D E Shaw & Co

Statement of Dr. Anoop Prasad
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Joint CFTC-SEC Advisory Committee on Emerging Regulatory Issues
June 22, 2010

Chairman Gensler, Chairman Schapiro, Members of the Joint Committee, good afternoon. My name is Anoop Prasad, and I am a managing director of the D. E. Shaw group responsible for our quantitative equity investing strategies. I appreciate the invitation to be here today and share our perspective on the unusual market events of May 6th in support of your review process.

By way of background, the D. E. Shaw group is a global investment firm serving predominantly institutional investors, such as funds-of-funds, pension funds, endowments, insurance companies, and other sophisticated investors. We are headquartered in New York, with 16 offices across North America, Europe, and Asia. We are a diversified, multi-disciplinary firm, employing investment strategies based on quantitative and qualitative research in markets around the world.

I jointly oversee the firm's quantitative equity investing, or what is commonly called "quant" or statistical arbitrage investing. When we were founded in 1988, we focused primarily on quantitatively-based investing. Over the years we have diversified so that today we are active in a much broader array of asset classes and investment strategies, including macro, energy, credit, futures, options, private equity, venture capital, and more. Our goal is to apply our analytical rigor and careful risk management across various disciplines to produce for our investors attractive risk-adjusted returns that are largely uncorrelated with major asset classes and style factors.

Quantitative techniques remain a central focus of the firm's activities, and are used to identify underpriced and overpriced instruments, to manage portfolio risk, and to reduce the costs of transacting. In support of this goal, like most investment firms, we make significant use of technology. Technology is the active ingredient behind a broad toolkit that includes risk management systems, proprietary modeling and trading software, transaction cost and alpha generation analysis, and data management platforms, which together help us to manage our many thousands of firm-wide investments.

I would distinguish our investing strategies from "high frequency trading," which has been widely discussed of late and defined in many ways, ranging from the more common use of low-latency trading technology to the relatively small universe of ultra-high speed proprietary trading. While our quant equity group employs various sophisticated techniques to maximize trading efficiency, our investment horizons can be weeks or months, far longer than those of participants in the high frequency space. (And obviously certain of our investment groups, such as venture capital, have horizons of years.) In addition, while much of our equities trading is done electronically, we also have a team of traders that manages larger orders for the best execution, given whatever is going on at that moment.

Our quantitative equity investing models begin with an economic or financial hypothesis, often obtained through intuition, past experience, research, or anecdote. Our team of quants, programmers, and traders then tries to frame rigorous tests to refute or validate this hypothesis. If accepted, we then develop a model that can mathematically and systematically implement the idea. This approach tends to help us avoid the pitfalls of data mining, by increasing the likelihood we're trading what we understand rather than random noise, and by giving us insight not only for why a model works, but also for when it might stop working. Moreover, it preserves a continual interplay between our systems and our staff, balancing computer analytics against human discretion and practical knowledge.

The firm has been trading this particular equity strategy, and using quantitative techniques more generally, since 1989. We were founded in 1988 by a computer scientist, and are widely recognized as one of the pioneers in the field of computational finance. Underlying this leadership is an appreciation for both the powers and limitations of technology in the marketplace. As investors, we recognize that quantitative techniques can be enormously beneficial: they increase scale, lower costs, systematize analysis, and democratize access, as technology has done in so many fields over the past decades. At the same time, however, we recognize that quantitative models are only as good as the people who design, monitor, and amend them over time.

When we look for investment opportunities, we are not studying phenomena that can be easily replicated or explained away in a few axiomatic principles. In my case, I come from the world of physics. Many of my colleagues at the firm have a similar background. But while we like to apply scientific methods, we never lose sight of their inherent limitations in modeling for human behavior. So we have what I think is a very healthy skepticism about our or anyone else's ability to systematically predict the vast preponderance of events in the financial world. Our trading software reflects this skepticism and is designed accordingly, with guardrails to check programmatic exuberance, limit use of potentially corrupt data, and manage other sources of systems risk.

Looking at the events of May 6th, we recognize that we have just one of many perspectives and that the staffs of the two Commissions have already produced extensive analysis, which we and other market participants continue to study. From our standpoint, the unusual volatility of that afternoon was a dramatic and particularly broad instance of smaller, more contained market anomalies that occur from time to time in the complex ecosystem of today's equities and futures markets. It is a complicated market structure we all work in today, with multiple exchanges, access points, participants, rules, and conventions, all, in some way, powered by technology. By and large, this evolution has produced advancements, increasing liquidity, aiding capital formation, lowering costs, and democratizing access, like no time before. However, the absence of uniform rules about how to respond to unusual market events furthered the uncertainty of the day.

Over our 22-year history, we have witnessed other market dislocations, perhaps not having the same dynamics as this one, but sharing the element of surprise and in some cases having much greater long-term impact. Periodic disruptions are the reality of a complex market structure and this likely underscores why, notwithstanding extraordinary efforts to date, neither the

Committee nor the two Commissions have identified a "smoking gun." We share the view that there was no one single cause. Absent a single "fat finger" error or the equivalent, we are left to look at patterns and interplays, seeking to identify links in the chain that exacerbated instability and could be mitigated.

First, we want to emphasize that financial market trading does not take place in a vacuum. The day of May 6th began dramatically, with enormous volatility experienced in interest rate and currency markets as the world watched Europe's credit troubles unfold, dramatized by the riots in the streets of Athens on every trading floor's TV screens, well before and seemingly far removed from later dislocations in the U.S. equity markets. These events called into question the global economic recovery and exacerbated the skittishness of markets against the backdrop of heated Congressional debates on a new regulatory landscape. Remembering this context is important, as we believe the volatile macro-economic environment enabled rational actors to view the beginning of the drop as part of a legitimate, large market correction, particularly following the run-up in the U.S. equity markets over several months.

Through the afternoon trading volumes grew and price and execution data feeds from some venues began to get delayed. At the same time trading was slowed at the NYSE. As a result, liquidity supply at that venue became largely unavailable, while liquidity demanders simply flooded alternate venues, leading to a temporary but systematic supply/demand imbalance. The combination of delayed and unreliable quote and execution data combined with inconsistent policies at different trading venues and an ecosystem that includes market orders, stop loss orders and other order types resulted in rather perverse dynamics in the limit order books of a number of stocks and ETFs, including quotes and executions at unrealistic prices. Another factor, or perhaps an alternative interpretation, was that bad data as well as other events drove the typically matched timescales for liquidity provision and liquidity demands out of alignment. There was about 10-15 minutes of whipsaw movement before the usual dynamic equilibrium was restored and price levels, spreads, and book depths became orderly again.

Our firm has learned a lot over the past two decades, and so our systems and our people are trained to recognize unusual situations and not to trade on likely erroneous data. While May 6th was unusual, there are periodically other, smaller instances of these same events. Simple instances of bad data are also still possible even in the most efficient markets. What we term "potentially corrupt data" or "PCD" controls prevented our quant equities strategy from trading on the wildest of the bid/offers shown in the market that day, and so despite thousands of trades in that strategy, we did not have any of them cancelled. We were gratified that our risk management systems effectively protected our investors' capital during these events, which impacted many very seriously.

We do not have access to the full set of data that the regulators are now analyzing and offer our observations under this limitation. However, it is our view that, even in the most efficient and smoothly functioning markets, bad data will remain and systems problems will occur. It is incumbent upon participants to set up the necessary guardrails to control for data integrity and mitigate their exposure to unforeseen market movements. Because anomalies, errors, and panics are not completely preventable, we support the recent circuit breaker rules that have been put in place by the exchanges. The short trading halts and orderly reopening procedures

seem like a reasonable response that will give market participants a chance to assess information and allow the order books to rebalance, even on bad days. We also think it is appropriate that the trading halts will be employed when prices rise or fall too quickly as inaccurately high prices can be just as damaging to investors as sudden declines. As the application of the new rules expands to cover more securities, there will be some need to tailor them to lower priced and less liquid stocks and to observe their impact on trading of single stocks and indices in both equity and futures markets to see if further refinements are needed.

By the same token, we think market infrastructure needs to be enhanced so that there is sufficient capacity to provide timely, accurate information to investors on pricing. Quote and print delays create confusion under any circumstance, but are particularly harmful in extreme circumstances and exacerbate uncertainty and volatility. Just as electrical power grids have to be built for peak capacity, our markets must allow for the dependable flow of information on days of high or low volume and volatility.

Another observation is that investors placing market orders (and stop loss orders), which often tend to be retail investors or institutions acting on behalf of retail investors, were disadvantaged by these order types under the extreme conditions of a rapidly declining market (and would be so disadvantaged, on the flip side, in a rapidly rising market). Limit orders, on the other hand, fared better and limited risk for those employing them, our firm included. We understand that regulators are examining market orders and where their use is most appropriate.

Rules for markets should be clear, consistent, and uncomplicated. Inconsistent, unclear rules will create confusion in extreme situations, where uncertainty is most damaging. Complicated rules in today's complex and interrelated structure are almost guaranteed to produce unintended consequences. At the same time, we recognize regulators' need to understand the events of May 6th and be equipped with the tools to identify issues with our markets as they continue to evolve. We're encouraged by the considered consultation both agencies have engaged in with market participants over the past couple of tumultuous years and are glad to be of help where we may provide constructive insight or ideas.

Both the SEC and the CFTC have gathered extensive data available, and we understand their staffs continue to analyze a set of hypotheses around the market events of that day. We previously shared with SEC staff some brief analysis we conducted in the days immediately following May 6th, and I have attached those charts to my written testimony for the Committee's reference.

Finally, we wanted to note the importance of the SEC's current review of U.S. equity market structure. We think the equity markets' functioning and efficiency have measurably improved over recent decades due to greater competition and the use of innovative technology, but we also think it is important to periodically step back and assess whether all the processes are working as well as they might.

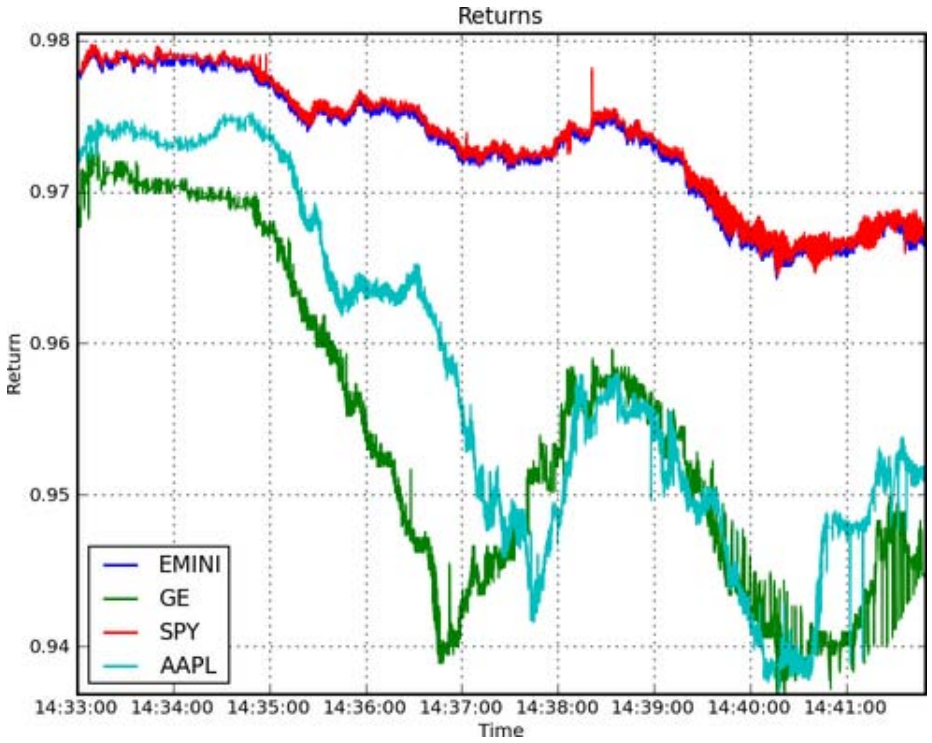
Thank you again for the opportunity to be here and I look forward to taking your questions.

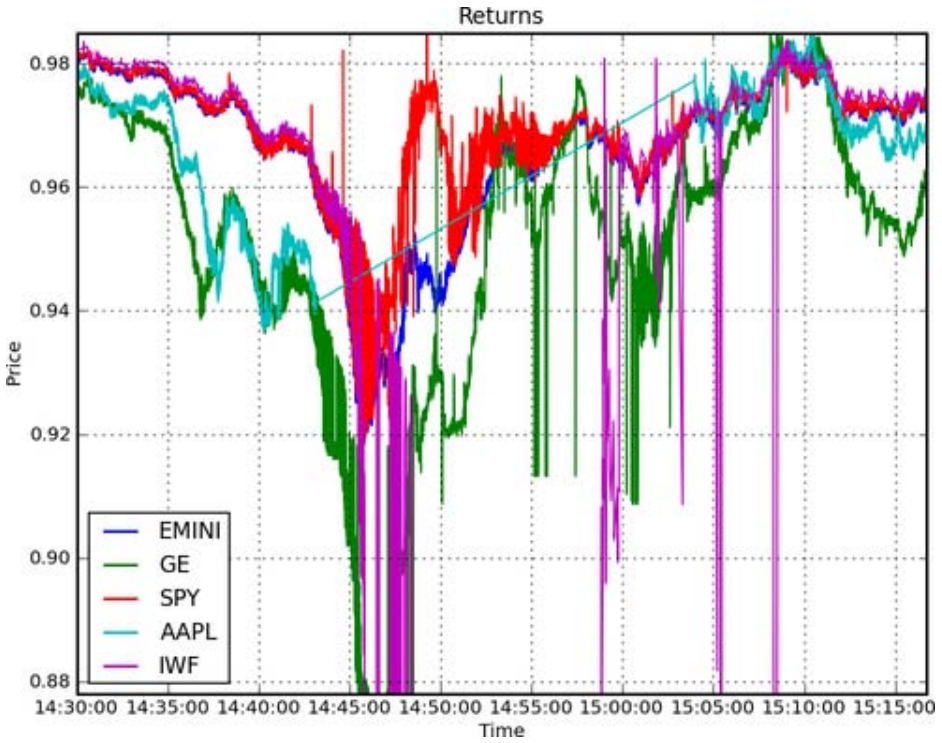
MAY 6th MARKET EVENTS: IN-HOUSE ANALYSIS OF THE D. E. SHAW GROUP

The first sign of something unusual actually appears to be GE and AAPL. The non-contemporaneous dips in different stocks appears here too (here GE's and AAPL's nadirs are off by a minute). These precede PG/ACN by ~10 minutes, however they happen in a backdrop where the S&P as a whole is well behaved and without the LOB doing crazy things.

ROUGH TIMELINE:

14:35	GE and AAPL drop 3% in ~two minutes, although this drop seems orderly (in that NMS holds) ß (see first plot)
14:37 - 14:40	GE and AAPL recover 2% and drop 2% again in 3 minutes
14:42:45 - 14:44:30	S&P 500 EMini starts drop about 1.5% in about 1 min 45 sec
14:44:15 - 14:45:45	S&P 500 EMini drops 3.5% in about 1 min 30 sec
14:45:17	We saw orders stop in the ARCA book for IWF
14:45:40	The IWF ETF starts acting strange and begins its massive drop
14:46:20	PG starts falling, other stocks follow, with no liquidity on the bid side, and prices fall to zero





May 25, 2010