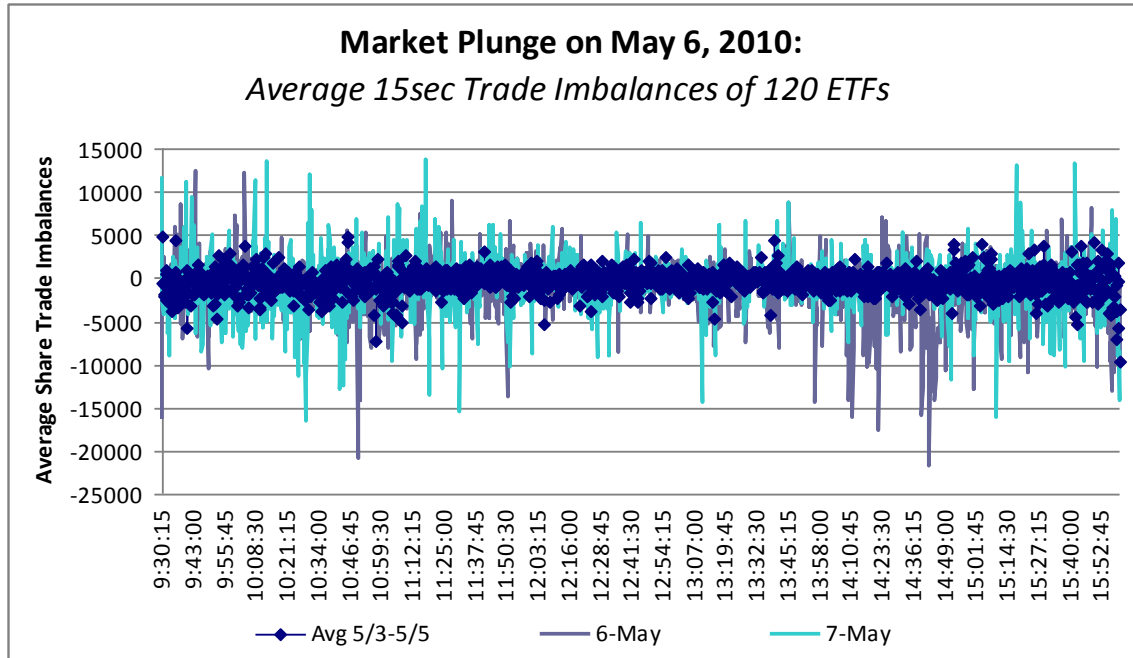


Source: Investment Technology Group

## Appendix B: Trade Imbalances and Number of Trades

### Average 15 Second Trade Imbalances

The following two charts show the average trade imbalances (buys minus sells) for 120 ETFs tracked by ITG. The lines represent the average trade imbalances from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.

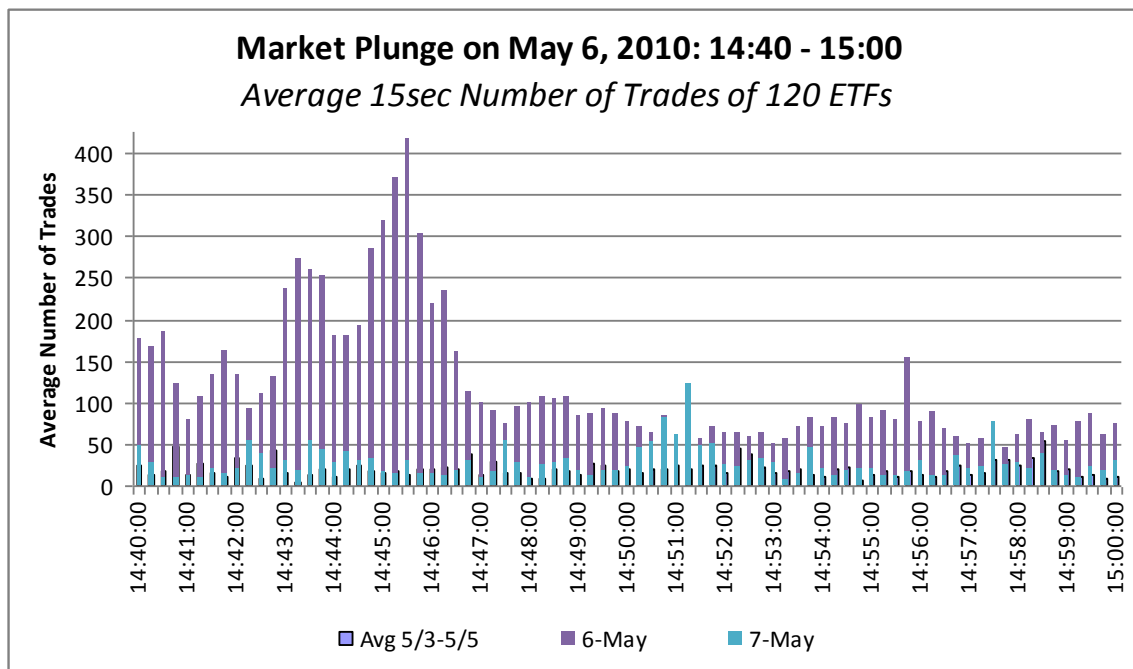
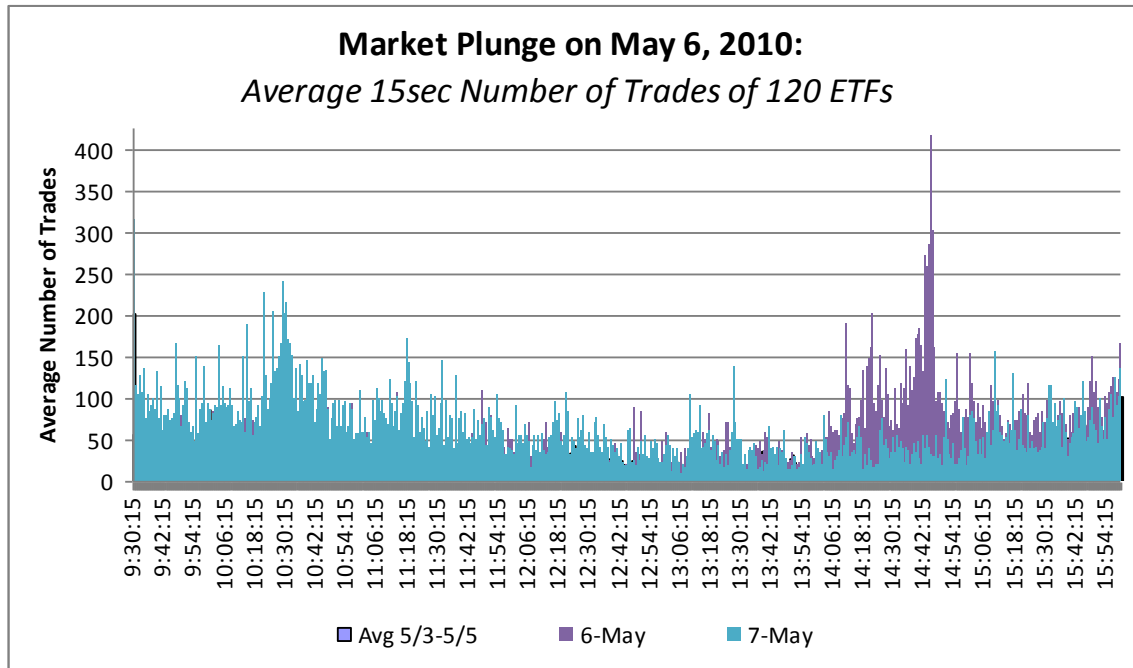


Source: Investment Technology Group



### Average 15 Second Number of Trades

The following two charts show the average number of trades for 120 ETFs tracked by ITG. The lines represent the average number of trades from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.

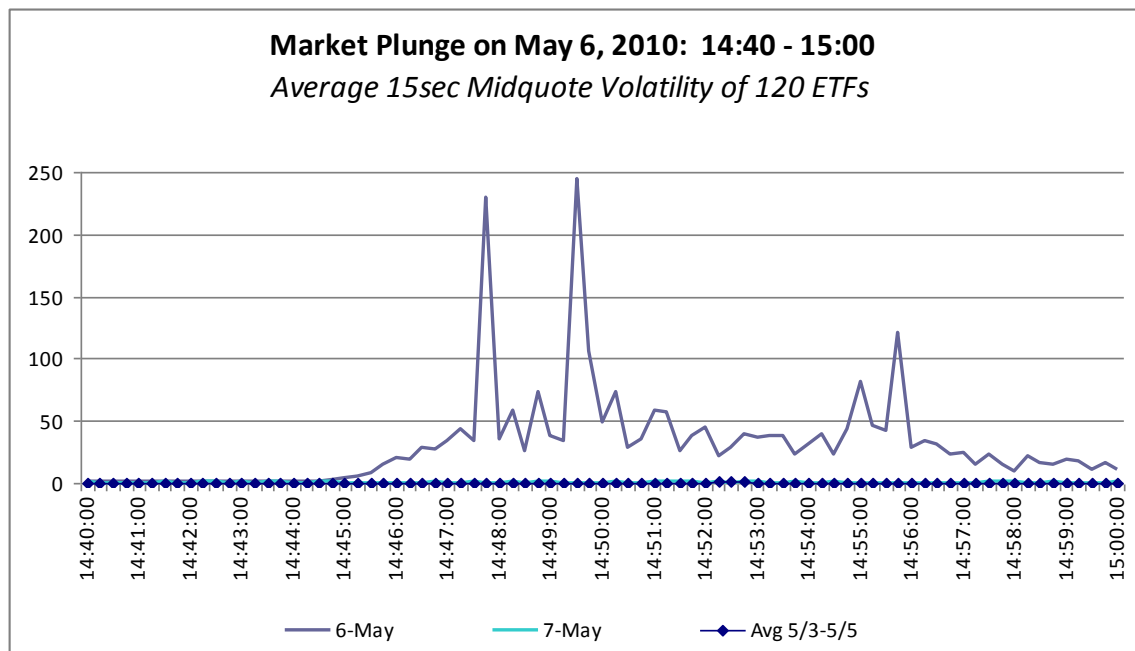
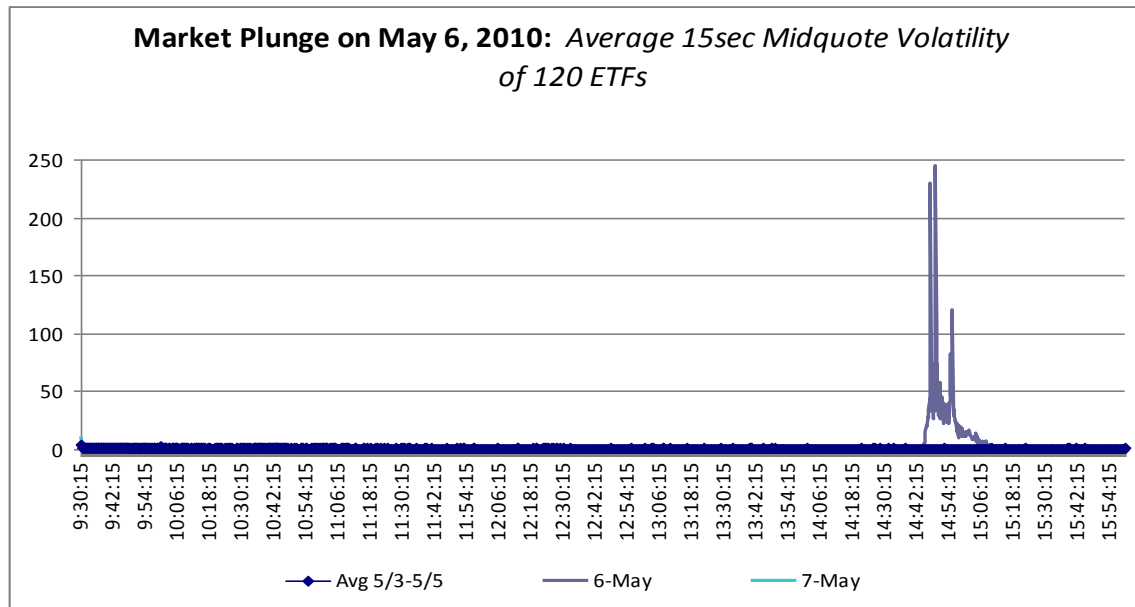


Source: Investment Technology Group

## Appendix C: Midquote Volatility

### Average 15 Second Midquote Volatility

The following two charts show the average midquote volatility for 120 ETFs tracked by ITG. The lines represent the average midquote volatility from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.

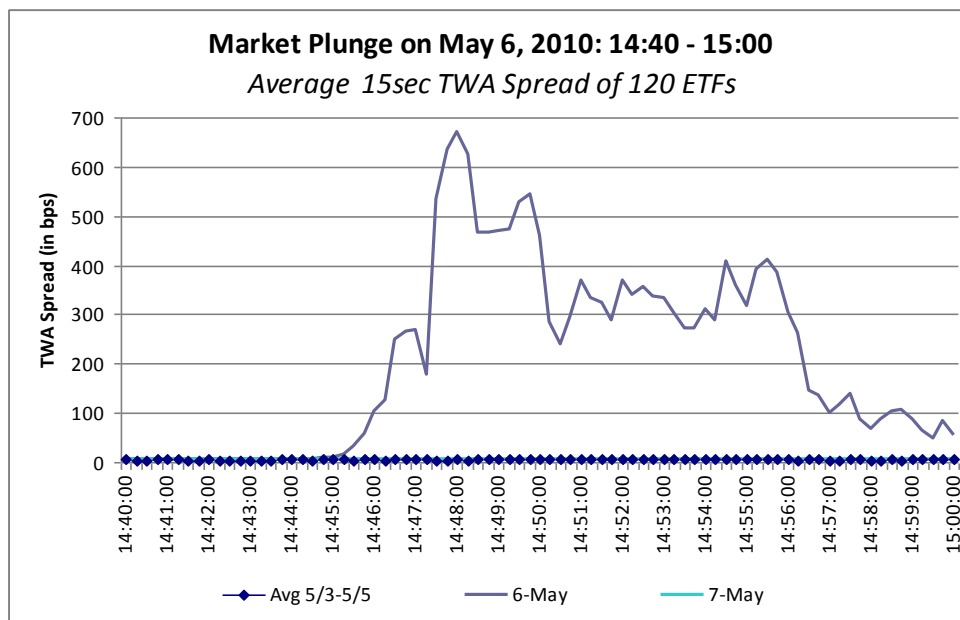
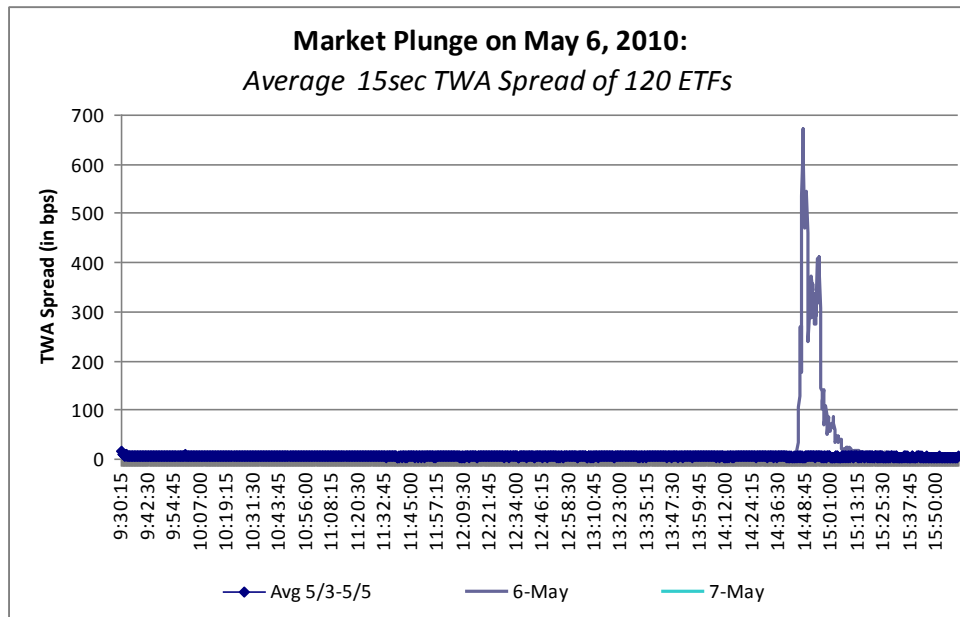


Source: Investment Technology Group

## Appendix D: Average Bid-Ask Spreads

### Average 15 Second Time Weighted Spreads

The following two charts show the time weighted bid-ask spreads for 120 ETFs tracked by ITG. The lines represent the average spread from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.

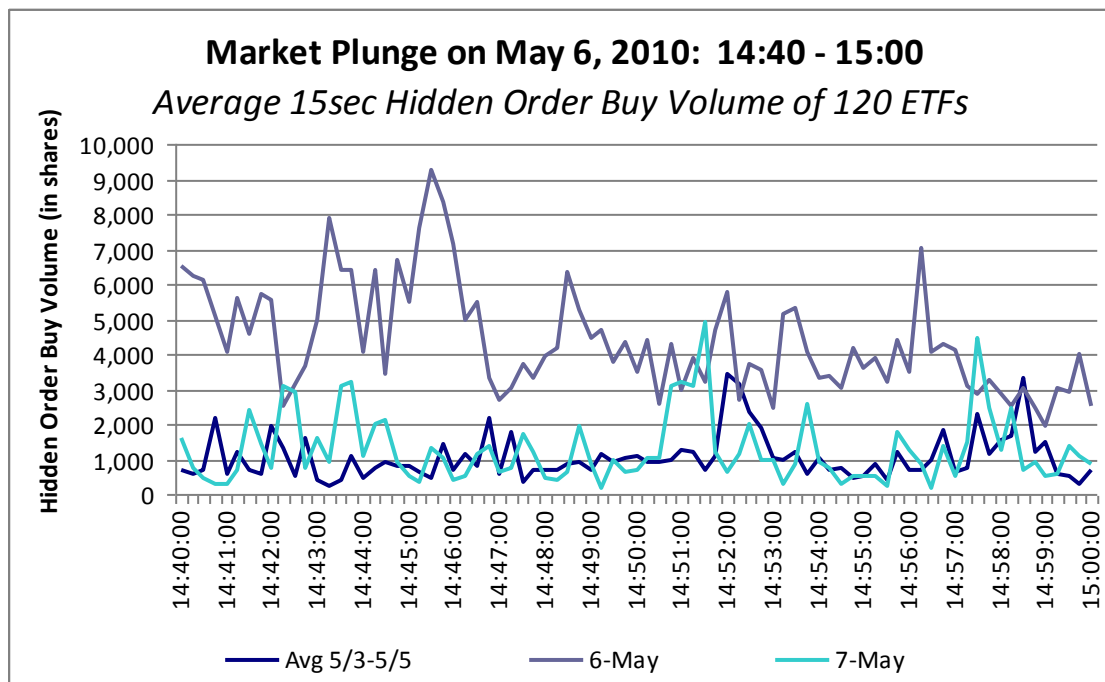
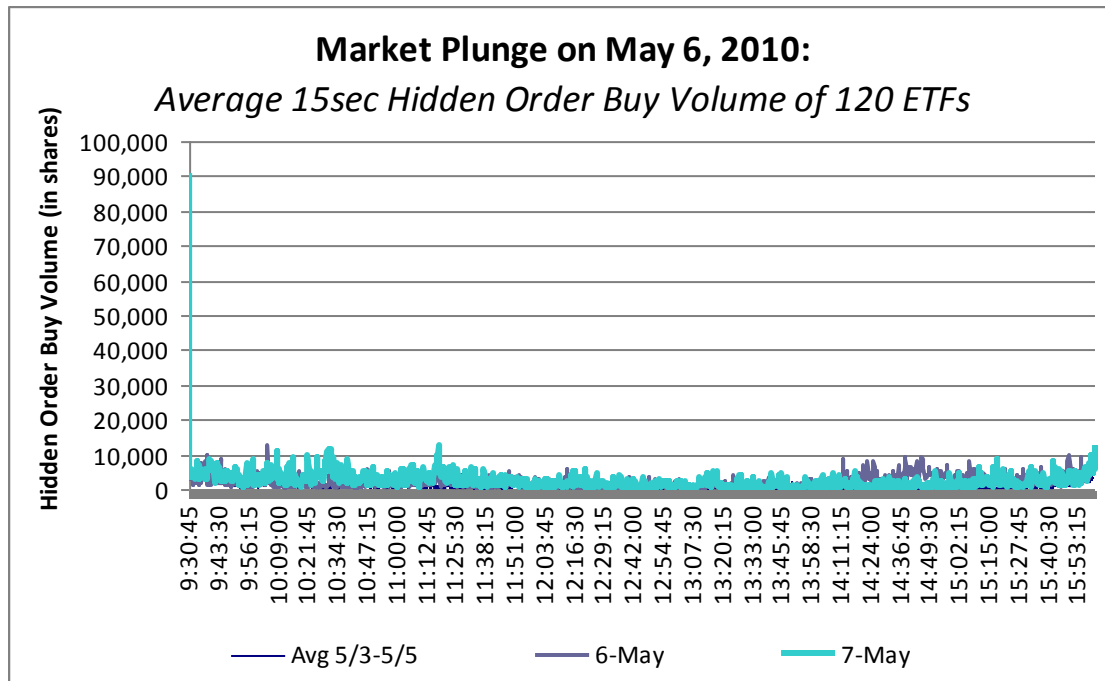


Source: Investment Technology Group

## Appendix E: Hidden Order Volume

### Average 15 Second Hidden Order Buy Volume

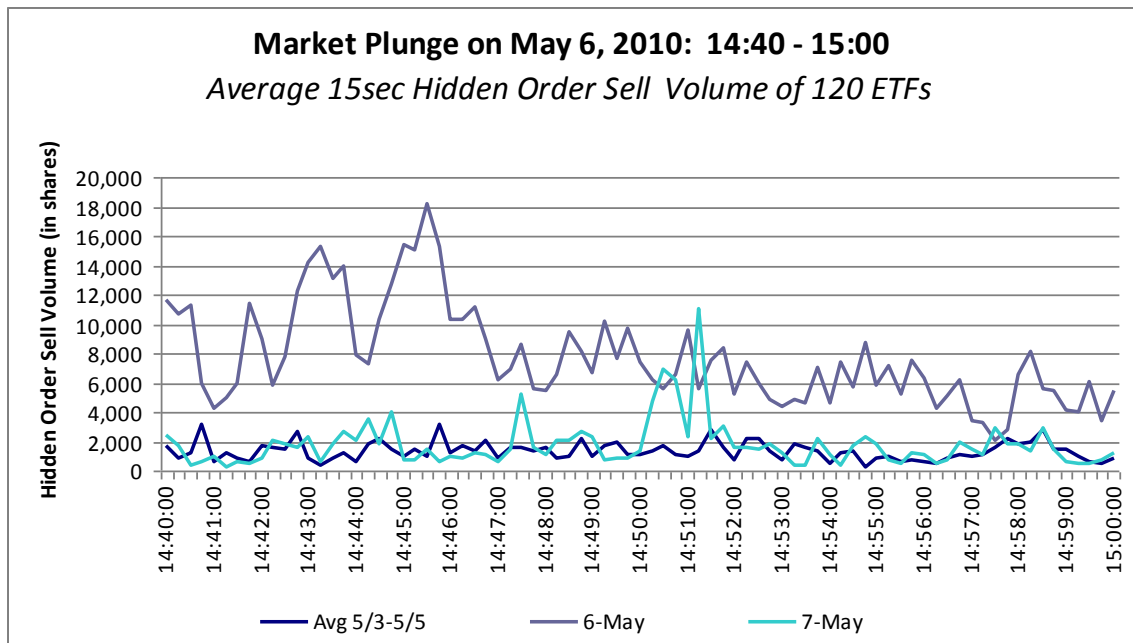
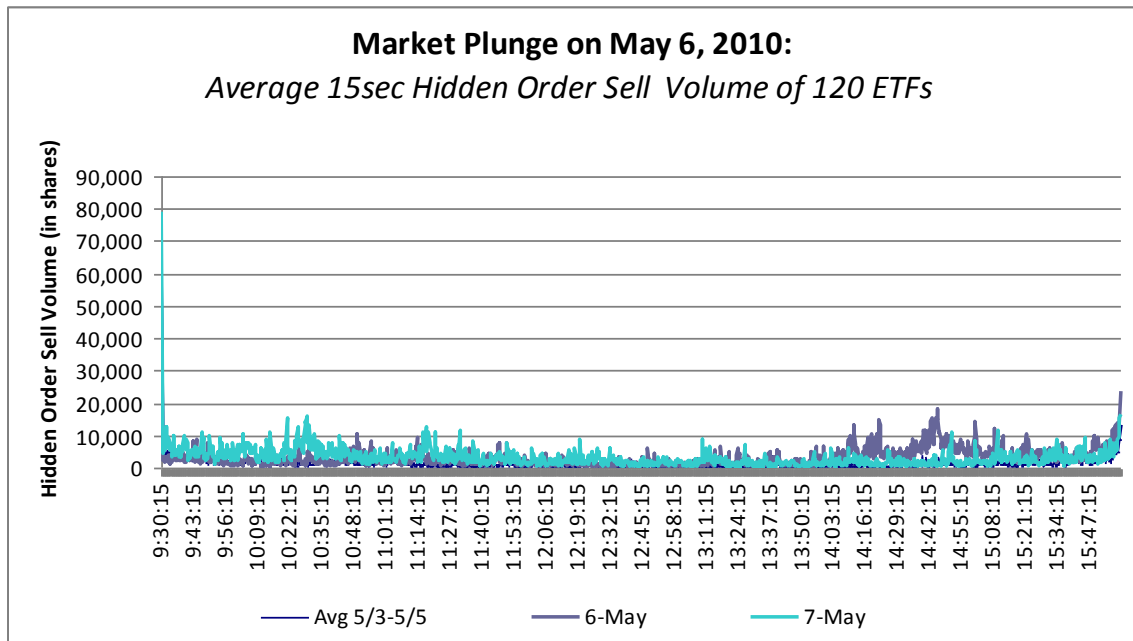
The following two charts show the average hidden order buy volume for 120 ETFs tracked by ITG. The lines represent the average hidden order buy volume from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.



Source: Investment Technology Group

### Average 15 Second Hidden Order Sell Volume

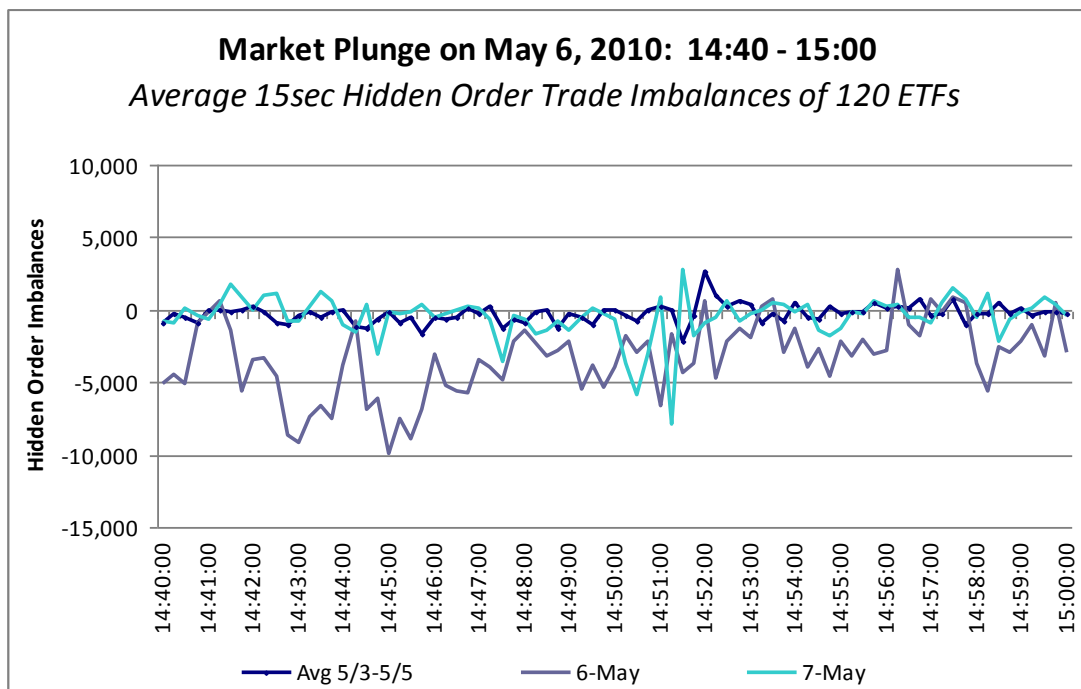
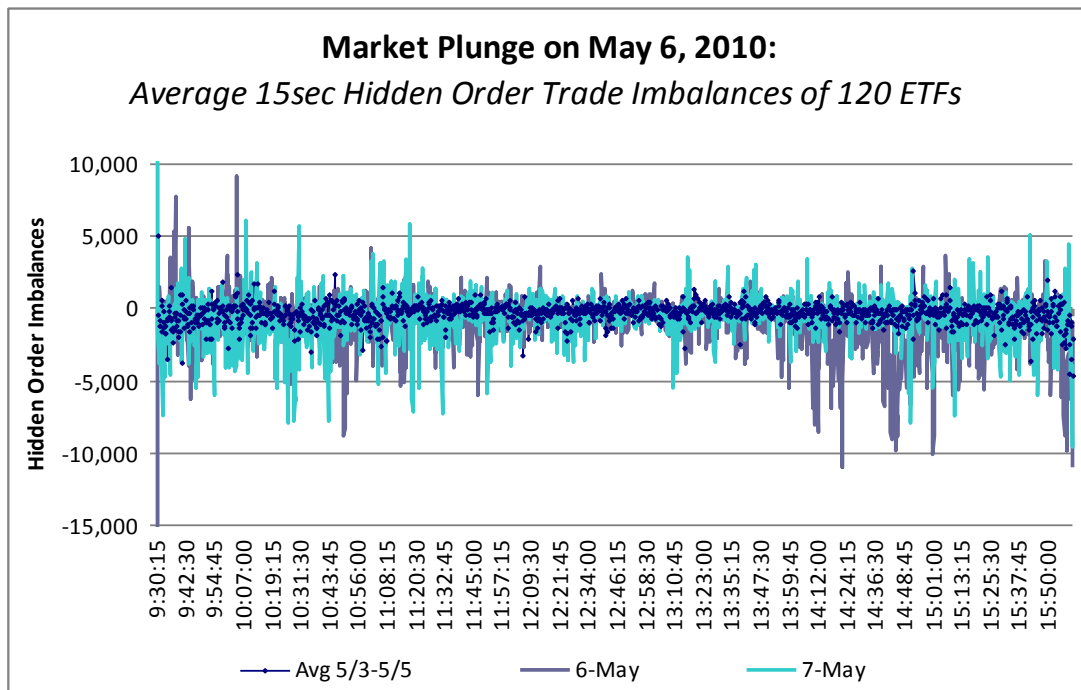
The following two charts show the average hidden order sell volume for 120 ETFs tracked by ITG. The lines represent the average hidden order sell volume from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.



Source: Investment Technology Group

### Average 15 Second Hidden Order Trade Imbalances

The following two charts show the average hidden order trade imbalances for 120 ETFs tracked by ITG. The lines represent the average hidden order trade imbalances from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.

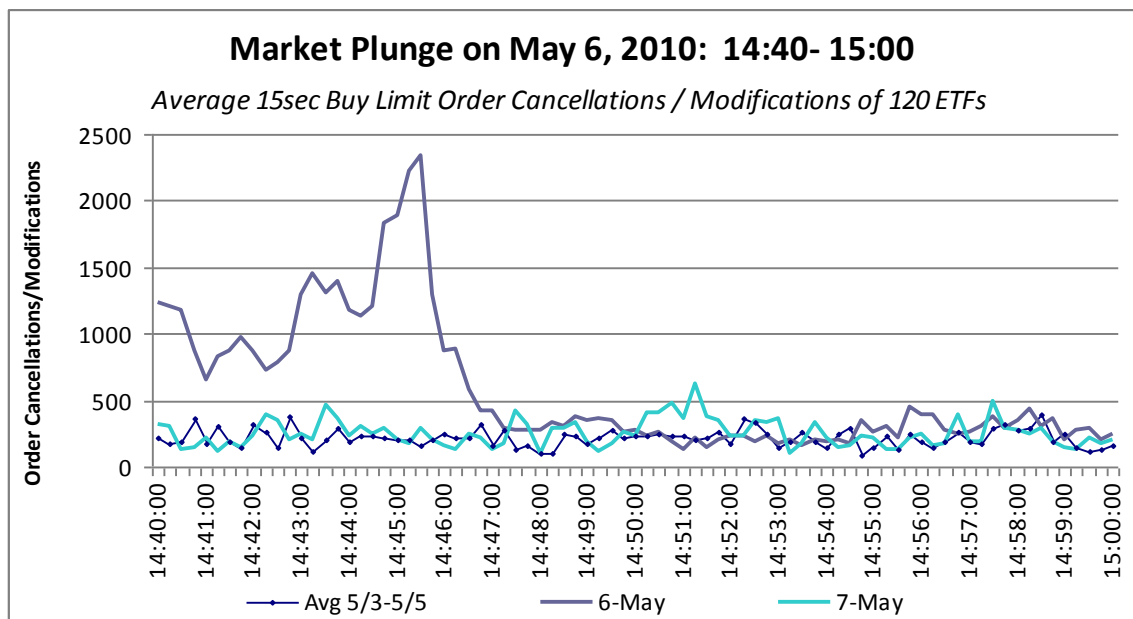
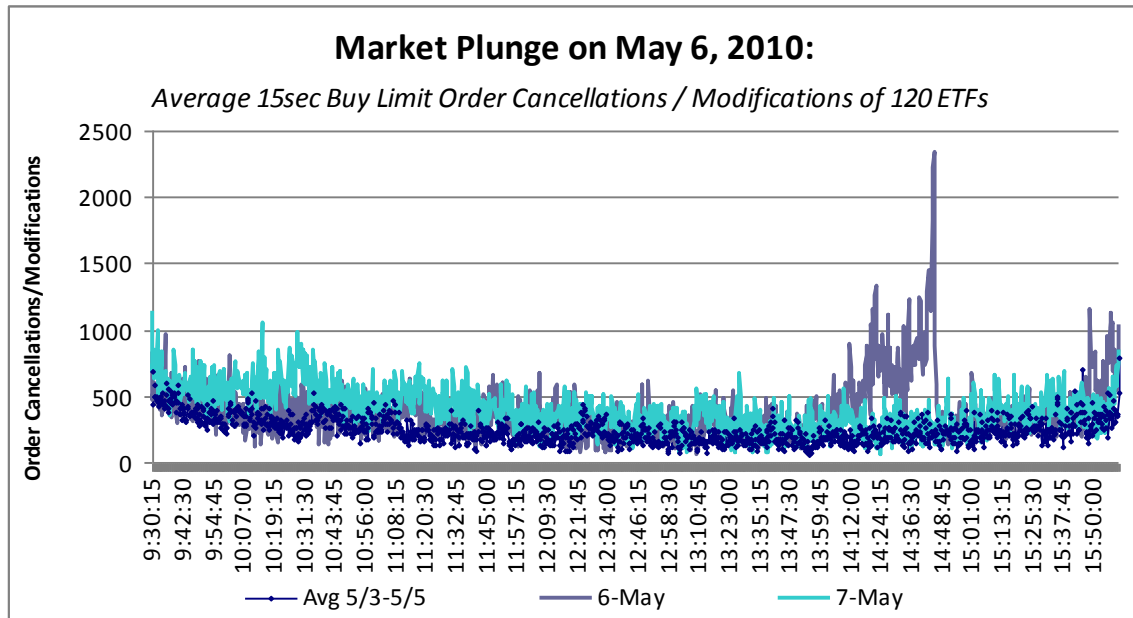


Source: Investment Technology Group

## Appendix F: Limit Order Cancellations and Modifications

### Average 15 Second Buy Limit Order Cancellations/Modifications

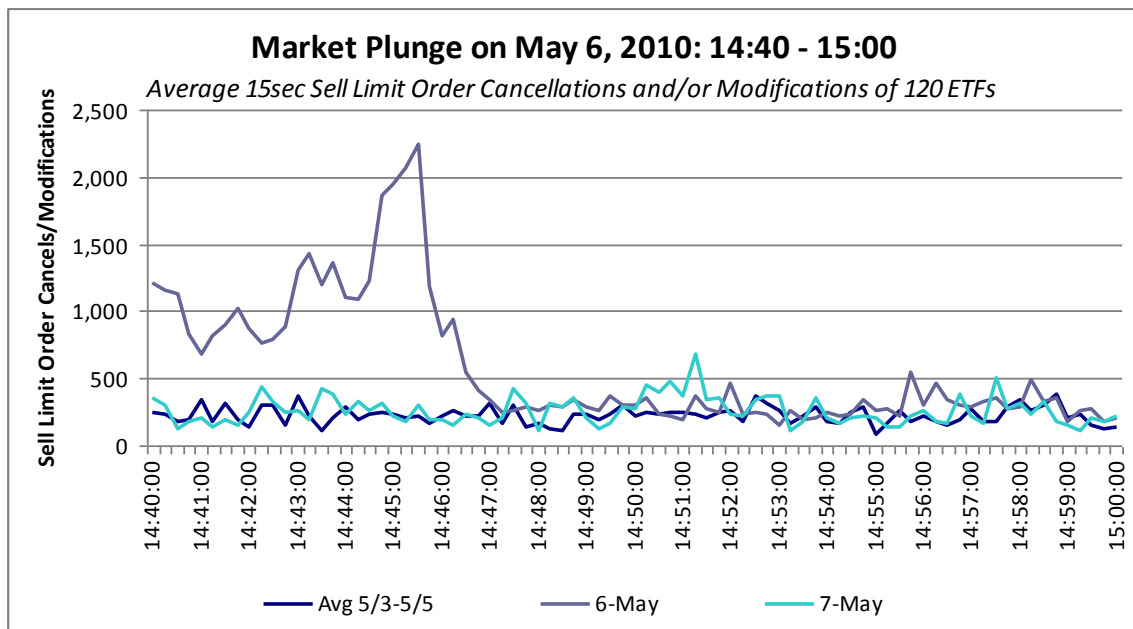
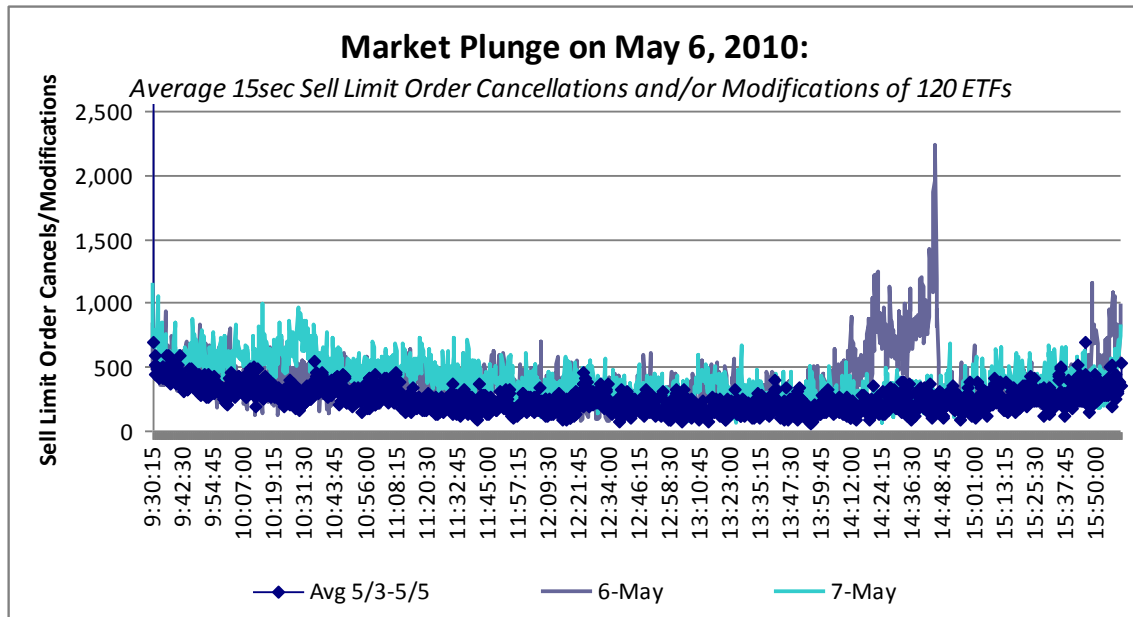
The following two charts show the average buy limit order cancellations/modifications for 120 ETFs tracked by ITG. The lines represent the average buy limit order cancellations/modifications from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.



Source: Investment Technology Group

### Average 15 Second Sell Limit Order Cancellations/Modifications

The following two charts show the average sell limit order cancellations/modifications for 120 ETFs tracked by ITG. The lines represent the average sell limit order cancellations/modifications from May 3 – 5, May 6 and May 7. The first chart shows the entire day, the second chart the 20 minute period from 14:40 to 15:00.



Source: Investment Technology Group