The Lessons of 1987: Thinking Back After A Decade of Response

by Andrea M. Corcoran

It is not surprising that the ten-year anniversary of an event of the magnitude of the stock market crash of 1987 should inspire reflections on what we have learned since then. Such reminiscences of the event seen through the filter of the passage of time can be particularly poignant where, as today, we have been experiencing a bull market of unprecedented duration. The level of investor enthusiasm is so high that the Chairman of the Board of Governors of the Federal Reserve was inspired earlier this year to caution against "irrational exuberance" and to suggest in recent Congressional testimony that the "equity premium" is diminishing and that a significant correction would not be unexpected.

Regulators regularly warn that it is foolhardy to make assumptions about the direction of the market. Indeed, being wary of assumptions is a first principle of risk management. That being said, regulators are tasked with overseeing that the financial systems in place are sufficiently robust to withstand a system-wide shock irrespective of which way the market is moving. In futures markets, large price gains can cause financial distress as easily as large price declines. This means that futures regulators can neither afford to be lulled by optimistic forecasts nor to act precipitately if worried by public pessimism about the direction of prices.

This article will revisit the events of 1987 from the perspective of a futures market regulator. It will review:

- What happened and what did not happen in 1987;
- How the CFTC in conjunction with other U.S. regulators acted to remedy the weaknesses exposed by the events of October 19 and 20 and to minimize the risks experienced; and
- How relevant these lessons are for today.

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What Happened

On Friday, October 16, 1987, the Dow dropped 100 points, the first time ever the Big Board had experienced a one-day loss of more than 100 points. The New York Stock Exchange traded 338.5 million shares on that day as the market fell to 2,246—17.5 percent below its all-time August 25 high of 2,722.40. On October 19, ("Black Monday"), the Dow had dropped 201 points by 11 A.M., 296 points by 3 P.M. and 508 points by the close of trading or a total of 22.6 percent. With volume in excess of 600 million shares, this decline was nearly twice as large as that of each one-day decline on October 28 and 29 during the crash in 1929 that preceded the Great Depression. Moreover, much of the 1987 loss occurred in the last minutes of trading.

On October 20, the financial repercussions of the previous session's sell-off were felt by clearing, settlement, and credit systems experiencing unprecedented cash flow demands and near panic uncertainty as emergency closings were instituted at the Chicago futures exchanges.

On the CME, where the S&P 500 stock index futures contracts were (and are) traded, $2.5 billion in original and variation margin was assessed on Monday, more than $1 billion of which remained outstanding for collection at the next morning's settlement. Rumor was rampant that credit banks were unwilling to extend credit to broker-dealers and futures commission merchants to make settlement. Allegedly, persons in a position to make decisions on meeting the unusual demand for credit on that day were not at their desks ready to make such decisions when the markets opened on October 20.

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The Immediate Response

The demand for explanations and solutions was immediate. Indeed, at one Congressional hearing a noted Senator demanded of Securities and Exchange (SEC) Commissioner Cox why the SEC had not anticipated the decline and either forewarned persons or prevented its occurrence. Numerous reports were produced on the event, including reports commissioned on behalf of the New York Stock Exchange (Nicholas Katzenbach), the Chicago Mercantile Exchange and the Board of Trade (Merton Miller), a blue ribbon commission appointed by then President Reagan (the Brady Commission); and the General Accounting Office. The SEC and the CFTC each produced a report on its version of events at the time and each was required by the Market Reform Act of 1990 to report for five years thereafter on the status of the workplan to remediate exposed weaknesses.

Speculation that potential clearing breakdowns could have threatened financial collapse engendered private sector reports by the Group of Thirty (a group of international banks and investment banks) and the Bachman Commission. The President's Working Group on the Financial Markets (chaired by the Secretary of Treasury and comprised of the respective chairmen of the SEC, CFTC and the Board of Governors of the Federal Reserve System assisted by appropriate staff) was convened to coordinate the responses of various financial regulators and itself issued an interim report in May 1988.

Internationally, the London International Financial Futures Exchange issued a report and the International Organization of Securities Commissions Organization (IOSCO) established a Technical Committee of twelve securities markets representing the developed economies to take a hard look at securities clearing and other matters that had caused world-wide concern.

Although the media was quick to blame various trading strategies such as index arbitrage and portfolio insurance (sometimes referred to as program trading), the official reports were reluctant to overemphasize technical, as opposed to fundamental, economic forces when evaluating the October decline. Some did say that futures (and options) led the cash markets down, but most focused on the facts that:

- Volume overwhelmed processing capacity;
- Market participants withdrew because they feared the accuracy and timeliness of information, the availability of liquidity, and the solvency of particular counterparties; and
- Concerns about the fragility of existing settlement systems and decoupling of the markets due to *de facto* or *ad hoc* market closures had led to a near state of panic.

Indeed, on October 20, there were reports that the CME was collapsing and that the New York Stock Exchange was closing. Before the NYSE had quelled the latter, in conjunction with the White House, the futures exchanges closed in anticipation. Market participants, debriefed by the Brady Commission, were concerned about delays in receiving funds through the futures settlement process. They explained that this could have had painful, if not disastrous repercussions at the fime, and could influence participants in future market disturbances to withhold funds from the market, thereby exacerbating the situation.

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Troublingly for the CFTC, the SEC found that the low cost of futures trading, and in particular the margin levels for such trading, coupled with what the SEC called the "illusion of liquidity" in futures markets and the potential use of futures as cash surrogates, materially contributed to the unwarranted rise of cash prices and, by consequence, to their drastic readjustment. The NYSE, in what some later said was a stroke of political genius, unequivocally blamed the futures markets. SEC Chairmen Ruder and Breeden both campaigned for the transfer of jurisdiction over all stock index products to the SEC. The CFTC disputed both this claim and the proffered jurisdictional solution, specifically finding, based on

an analysis of the trading data, that most cash-related selling was *not* futures related.

Because of the difficulty of assigning ultimate causes, most of the reports' recommendations focused on assessing and addressing perceived malfunctions in the "plumbing" or operational features of the markets. Although the actual implementation was not immediate (the cross-market trading halts now known as "circuit breakers" were not implemented until October 20, 1988), the financial regulators agreed a action plan that called for:

- Additional oversight of margin;
- Improved information between the markets;
- Measures to prevent *ad hoc* delinking of the markets; and
- Operational and resource enhancements to trade matching and clearing systems.

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Most groundbreaking (although symmetric price limits had long existed in futures markets) among these proposals established downside circuit breakers or trading time outs that occurred simultaneously in the cash and futures markets upon a specified decline in the Dow. The circuit breakers that ultimately were developed after extensive jawboning of the markets were set both sufficiently high and low not to interfere with normal volatility but to permit the absorbtion of new price information in an orderly fashion. This was to prevent market delinking and operational or credit failures being induced by intra-day price whip saws or temporary cash flow delays.

Setting such limits in advance was intended explicitly to avoid calling an emergency market halt on the theory that emergency suspensions could communicate additional panic rather than having the calming—time out effect—the halt was designed to achieve. There remains a spectrum of views even today about the utility of circuit breakers among market professionals and economists. But, it seems that the public has embraced them as market protections and has credited them with maintaining orderly markets in multiple recent significant price swings.

The markets themselves set additional prophylactic limits directed at limiting or slowing volatility. The NYSE modified the means of executing arbitrage and program trading (i.e., NYSE Rule 80A and the sidecar rule). And the futures markets adopted pre-circuit breaker price limits (sometimes known as "speed bumps"). Futures price limits, unlike halts, permit trading off the limit, (that is, above a floor or below a ceiling). While theoretically impure, the speed bumps have the advantage of permitting demonstration of contrarian demand, and can be complete assurances that clearing-related cash flow requirements on any one day will be limited. Although some have criticized that these intermediate limits are hit too frequently, many market participants believe that, during the volatile times experienced since 1987, these limits have had an ameliorative effect and continue to take comfort in their existence.

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None of these arrangements, designated by one SEC Commissioner as "sand in the gears," however, has been tested by a decline in price expectations equivalent to that of Black Monday. Moreover to reflect that the percentages of decline represented by the original circuit breakers would be vastly reduced at today's Dow levels, the various exchanges, just this year, altered the original circuit breakers of 250 points (one hour time out) and 400 points (two-hour time out), then corresponding to 12 and 20 percent declines, expanding them to 350 and 550 points respectively and also shortening the time-outs to one-half and one hour at the urging of current SEC Chairman Arthur Levitt.

The Remedial Program

With Respect to Capacity.

Every report found that during the market break, selling volume overwhelmed exchange systems and in some cases NYSE specialists and other market makers withdrew. Certain securities trade-matching systems apparently were "locked" by traders entering prices outside the limits, triggering system fail safes which shut down trading. In 1987, the average trading volume on the New York Stock Exchange was 220 million shares. Today, the average volume of 500 million shares exceeds the total capacity of the NYSE at that time. The NYSE president recently reported to the *Wall Street Journal* that the exchange's capacity is now 2.5 billion, more than four times its average daily trading volume.

Multiple changes to improve capacity and operations have been accomplished in all markets. On the futures side, the CME had a record day in February, 1994 when it traded 2.2 million contracts overall, and it has doubled its trade processing capacity since that time. The CME now has real time trade matching and requires trade submission within one hour of the end of the time bracket in which a trade is executed.

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Further, between 60 and 80 percent of the settlements due, based on the days change in value of positions, are settled on the same day. Cash flow demands have been reduced by:

(1) both collecting and paying margin intra-day (formerly the exchanges only collected leaving parties gaining in the futures markets without capacity to make payments elsewhere until the funds were released on T+1);
(2) coordinating payments among the Chicago futures and securities options exchanges; and
(3) by cross margining between securities options and futures markets, thereby permitting option value to offset futures declines.

These changes have significantly reduced the amount of cash being moved through our financial markets notwithstanding the overall increase in daily trading activity.

With Respect to Liquidity

On October 20, some banks were slow in making credit determinations and settlement payments. As monies generally are invested on a 24-hour basis, clearing and settlement systems which transfer money from one party to another are inherently credit systems. Payments regularly are promised under banking arrangements on behalf of clearing members in advance of actual bank receipt of funds. It was alleged that, because of the doubts of credit banks about the security of the futures settlement system on October 20, certain payments were held up, thus threatening gridlock.

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Liquidity of funding is critical to management of a system-wide reassessment of market values. To address this possibility without frustrating the ability to keep monies working around the clock, a number of changes have been made to futures-related clearing and payment systems. Agreements with settlement banks have been clarified to assure that settlement is final when the bank confirms payment instructions and that payment becomes the bank's liability at that time, removing—at least contractually—fear about potential reversals if the banks become frightened about trading trends before payment becomes final.

Confirmation time by settlement banks has been moved up in both the futures and options markets to before trading begins. This timing is intended to facilitate assurance to the marketplace that settlement will occur. Because futures markets are zero sum, once the settlement banks confirm payments, all parties expecting collections should be able to relax. To discourage overextension of credit, the banking authorities have imposed costs on daylight overdrafts, creating disincentives for withholding or floating funds.

Resources available to the clearing house have been improved as well. Guaranty funds have been liquefied (that is, converted to cash and cash equivalents) to avoid the situation where drawing on a fund capitalized with uncollateralized letters of credit could place further demands on credit systems in a time of crisis. Futures clearing organizations also have increased their capital and their access to credit lines and the agreements establishing confirmed lines explicitly provide that they will fund in the event of threatened grid-lock of the settlement process as well as in an event of default.

The clearing organizations are in frequent routine contact with the banks about settlement instructions, margin calls, and credit lines, thus alerting the banks about exchange actions in advance of expected volatility and during periods of market turbulence. Importantly, the FedWire which was unavailable or out of commission for portions of October 20, 1987, has been improved. Operating hours have been extended on an as needed basis and (as continuously advocated by the CFTC) beginning December 1997, the funds line will open at 12:30 A.M.—facilitating payment finality before the open of trading. Discussions are also underway on extending the hours of the securities wire. As a general matter, the CFTC has emphasized that maintaining liquidity arrangements sufficient to fund obligations to the market under volatile conditions is a required component of market and firm systems of internal controls.

With Respect to Better Information on Exposures and Counterparties

The CFTC has advocated the cross market sharing of information on large exposures since the default of Volume Investors in 1985. The day after the 1987 crash, the Chicago Board of Trade added its signature to an agreement for sharing pay and collect information on line for common members of participating markets, which, as of its signature, included all U.S. futures markets. After the 1989 mini-crash, as previously urged by the CFTC, the Options Clearing Corporation joined the agreement. And, in September 1995, the Unified Clearing Group, in a major move, agreed to develop templates for sharing similar clearing information for securities markets.

Such cash flow and collateral information has been a vital resource to the Commission and the responsible self-regulatory organizations in every volatile market they have experienced since the crash. Further, the information has been augmented over time to include margin deficit and surplus information on an exchange-by-exchange and aggregate basis. Additionally, information about net pays or collects by exchange and in the aggregate for a one-day, five-day, 30-day, 6-month and 1-year period provide useful cash flow trend information to use in identifying outliers and in conducting financial surveillance.

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Also, every U.S. exchange is required to use—and uses—large trader reports to identify firms that may have customers carrying large positions on the wrong side of the market. Indeed, the CFTC is perfecting its own large trader system by adding daily, as opposed to weekly, options data. As the CFTC system can look across markets by customer as well as at exposures in a single market, its system is an important complement to exchange systems. The exchanges regularly, and especially in volatile markets, compare member capital exposures, review the largest exposures in their markets and stress test exposures against likely potential market moves to determine whether further credit steps are necessary.

The CFTC also has encouraged projecting risk to particular firms and the markets based on the effect on large exposures of potential market moves. Before anyone ever talked about stress testing positions, the CFTC was talking about "what-if?" analyses and requiring risk-based targeting of firms for more intensive review. This type of projection analysis identifies firms that, based on their positions, could experience unusual gains or losses relative to their own history and to the market. Such reviews lead to other analyses such as analysis of the currency of customer margins identifying who is in arrears in their margin payments and, in particular,

who is in deficit, and reviews of segregation compliance, currency of books and records and adequacy of internal controls systems.

The CFTC also has improved its own early warning system for firms in financial distress, highlighting particular firms for intensified oversight and adopting rules pursuant to the risk-assessment authority granted in 1992 reauthorization legislation. These steps materially enhanced its understanding of firms doing business in futures markets which are part of a group or are self-clearing positions for a parent or affiliate. In particular, the CFTC now has corporate maps identifying the affiliates of a futures commission merchant (FCM) which could materially adversely affect the FCM's financial condition. It also knows which other regulators the firm files reports with, consolidated and consolidating financial statements, and internal control procedure filings. This facilitates the location of appropriate information and how to interpret it.

Notably, unlike many other financial regulators, the CFTC has explicit powers to ask for a market participant's entire positions including unregulated as well as regulated portions of a trader's portfolio. This means the CFTC can make a special call for a large exchange trader's related over-the-counter and cash positions. Even more importantly, the Commission actually has asked for this information to assess more precisely the risk of exchange exposures that a firm claims are hedged in other markets. This type of information may be critical to reducing the potential for overreaction by any given regulator to a problem situation by providing assurance that the staying power of the regulated entity is not unduly threatened by some condition elsewhere in the organization or by some position on another market.

Separately, after the Barings collapse and the losses of Sumitomo, the Commission has aggressively pursued improving international arrangements for sharing surveillance information, in particular, working with other international regulators to identify information that is useful to address management of various types of market events in advance so that such information will be maintained, accessible, and able to be shared as needed. This effort is particularly important in that, unlike enforcement and investigatory information that is normally shared after the fact, surveillance information may be shared on a preventive basis.

Oftentimes, jurisdictions in competition with each other are suspicious that sensitive information, such as position information, could be misused, especially where the financial stakes are high. Prior agreement by the jurisdictions on the type and purpose for obtaining such information, eases the actual information-sharing process and educates the regulators. Consensus in advance on the types of information that may be relevant, limits unnecessary and damaging debate in a crisis.

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These events have led to international initiatives among markets and regulators to share large exposure information and other financial information upon the occurrence of specified trigger events. (For example, the companion agreements executed in Boca Raton in March 1996 now have 20 regulatory and 62 market authority signatories respectively.) The Commission has also encouraged its regulatory partners, in conjunction with the UK Securities and Investments Board and the Japanese MITI and MAFF, to move toward development of best practices regarding information-sharing for surveillance purposes. It has also worked with IOSCO to pursue practical guidance on information-sharing on an event-specific (i.e., firm failure, market correction) basis.

With Respect to Margin Enhancement

Despite calls to harmonize margin between futures and cash markets or to use increased margin as an instrument to dampen volatility, The President's Working Group's initial report concluded that, assuming other risk management techniques are in place:

- Maintenance margin percentages required for carrying an individual stock should be significantly higher than the percentage margin re-

The Settlement Issue Continues...

In March 1997, the Ad Hoc Study Group on Exchange Traded Derivatives of the Committee on Payment and Settlement Systems of the central banks of the Group of Ten countries reported on behalf of the Bank for International Settlements on the existing arrangements for clearing and settling exchange trades in the G-10 countries. That report focuses on the exchanges' clearing houses which are essential to the integrity of the exchanges.

The group identifies several specific sources of vulnerability in clearing risk management systems:

- Inadequate financial resources to meet losses and liquidity pressures from member defaults induced by extreme price movements;
- A lack of mechanisms to monitor and control intraday risk; and
- Weakness in money settlement arrangements, including reliance on payment systems that entail the risk of klunwinds of provisional funds transfers late in the day.

The report identifies the systems most susceptible to these potential deficiencies. It also cites several potential means to strengthen clearing arrangements as follows:

- The use of "stress testing" to identify and limit potential exposures to cleaning members from extreme price movements; and to ensure that the clearing houses' financial resources are adequate in such circumstances;
- Enhanced intraday risk management through more timely trade matching and more frequent calculation of exposures by means of more frequent settlements; and
- Strengthening of money settlement arrangements through the use of real-time gross settlement (RTGS) systems for payments and securities transfers and by clarifying settlement agreements with clearing members and settlement banks.

The annexes to the report analyze several systems.

See also, Corcoran, A "Developing Financial and Operational Performance Standards for Exchange Markets: A Modest Proposal for an International Dialogue," a paper presented to the Symposium on Risk Reduction in Payments; Clearance and Settlement Systems, (January 25-26, 1996 New York City), sponsored by Goldman Sachs. Publication pending.

quired for a futures contract on a stock index because the payment period for margins in the futures market is shorter than the period for stocks;

- "Harmonious" or "consistent" margins across cash and futures markets do not imply equal margins across cash and futures markets; and
- To be prudential (that is, to maintain financial integrity), margin need not cover all price moves.

Subsequently, the Futures Trading Act of 1992 committed margin oversight authority for stock index futures products to the Federal Reserve Board with the authority to delegate such oversight authority in the first instance to the CFTC which they did in March 1993, subject to required annual reporting as to how that authority was exercised.

Nonetheless, the CFTC separately called for fine-tuning of existing margin procedures, including:

- Review of how existing margins addressed concentrated, undiversified risks;
- Revisiting models for margining options to assure they took into account implied volatility as well as historic volatility and non-linearity; and
- How to account for the risks of collecting margin from foreign-based accounts.

In its most recent annual report to the Fed, the Commission noted that two-thirds of margin changes

for the prior year had been increases. As of August 1997, CME maintenance margin for its S&P 500 contract was set at $17,500 or sufficient funds to cover a 35 point decline of the S&P and approximately a 280 point move on the Dow. Such coverage would account for all daily price changes for the past seven and a half years. In fact, on only .06 percent of the trading days since 1983 have the markets experienced a decline that exceeded that percentage. Importantly, during the period of losses in derivatives products in 1994, the Commission conducted discussions with the CME about margining its S&P contract to the second intermediate time out, which was then approximately 150 points on the Dow, and the CME has consistently maintained at least that level of maintenance margin since.

Of course, the futures exchanges do not rely on margin alone. They combine margin with stress testing positions, parent guarantees, liquidity facilities, daily and intra-day marking to market and other risk management activities and resources. Receipt of foreign margins has been improved by requiring the gross margining of foreign omnibus accounts in the same manner as domestic accounts.

Some Lesser Known Facts on What Did Not Happen

When reflecting on the many improvements since 1987, it also is worth noting some things about the market crash:

- There were no defaults on the futures side;
- Formal complaints to futures exchanges and firms from all quarters totaled less than 50 (compared to thousands in options);
- All futures accounts were cleared and settled on T+1 even though there were a few hours of delay;
- The Brady Commission based its analysis of the October, 1987 crash on Commission trading records; in 1990 the securities markets still had not documented what had happened on that day;
- Program selling of cash stock positions without a futures counterpart accounted for significant NYSE selling and, in particular, more selling (52 million as compared to 38 million shares) than was represented by index arbitrage;
- On October 20, over-the-counter and upstairs transactions came back to the exchanges because of concern about the reliability of pricing in non-exchange markets and the availability of a cash price;
- On October 22, the futures clearing system transferred payments similar in size to those moved on October 20th without delays, suggesting delays were unique to the day and not endemic to the system.

Additionally, the Market Reform Act of 1990 gave the SEC certain powers and authorities parallel to those already committed to the CFTC:

- Emergency authority to close markets;
- Authority to obtain large positions; and

The Group of Thirty proposed certain changes to securities clearing systems that already had been achieved or exceeded on the futures side:

- Moving to book-entry
- Trade matching by T+1
- Settlement in good funds by T+3

What Is Different Today and Why We Must Avoid Complacency

This review demonstrates the resilience of the U.S. system and the steps that the U.S. government and self-regulatory authorities have taken to improve the system. We cannot, however, afford to rest on our laurels or to become complacent.

We live in a different world. Although there have been many regulatory enhancements to the financial markets, one cannot always be certain that tomorrow's threat will be met by today's defenses. There are some differences between today's and a decade's ago markets which could complicate management of a financial event:

- Today firms often engage in proprietary as well as agency business.
- Few futures firms were parts of integrated businesses in 1987. Now more than half of future brokerage firms, and most of the largest firms, are part of a group or conglomerate including other regulated and/or non-regulated entities, including banks and foreign-based entities.

- In 1987, the over-the-counter market was in its infancy. The Eurocurrency Standing Committee recently reported more than 50 trillion dollars of notional exposure worldwide in over-the-counter derivatives.
- 1997's open interest and options exposure is almost triple that of 1987.
- New smaller contracts to attract retail interest are being offered.
- Markets and firms are increasingly linked to markets and firms outside their jurisdiction and hence outside their national regulator's direct reach.
- In 1987, 812 mutual funds managed $241.9 billion in assets; today 2,855 funds control $2.13 trillion according to the Investment Company Institute, and managed investments in futures, if hedge funds are included, are at an all time high.
- Further, as E. Gerald Corrigan, formerly head of the Federal Reserve Bank of New York, and now a Chairman, International Advisors, Goldman, Sachs & Co., recently said:

  Few people, if any, understand the full consequences of the manner in which technology is influencing the flow of financial transactions and risks attendant to those flows on a global scale—the speed of change is such that it is not clear whether the net effect of technology is currently increasing or decreasing overall risk, even if it is clear that a more mature and stable technological environment should be a net plus for risk management and reduction.

Finally, although the banking regulators have set a timetable to address settlement risk, (known as Herstatt risk), this still remains an issue more than twenty years after the collapse of Herstatt Bank.

Perhaps, as important as all of the above, today's markets are aggressively international. Third party warrants on equities are widely offered offshore. In 1994, trading volume on foreign futures markets exceeded volume on domestic markets for the first time and multiple jurisdictions offer exchange contracts on equity indexes. Although there are multiple ongoing initiatives to improve the systems supporting global financial stability, some markets have yet to achieve the standard of readiness set domestically. Further, emergency interventions can still cause a market withdrawal. For example, during the recent Asian currency crisis, some criticized the across-the-board discretionary application of existing exchange rules permitting limiting short selling (a sort of circuit breaker) to address adverse market conditions.

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On balance, some of the management of financial emergencies is more art than science. There are many micro actions that can be taken, based on experience, to facilitate firm wind downs and maintain market stability. Although the CFTC has been a leader in contingency planning and practicing its emergency routines (including running cross-border stress tests or so-called financial war games on an international level), ultimately the results depend on firms and markets maintaining responsible courses of action in adversity, good contingency planning, cooperation among regulators, adequate information flow, and, of course, luck.

The financial markets are confidence systems. Intermediaries, markets and regulators alike must be vigilant because one thing is certain: markets go up and markets go down, and firms can and will fail.