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STRATEGIES

The Market Crash of '87 - Rare but Hardly Unique

By MARK HULBERT

SIXTEEN years ago today, the Dow Jones industrial average fell 22.6 percent, its worst one-day percentage decline since its creation in 1896.

Many investors are now inclined to dismiss the drop as an aberration. But new research has found that one-day price swings as big as the one in 1987 are not extraordinary. While they are rare, their average frequency over long periods is predictable.

The authors of this research are Xavier Gabaix, an MIT economics professor; H. Eugene Stanley, a Boston University physics professor; Parameswaran Gopikrishnan, an associate at Goldman Sachs; and Vasiliki Plerou, a post-doctoral fellow in the physics department at Boston University. Reports of their findings have appeared in publications including the scientific journal Nature. A copy of their study is available at http://papers.ssrn.com/sol3/papers.cfm?abstract-id=442940.

The frequency of huge daily gains and losses in the stock market has presented a perennial challenge to historians because these big moves are more frequent than would be expected if the market adhered to what is known as a normal, or Gaussian, distribution. In such a statistical pattern, sometimes also referred to as a bell curve, outliers - percentage changes that deviate significantly from the average - are extremely rare. For several years some researchers have suspected that the markets follow another pattern - a power law distribution, which predicts more outliers than a normal distribution. Power law distributions are widely recognized outside the investment arena. Earthquakes follow them, for example.

In their study, the researchers not only confirm that the stock market adheres to a power law distribution but also derive a formula that predicts how often a particular percentage change is likely to occur. They contend that they have captured a universal trait of investment markets. They have tested the formula in global stock and currency markets of varying sizes. Their findings imply that crashes are an inherent feature of markets and that investors are fooling themselves if they believe that another crash of 1987's magnitude will never occur.

Some people may believe that market changes instituted since 1987 have reduced the probability of another stock market crash. For example, the New York Stock Exchange has instituted circuit breakers that halt trading for several hours whenever the stock market declines by at least 10 percent. The rationale is that a cooling-off period will counteract the herd mentality that leads to mass selling.

Professor Gabaix and his colleagues are skeptical about circuit breakers. They have found that the stock market's outsized daily price movements are caused by large institutional investors, who generally try to trade their unwanted stocks over several days to minimize the price impact. But sometimes big traders want to sell their entire positions at once, which can spur a market crash. The researchers say that trading curbs postpone the selling but do not prevent it.

NOTE that the researchers' findings apply equally to gains and losses. That means that days in which the market rises sharply also occur more often than they would if the market adhered to a normal distribution. Except for investors who are selling short, however, few will be troubled by that possibility.

While the researchers' formula predicts how often a price move of a given magnitude will occur, it does not forecast when. According to the formula, on average a one-day gain or loss of 22.6 percent occurs once every 75 years. That could mean that another crash of 1987's magnitude will not happen in any of our lifetimes and, while it is not likely, it could also mean that there will be a crash in the next few years.

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