Circuit Breakers and New Market Structure Realities

China’s dramatic and short-lived experience with market circuit breakers at the start of the New Year has revived debate about whether such market interventions do more harm than good, as regulators and market participants around the world continue to grapple with new market structure realities and the law of unintended consequences.

While many developments in modern equity markets have benefited investors in the form of greater efficiency and lower costs, they have also led to highly complex and fragmented markets. The rise of electronic market makers and high frequency traders has transformed the speed at which price information is exchanged and trades executed. Market plunges such as the Black Monday crash of 1987 and the Flash Crash of May 2010 have prompted regulators to seek ways to balance protecting investors from severe market declines while minimizing disruptions that come from interrupting markets and curtailing normal price discovery.

But there are questions about whether regulators have been able to keep up with today’s high-speed markets, with one trader likening them to police on bicycles trying to catch Ferraris. Regulators themselves have admitted as much. Testifying before the US Senate Committee on Banking after the Flash Crash of 2010, former SEC Chairwoman Mary Schapiro said: “One of the challenges that we face in recreating the events of May 6 is the reality that the technologies used for market oversight and surveillance have not kept pace with the technology and trading patterns of the rapidly evolving and expanding securities markets.”

In response, a growing number of equity and equity-related markets (e.g., futures and listed options) around the world have introduced circuit breakers in the form of stock-specific and market-wide trading halts as well as price limit bands in order to stabilize markets when, as the SEC has said, “severe market price declines reach levels that may exhaust market liquidity.”

The 10 largest (by value traded) equity markets around the world have already implemented or are planning to introduce some form of circuit breaker or price limit (Figure 1). In addition to equities and their derivatives, circuit breakers are also under consideration for Treasury bond and foreign exchange markets that have seen unusually high levels of volatility in recent years.

Figure 1: Circuit breakers and price limits in global equity exchanges

Market stabilization measures employed on the ten largest stock exchanges by total value traded in 2013 according to World Federation of Exchanges (2013). The second column indicates whether the exchange employs measures to stop all trading under certain circumstance (circuit breakers). The third column indicates whether the exchange uses price limits (trading is prevented outside certain bands but trading within the bands may still occur). The fourth column reports the total value traded on the exchange during 2013 in billions of US dollars. The fifth column indicates whether these measures are applied to individual securities, or to a market-wide index.

<table>
<thead>
<tr>
<th>Exchange</th>
<th>CBs</th>
<th>Limits</th>
<th>Value ($bn)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYSE &amp; NASDAQ</td>
<td>Yes</td>
<td>Yes</td>
<td>21,294.90</td>
<td>Market-wide CBs, stock specific limits</td>
</tr>
<tr>
<td>Shanghai &amp; Shenzhen SEs</td>
<td>No</td>
<td>Yes</td>
<td>6,943.04</td>
<td>Stock-specific price limits</td>
</tr>
<tr>
<td>Tokyo Stock Exchange</td>
<td>Yes</td>
<td>Yes</td>
<td>5,804.18</td>
<td>Market-wide CBs, stock specific limits</td>
</tr>
<tr>
<td>London Stock Exchange</td>
<td>Yes</td>
<td>No</td>
<td>2,076.18</td>
<td>Stock-specific circuit breakers</td>
</tr>
<tr>
<td>NYSE-Euronext (Europe)</td>
<td>Yes</td>
<td>No</td>
<td>1,532.47</td>
<td>Stock-specific circuit breakers</td>
</tr>
<tr>
<td>Toronto Stock Exchange</td>
<td>Yes</td>
<td>Yes</td>
<td>1,272.17</td>
<td>Coincides with US markets</td>
</tr>
<tr>
<td>Deutsche Bourse</td>
<td>Yes</td>
<td>No</td>
<td>1,233.90</td>
<td>Stock-specific circuit breakers</td>
</tr>
<tr>
<td>Hong Kong SE</td>
<td>No</td>
<td>Yes</td>
<td>1,215.01</td>
<td>Stock-specific price limits planned from mid-2016</td>
</tr>
<tr>
<td>Korea Exchange</td>
<td>Yes</td>
<td>Yes</td>
<td>1,201.44</td>
<td>Market-wide CBs, stock specific limits</td>
</tr>
<tr>
<td>Australian SE</td>
<td>Yes</td>
<td>No</td>
<td>821.31</td>
<td>Stock-specific circuit breaker</td>
</tr>
</tbody>
</table>

But China’s example vividly demonstrated that far from stabilizing markets, circuit breakers have the potential to exacerbate the problem they are seeking to solve. By acting as a magnet for other sellers eager to unload their shares before markets shut down, circuit breakers can intensify panic selling. UCLA Professor Avanidhar Subrahmanyam, who specializes in market structure issues and behavioral finance, described this potential magnet effect nearly a decade ago as US regulators were tightening rules around trading limitations. Less than one week into the new trading year, China’s nervous retail investors provided the empirical evidence for Subrahmanyam’s theory.

Barely unveiled by the China Securities Regulatory Commission (CSRC) for 2016, China’s tight circuit breaker thresholds were triggered twice on the very first day of trading. Concerns about China’s economy and a pending expiration of selling restrictions on large shareholders drove a New Year’s sell-off on China’s benchmark CSI 300 Index, taking major global equity markets down with it. The S&P 500 had one of its worst New Year’s opening days in its history.

The initial 5% decline in the CSI 300 Index on Monday afternoon local time triggered a 15-minute trading halt, meant to allow the market to recalibrate. Instead, amid fears of further declines, investors headed for the exits en masse when the market reopened; within 7 minutes, the market fell to the down 7% mark, the level at which the circuit breaker shuts down trading for the rest of the day. Contrasting the US experience with circuit breakers, a commentator on Weibo, the Chinese version of Twitter, wrote: “The US adopted the circuit breaker system in 1988, and it was only triggered once. The history of China’s circuit breaker is one day and we’ve triggered it twice.”

Despite massive share buying by state-controlled funds after Monday’s rout, Thursday’s market session lasted barely 30 minutes before each threshold was again breached and trading was ended for the day. The CSRC announced the same day it was suspending circuit breakers as they were “deepening the sell-off.” “On balance,” the CSRC said, “the current negative impact outweighs the positive effect.”

Critics of the circuit breakers said the trading halt thresholds were far too low for such a volatile and retail-driven market (compared with the US market-wide thresholds of 7%, 13% and 20% declines before markets close for the day). But 10% price limits already in place in China for single stocks meant that regulators had to choose circuit-breaker levels that were lower than that. Even before suspending the new rules four days into their existence, the CSRC admitted they were in unchartered waters: “The circuit breaker is an entirely new mechanism and there’s no experience (with them) in China.”

Theory vs Practice in the US

Yet the Chinese regulators are not alone in seeing well-intentioned market safeguards play out differently in practice. In the US, limit up/limit down (LULD) trading bands for single stocks were intended to provide a less blunt instrument than the trading halts called for by single-stock circuit breakers introduced in the wake of the May 2010 Flash Crash. Roughly two years after the Flash Crash, which hacked 600 points from the Dow Jones Industrial Average in a matter of minutes, the SEC replaced the single-stock circuit breakers with the new LULD mechanism. This allowed for trading to continue within a percentage level above and below the average price of the stock over the immediately preceding five-minute trading period.

But the shortcomings of LULDs and other market structure features were revealed on August 24, 2015, the first time volatility was high enough to show the complex interaction of multiple trading regulations. On that day, US markets fell sharply, beset by worries over China and commodity-dependent emerging markets. High pre-market volatility led to a chaotic morning. Ten minutes after the opening bell, nearly half of NYSE-listed equities had yet to begin trading. It was not until nearly 10 am that all S&P 500 securities opened. The result was wild price swings disconnected from fundamentals and trading halts required by LULD bands. From 2013 when LULDs were introduced across the entire US National Market System, until Aug 24, 2015, more than 8,500 LULD halts had been triggered. On Aug 24 alone, there were nearly 1,300 LULD trading halts.

This step-function kind of price discovery meant that some securities had five halts on the way down and five additional halts on the way back up, a laborious and time-consuming process. The widespread LULD trading halts caused so much disruption that some market participants recommended lowering the market-wide circuit breaker thresholds from 7% so that the entire market would have an opportunity to reset at the same time.

Other market structure and operational problems were uncovered such as the need to harmonize trading rules among futures, options, individual stocks and ETFs; a resetting of the LULD trading bands; clarification of “clearly erroneous trades; eliminating or minimizing stop-loss orders; and a streamlining of complicated market opening procedures that had delayed trading.
Anomalous Price Deviations vs Market Corrections

As is often the case with reforms, one apparent remedy can itself give rise to additional problems, and rarely is there a one-size-fits-all solution, as any trading halt or price limit rule needs to consider the costs and benefits for a particular market under particular conditions. Circuit breakers in the US have been adjusted multiple times since former Treasury Secretary Nicholas Brady introduced them in 1988 following the 1987 crash. Brady recently defended circuit breakers again, even after the disruptions seen in China, saying Chinese regulators had neglected to calculate ones suitable for their markets. Defenders of circuit breakers as a time-out for markets say they are needed more today than ever before as the speed of trading has outpaced how quickly human brains can process that information.10

Meanwhile, academic research on the effectiveness of circuit breakers and price limits is inconclusive. Opponents say mandated trading halts interrupt the natural movement of security prices and introduce unnecessary and artificial barriers.11 Similarly, some poke holes in regulators’ asserted goals of protecting unsophisticated investors from unusual market price declines. Professor Subrahmanyam, for example, has found that informed traders may reduce their trading in anticipation of a trading halt, resulting in higher trading costs for small investors.12

Other studies, however, find that price limits promote the sharing of risk in markets when price shocks arise before investors can implement desired trades. They can prevent extreme price changes due to speculation and give traders time to acquire and assimilate information in fast-moving markets.13

Other research is directed at finding ways of using high-speed computing to anticipate market stress and slow markets down so that trading halts will no longer be needed, but practical applications appear years away.14

Importantly, most studies distinguish between circuit breakers designed to provide investors with a breather in cases where prices have severely decoupled from fundamentals as on August 24 or 2010’s Flash Crash, and those that are triggered during a market correction. The primary risk of markets without circuit breakers, says Lucy Ackert, a researcher commissioned by the British government to study the impact of circuit breakers on market outcomes, is that investors can overreact and send markets into a self-perpetuating downward spiral that is unwarranted by market fundamentals.

A world with no impediments to trade is optimal if all traders are rational, do not make errors, and are able to develop algorithms that incorporate all possible contingencies. Since we do not live in such a world, safeguards like a market circuit breaker rule with wide thresholds and a limit up-limit down mechanism are prudent.15

“If, however,” Ackert says, “a price adjustment is just a correction, a trading halt will likely only postpone the inevitable.”16 The SEC says market-wide circuit breakers were never intended to prevent markets from adjusting to new price levels; “rather, they provide a speed bump for extremely rapid market declines.”17

In the case of China, it is more difficult to know whether prices have severely decoupled from fundamentals or if a further market correction is warranted because of the opacity surrounding important macro and company-specific information. Not surprisingly, research has found that uncertainty in closed markets exceeds that of open markets when prices are falling. But it is clear that the Chinese government is committed to intervening in markets in whatever way it deems necessary to prevent precipitous declines. Whether that will calm the markets and restore investor confidence and trust, with or without circuit breakers, remains to be seen.

Scarce Obligated Liquidity & Market Confidence

That combination of confidence and trust is especially important considering the paucity of obligated liquidity providers in today’s transformed markets. The capitalization profile of market makers today is far different than before the financial crisis. Virtu, one of the world’s largest market makers, has the revenue of a median company in the S&P Small Cap Index, with just 150 full-time employees. Because of regulatory changes, market-making activity has migrated away from larger, well-capitalized banks to smaller, non-diversified trading companies. Those companies have little to no regulatory obligation to provide liquidity, nor do they have the client relationships that tend to bind market makers with market participants. As their size has shrunk, their influence has grown, as markets cannot operate efficiently without both sufficient liquidity and market depth.

What Is to Be Done?

China’s New Year pyrotechnics provide a cautionary tale about local market volatility that can quickly spread around the globe as well as the ongoing challenges regulators face finding the right tools to address unusual market volatility. While regulators in most major equity markets appear prepared to step in with safeguards in some form, the disruptions in China as well as in the US in late August show that markets with very different conditions are still struggling to find the right way to implement and calibrate volatility control mechanisms.

At the very least, both cases seem to emphasize the need for holistic approaches to individual markets so that single-security and market-wide mechanisms are not undermining each other and are harmonized across related markets (e.g.,
Circuit Breakers and New Market Structure Realities

Equities, options, and futures). How markets re-open after a trading halt and the level of transparent price indications prior to re-opening are another two key areas that need improvement in order to bolster confidence for re-entering the market. While markets usually do find their point of equilibrium after periods of volatility, investors should consider the kinds of trading precautions they can take to weather the storm such as implementing limit orders and avoiding trading at the start and end of the trading day when price dislocations can be most severe. The speed, complexity and interconnectedness of global capital markets are not going away. It will require a collaborative effort on the part of regulators, exchanges, market makers and investors alike to address the challenges posed by new market structure realities and create the solutions required to ensure resilient capital markets around the world.

ssga.com

For public use.

State Street Global Advisors Worldwide Entities

United States: State Street Global Advisors, One Lincoln Street, Boston, MA 02111-2900. T: +1 617 664 7727.

The information provided does not constitute investment advice and it should not be relied on as such. It should not be considered a solicitation to buy or an offer to sell a security. It does not take into account any investor’s particular investment objectives, strategies, tax status or investment horizon. You should consult your tax and financial advisor.

Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income. Performance of an index is not illustrative of any particular investment. It is not possible to invest directly in an index. Risk associated with equity investing include stock values which may fluctuate in response to the activities of individual companies and general market and economic conditions.

² Mary L. Schapiro, “Examining the causes and lessons of the May 6th market plunge,” Testimony before the Subcommittee
⁶ An index of the 300 biggest stocks listed in Shanghai and Shenzhen.
¹³ Ackert.
¹⁵ Ackert.
¹⁶ Ackert.

The views expressed in this material are the views of Global Equity Beta Solutions Team through the period ended December 31, 2015 and are subject to change based on market and other conditions. There is no representation or warranty as to the current accuracy, reliability or completeness of, nor liability for, decisions based on such information and it should not be relied on as such. All material has been obtained from sources believed to be reliable, but its accuracy is not guaranteed. This document contains certain statements that may be deemed forward-looking statements. Please note that any such statements are not guarantees of any future performance and actual results or developments may differ materially from those projected. Past performance is not a guarantee of future results.

Investing involves risk including the risk of loss of principal. The whole or any part of this work may not be reproduced, copied or transmitted or any of its contents disclosed to third parties without SSGA’s express written consent.

All the index performance results referred to are provided exclusively for comparison purposes only. It should not be assumed that they represent the performance of any particular investment.

Diversification does not ensure a profit or guarantee against loss.