NEW YORK -- About 1,150 options granted to chief executives at the lowest stock price of the month were the result of manipulation, according to estimates in a Harvard Law and Economics paper released yesterday.

The study looked at "lucky" grants, which it defined as grants given to chief executives at a stock's lowest price for the month. It found the grants were more likely when the payoffs from luck were high. Even for the same executives, grants were more likely to be given at the lowest point in months in which the potential payoffs from manipulation were relatively higher, the study found.

The paper, which covers the period from 1996 to 2005, studies the backdating of options. Options give the recipient a right to buy a stock at a fixed "strike price," generally set at the stock's market price the day of the grant, and options holders benefit if the stock rises above the strike price. In the backdating scandal, companies have dated option grants to days when the stock was at a low, enhancing the potential benefit.

A chief executive's chance of getting a lucky grant increased when a preceding grant was lucky, the study found.

Further findings:

About 1,000, or 43 percent, of the lucky grants were "super-lucky," having been given at the lowest price not only of the month but also of the quarter, and the authors estimate that about 62 percent of those were manipulated.

A day with the lowest price of the month was more likely to be selected as a grant date than a day with the second-lowest price even when the difference between the two prices was less than 1 percent.

Lucky grants were more likely when the company did not have a majority of independent directors on the board and the chief executive had a longer tenure, factors associated with increased influence of the chief executive on pay and board decision-making.

The study was done by Lucian Bebchuk of Harvard Law, Yaniv Grinstein of Cornell University, and Urs Peyer of the INSEAD business school in France.

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