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## How the Journal Analyzed Stock-Option Grants

By **CHARLES FORELLE**  
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The Wall Street Journal asked Erik Lie, an associate professor of finance at the University of Iowa who has studied backdating, to generate a list of companies that made stock-option grants that were followed by large gains in the stock price.


The Journal examined a number of the companies, looking at all of their option grants to their top executive from roughly 1995 through mid-2002. Securities-law changes in 2002 curtailed the potential for backdating a grant. Executives typically receive option grants annually.

Mr. Lie and other academics say a pattern of sharp stock appreciation after grant dates is an indication of backdating; by chance alone, grants ought to be followed by a mixed bag of stock performance -- some rises, some declines.

To quantify how unusual a particular pattern of grants is, the Journal calculated how much each company's stock rose in the 20 trading days following each grant date. The analysis then ranked that appreciation against the stock performance in the 20 days following all other trading days of the year. It ranked all 252 or so trading days in a given year according to how much the stock rose or fell following them.

For instance, Affiliated Computer Services Inc. reported an option grant to its then-president, Jeffrey Rich, dated Oct. 8, 1998. In the succeeding 20 trading days -- equal to roughly a month -- ACS stock rose 60.2%. That huge gain was the best 20-trading-day performance all year for ACS. So the Journal ranked Oct. 8 No. 1 for

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ACS for 1998.

It is very unlikely that several grants spread over a number of years would all fall on high-ranked days.

But all six of Mr. Rich's did. Another of his option grants also fell on the No. 1-ranked day of a year, March 9, 1995. Two grants fell on the second-ranked day, those in 1996 and 1997. In 2002, his options grant was on the third-ranked day of the year, and in 2000, his grant came on the fourth-ranked day.

If a year has 252 trading days, the probability of a single options grant coming on the top-ranked day of that year would be one in 252. The chance of it coming on a day ranked No. 8 or better would be eight in 252.

The analysis then used the probability of each grant to figure how likely it is that an executive's overall multiyear grant pattern, or one more extreme than the actual pattern, occurred merely by chance. The more high-ranked days in the pattern, the longer the odds and the more likely it is that some factor other than chance influenced those dates. Two companies said they did use something other than chance -- they made grants on days when they thought the stock was temporarily low. This could explain results that differ somewhat from chance, but it wouldn't account for the extreme patterns of consistent post-grant rises.

John Emerson, an assistant professor of statistics at Yale, reviewed the methodology and developed a computer program to calculate the probabilities for all of the executives' grants except those to UnitedHealth CEO William McGuire. Because the number of his grants and complexity of his pattern made a computational method infeasible, the Journal used an estimate for his probability that Mr. Emerson said is conservative. Mr. Emerson said the figures for all six executives surpass a standard threshold statisticians use to assess the significance of a result.

For Mr. Rich's grants, the Journal's methodology puts the overall odds of a chance occurrence at about one in 300 billion -- less likely than flipping a coin 38 times and having it come up "heads" every time.

Exceedingly long odds also turned up in the Journal's analysis of grant-date patterns at several other companies. "It's very, very, very unlikely that they could have produced such patterns just by choosing random dates," said Mr. Lie.

David Yermack, an associate professor of finance at New York University, reviewed the Journal's methodology and said it was a reasonable way to identify suspicious patterns of grants. But Mr. Yermack also said the odds shouldn't be thought of as precise figures, largely because they depend on assumptions in the method used to determine which grant dates are more favorable than others.

Because nobody actually authorizing the grant on a given day could have known how the stock would do in the future, the Journal's analysis used post-grant price surges as an indication of possible backdating. Academics theorize that the most effective way to consistently capture low-price days for option grants is to wait until after a stock has risen, then backdate a grant to a day prior to that rise.

The decision to look at 20 trading days after each grant was arbitrary. But Messrs. Yermack and Lie said it was a reasonable yardstick to detect possible backdating. Using a longer period, such as a year, wouldn't be a good way to spot backdating of a few days or weeks because the longer-term trading would overwhelm any backdating effect.

The 20-day price rises don't present an immediate opportunity to profit, since options can't usually be exercised until held a year or more. But when the options do become exercisable, they'll be more valuable if they were priced when the stock was low.

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