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SOME OBSERVATIONS ON THE STOCK OPTION BACKDATING SCANDAL OF 2006

DAVID I. WALKER*

ABSTRACT

The corporate stock option backdating scandal has dominated business page headlines during the summer of 2006. The SEC is currently investigating more than seventy-five companies with respect to the timing and pricing of stock options granted during the boom years of the late 1990s and early 2000s, and the number of firms caught up in the scandal seems to increase every day. This essay contributes to our understanding of the backdating phenomenon by analyzing the economics of backdating and the characteristics of the firms under investigation. Its main points are the following: First, given the high volatilities of the stocks of the technology companies that dominate the list of firms under investigation and the fact that options granted to executives and employees typically may not be exercised for several years, press reports that focus on the size of the strike price “discounts” achieved by backdating significantly overstate the value of backdating. In some cases, reducing the strike price by a dollar per share by backdating increased the Black-Scholes value of the option by less than twenty cents per share. Second, completely unnoticed in the discussion so far is the fact that in many cases backdating dramatically reduced the apparent value of options. Because the size of executive stock option grants often is determined first by establishing the value to be delivered and then by calculating the number of shares to be covered by the option, reducing the apparent value of option shares may have substantially increased the size and true economic value of backdated executive option grants. Third, comparison of semiconductor firms under investigation for backdating with peer companies that are not suggests an association between backdating and the use of options in compensating non-executive employees. This essay considers several explanations for backdating non-executive options, including share limitations, minimizing apparent rank and file compensation, and cognitive biases. Finally, this essay argues that the backdating phenomenon is really not an accounting scandal. Backdating has accounting consequences, but it is unlikely to have been accounting driven.

* Associate Professor, Boston University School of Law. I have benefited from the helpful comments of Alan Feld, Tamar Frankel, Keith Hylton, Andrew Kull, Steve Marks, Mike Meurer, Ted Sims, and Chuck Whitehead. I thank Austin Furman for excellent research assistance.

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INTRODUCTION

Just when the business community thought it could relax following the Enron, WorldCom, and Tyco debacles, the summer of 2006 finds us embroiled in a corporate stock option backdating scandal. As of this writing, the SEC is investigating more than seventy-five companies with respect to the timing and pricing of stock options granted during the go-go years of the late 1990s and early 2000s.¹ And a recent paper suggests that this figure represents only the tip of the iceberg – that over 20% of options issued to senior executives between 1996 and 2002 may have been backdated in order to reduce option exercise prices.² By that measure, this is a much more pervasive problem than the accounting frauds orchestrated by Jeff Skilling, Bernie Ebbers, and Dennis Kozlowski.³

This essay will present a number of observations on the option backdating phenomenon. The primary aim is to contribute to our understanding of why backdating occurred by analyzing the economics of backdating and the characteristics of the firms under investigation.

At one level the backdating story is simple. Imagine that on March 15 the stock of Tech Inc. closes at \$30/share. An option on Tech granted on that date would normally have an exercise price of \$30/share. Granting the option “at-the-money” ensures that the recipient only profits if the shares appreciate in value and the shareholders profit. But imagine that the CEO of Tech looks back and notices that on February 15 the company’s stock price was only \$20/share. By falsifying the paperwork to make it appear that the company granted him an at-the-money option on February 15, when in fact the option was granted on March 15, the CEO has effectively acquired an option that is “in the money” by \$10/share.

At first blush, backdating may seem to be a simple tale of executive greed, but the story is much more complex and even more interesting than it appears on the surface. Importantly, press reports that focus on the option strike price “discount” achieved through backdating significantly overstate the effect of backdating on the value of these options.⁴ Options granted to company executives and employees typically cannot be exercised for several years, and the stock prices of the technology companies that dominate the list of firms under investigation were generally highly volatile. Given these two factors, a dollar per share reduction in the exercise price of an option may have been worth less than twenty cents per option share to the recipient.

On the other hand, unnoticed in the discussion thus far is the fact that in many cases backdating dramatically reduced the *apparent* value of options, which may have significantly increased the economic value of option grants. By apparent value, I mean the value of the stated terms of an option as calculated using an option pricing model. All else being equal, the value of an at-the-money option on a share of stock with a market

¹ See *Perfect Payday; Options Scorecard*, WALL ST. J. ONLINE, at http://online.wsj.com/page/2_1227.html (last visited Sept. 8, 2006).

² See Randall A. Heron & Erik Lie, *What Fraction of Stock Option Grants to Top Executives Have Been Backdated or Manipulated?* (working paper, Jul. 2006).

³ Former CEOs of Enron, WorldCom, and Tyco, respectively.

⁴ See, e.g., Charles Forelle & James Bandler, *The Perfect Payday; Some CEOs Reap Millions by Landing Stock Options When They Are Most Valuable; Luck – Or Something Else?*, WALL ST. J., Mar. 18, 2006, at A1 (discussing specific instances in which options apparently were backdated and the potential gains if the backdated options ultimately were exercised in the money).

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price of \$20/share is two-thirds the value of an at-the-money option on a share of stock with market price of \$30/share. This is important for backdating because the size of an executive stock option grant often is based on its value. The compensation committee first determines the value of the grant an executive will receive and then uses an option pricing model to determine the number of shares to be covered by the option. A committee that was fooled into thinking it was granting an at-the-money option at \$20/share rather than \$30/share would have increased the number of shares covered by a fixed-value grant by fifty percent.

Now we see the true economic power of backdating and why backdating may have been an excellent means of delivering stealth compensation to executives. The most important effect of backdating may have been to conceal the actual value of option shares in order to justify options on more shares. Moreover, even if this was not a deliberate strategy, the effect is the same. Fixed-value option grants that were backdated would have been much larger and more valuable as a result.

Note that I've said nothing about accounting for stock options. Press reports and government documents would lead one to conclude that companies backdated options to avoid taking an accounting hit for compensation expense.⁵ But that cannot be the whole story. Under the accounting rules in place at the time, companies could have issued at-the-money options on unlimited numbers of shares without reporting any compensation expense in their earnings statements.⁶ Moreover, I'll argue that most companies that backdated options would not have issued equivalent in-the-money options instead, even had there been no accounting or tax penalties for granting options in the money. Backdating, when discovered, has accounting consequences, but few instances of backdating were motivated by accounting concerns, and backdating does not represent an accounting scandal along the lines of those perpetrated at Enron, WorldCom, or Tyco.

However, it is likely that the story is more complicated still. Backdating was by no means limited to options granted to senior executives – options granted to rank and file employees were backdated as well. Moreover, comparison of semiconductor firms under investigation for backdating with peer companies that are not reveals that 1) “backdating” executives received a smaller fraction of company-wide option compensation than their non-backdating peers, and 2) the average employee of backdating firms received a much larger amount of option compensation than his non-backdating peers. This data suggests an association between backdating and the use of options in compensating non-executive employees.

Why might an executive backdate an option granted to a rank and file employee? To make her happy, for sure. But again, why backdate instead of simply granting an option on more shares? This essay will consider a number of possibilities including minimizing apparent rank and file compensation, avoiding share limitations, taking advantage of cognitive biases, increasing the fraction of options qualifying for employee-favorable tax treatment, and providing cover for executives to grant themselves valuable

⁵ See, e.g., SEC v. Reyes, No. C-06-4435, (N.D.CA) (complaint) [hereinafter Brocade Complaint] (alleging that executives at Brocade Communications Systems falsified paperwork to avoid recording expenses for options); Charles Forelle et al, *Brocade Ex-CEO, 2 Others Charged in Options Probe*, WALL ST. J. Jul. 21, 2006, at A1 (discussing allegations in the Brocade case).

⁶ See Financial Accounting Standards Board, Statement of Financial Accounting Standards No. 123 para. 306-316 (Oct. 1995) [hereinafter SFAS 123].

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backdated options. It will also consider whether a common advisor problem might explain the high concentration of technology firms among the companies under investigation for backdating.

Finally, this essay will offer a few brief suggestions and warnings as we deal with the current scandal and look beyond. We should begin at the beginning, however, with a brief overview of stock option practice, a discussion of the backdating scandal and its effects, and an analysis of the firms under investigation to date and how they compare to their peers, who either did not backdate or have not yet been caught.

I. BACKGROUND ON THE BACKDATING PHENOMENON

A. Stock Option Practice and Design, or, “What’s So Important About Issuing Options ‘At The Money’?”

During the 1990s, stock options became increasingly important as a method of compensating corporate executives and employees, particularly for high-tech start-up companies that were short of cash but long on potential. But even large established companies embraced options as the preferred means of compensating senior executives. On average, stock options accounted for over two-thirds of the total compensation granted to CEOs of 200 large U.S. public companies surveyed by Pearl Meyers & Partners in 2001⁷ and over half of total compensation in 2002,⁸ two years that figure prominently in the stock option backdating scandal.

Compensatory stock options provide an employee with the right to purchase shares of her employer’s stock at a predetermined exercise (or strike) price. The options issued by publicly traded companies in the U.S. tend to be extremely uniform in design. Generally, the options 1) are issued with an exercise price equal to the fair market value of the employer’s stock on the date of the grant (known as an “at-the-money” option), 2) become exercisable or “vest” over a period ranging from one to five years following the grant, 3) expire ten years after the date of the grant, and 4) are not transferable.⁹

These design features are not totally arbitrary, although their ubiquity and consistency is in some ways surprising.¹⁰ Unlike traded options that are exercisable immediately and, of course, are transferable, compensatory options vest over time in order to provide retention incentives and incentives to create long-term value. The ten year expiration is required statutorily in the case of employee tax advantaged incentive

⁷ See *Executive Pay: A Special Report*, N.Y. TIMES, Apr. 7, 2002, at R8-9.

⁸ See *Executive Pay: A Special Report*, N.Y. TIMES, Apr. 6, 2003, at R8-9.

⁹ See Kevin J. Murphy, *Executive Compensation*, in HANDBOOK OF LABOR ECONOMICS 2507-10 (Orley Ashenfelter and David Card eds., 1999). Compensatory stock options of this nature are call options, specifically American call options. A European call option is similar, but the exercise of that option must occur, if at all, on a fixed date.

¹⁰ See Lucian Arye Bebchuk et al, *Managerial Power and Rent Extraction in the Design of Executive Compensation*, 69 U. CHI. L. REV. 751, 796-824 (2002) (arguing that certain ubiquitous features of stock options are puzzling economically, including the consistency of at-the-money grants, the failure to adjust option payouts for market movements unrelated to company performance, and the formerly popular practice of lowering or “resetting” strike prices after downward moves in the market), LUCIAN BEBCHUK & JESSE FRIED, *PAY WITHOUT PERFORMANCE* (2004) (same).

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stock options that are discussed below.¹¹ However, unlike traded options, compensatory options normally are exercised well before expiration.

A combination of at best arbitrary and arguably irrational tax and accounting rules all but dictate that options not be granted in the money, i.e., with an exercise price less than the market price of the stock on the date of the grant. Not surprisingly, if in-the-money options are unavailable, at-the-money options become the option of choice. To be sure, some companies issue out-of-the money or “stretch” options, but these tend to represent a small percentage of options issued.¹²

Prior to 2005, generally accepted accounting principles (“GAAP”) provided that the only expense that had to be recognized by companies with respect to options issued on a fixed number of shares at a fixed exercise price was the difference between the exercise price and the market price of the company’s stock on the date of the grant (the option’s “intrinsic value”).¹³ An at-the-money option has no intrinsic value under this formula (although it has substantial real world value). Thus, the grant of an at-the-money option resulted in zero recognized expense for financial reporting purposes, ever. On the other hand, an option that was granted in-the-money would result in a charge to earnings. Even more complicated (and relatively more punitive) accounting rules applied to options with variable exercise prices, such as options with an exercise price indexed to the price of other securities.¹⁴ Largely because of this accounting rule (and managerial fixation on reported earnings), the grant of at-the-money options became the norm.

However, two tax rules contributed to the ubiquity of at-the-money options. IRC §§ 421 and 422 provide for special employee-favorable tax treatment for incentive stock options (“ISOs”). If all the rules are complied with, the recipient of an ISO pays taxes on her entire option profit at the lower rate of tax applicable to long term capital gains.¹⁵ One of the requirements for ISO qualification is that the strike price of the option not be less than the stock’s fair market value on the date of the grant.¹⁶ In other words, to qualify as an ISO, the option must be at- or out-of-the-money.

In addition, IRC § 162(m) limits the corporate deduction for non-performance based compensation paid to certain senior executives to \$1 million per year.¹⁷ Stock options automatically qualify as performance-based pay and result in a tax deduction, as long as certain requirements are met. Again, one requirement is that the options be granted at- or out-of-the-money.¹⁸

One would guess from the mere existence of these three rules that there is something inherently pernicious about granting an in-the-money option, but this is not really the case. Given vesting requirements, there is no guarantee that an option granted in the money today will be in the money when it becomes exercisable. The theoretically

¹¹ See IRC § 422(b)(3).

¹² See Murphy, *supra* note 9, at 2509, tbl. 5 (out-of-the-money grants comprise about 1.5% of grants in his sample).

¹³ See APB Opinion No. 25.

¹⁴ See SFAS 123, *supra* note 6, at para. 306-316.

¹⁵ See IRC § 421(a) (providing that the taxpayer shall not recognize income on the receipt of shares on the exercise of a qualifying ISO). The result of deferring income recognition on option exercise is that the entire gain on an ISO is taxed at the more favorable rates applicable to long term capital gains.

¹⁶ See IRC § 422(b)(4).

¹⁷ See IRC § 162(m).

¹⁸ See Treas. Reg. § 1.162-27(e)(2)(vi)(A).

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ideal relationship between option strike price and current market price depends on the desired level of compensation sensitivity to performance and the risk aversion of the recipient, among other factors,¹⁹ and companies can adjust the number of shares subject to an option to reflect the position of the strike price relative to market price. However, options granted in the money may appear to provide an unfair advantage, and appearances count.²⁰ In any event, through this combination of tax and accounting rules, Congress and the Financial Accounting Standards Board severely penalized the grant of in-the-money options, and few public companies have granted such options.

B. The Backdating Scandal

Well, as it turns out, many companies were granting in-the-money options; they simply weren't admitting it to their auditors, the IRS, or their shareholders. The backdating phenomenon, it now appears, involved a variety of practices, some blatantly fraudulent, others perhaps innocent, but all entail the effective grant of in-the-money options, which, when uncovered, will result in adverse tax and accounting consequences.

1. What Happened?

The classic backdating scenario was briefly outlined in the introduction. To reiterate: the compensation committee of Tech Inc. actually agrees to grant an option on 10,000 shares of its stock to its CEO on March 15, when its shares are trading at \$30. However, documentation is produced describing an at-the-money grant on February 15, when the shares were trading at \$20, and thus the option carries a strike price of \$20/share. Effectively, the company has granted the CEO an option that is \$10 in the money. Of course, the same result could have been achieved by granting the CEO an in-the-money option on March 30,²¹ but doing so would have had negative tax and accounting consequences and may have violated company restrictions on the pricing of options, which were no doubt written to ensure compliance with these tax and accounting rules.²²

In some cases backdating has been defended as necessary to level the playing field between employees hired in rapid succession. Imagine that Acme Co. has a volatile stock price; hires Andy on January 1, Beth on January 15, and Cindy on January 30; and that the market price of its stock on these three dates was \$12, \$10, and \$15/share, respectively. If Acme grants at-the-money options to its new employees on their hiring dates, Beth receives a windfall, and Andy and Cindy are displeased. Of course, Acme could grant Cindy an option with a \$10 strike price on January 30 despite the prevailing

¹⁹ See Bebchuk et al, *supra* note 10, at 818.

²⁰ Although options that are granted somewhat in the money are strongly disfavored, no one seems to object to the ultimate in-the-money option, which is known as restricted stock. Like options, restricted stock typically vests over time and is analogous to an option with zero exercise price. Of course, an executive should not expect to receive the same number of restricted stock shares as he would shares subject to an at-the-money option.

²¹ The vesting date would have to be adjusted to perfectly mirror backdating.

²² However, as I argue *infra* Part IV.B., few backdating companies would have issued in-the-money options even absent these rules, because doing so would have eliminated the stealth compensation achieved through backdating.

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\$15 market price, but that grant would result in a \$5/share charge against earnings and could not qualify as an ISO. Moreover, the expense might not be deductible for Acme if Cindy is a senior executive. Acme also might promise Andy an option with a strike price equal to the lowest market price occurring during the month of January, but that option also would have negative accounting consequences for Acme.²³ Of course, Acme also could eliminate the disparity between Andy, Beth, and Cindy by adjusting the number of shares subject to each option, but unless the number of shares is fixed on the date of the grant, compensation expense must be recognized. Thus, without perfect foresight, Acme cannot equalize compensation and preserve favorable accounting treatment, at least not without manipulation. Apparently, the solution for some companies was backdating. In this example, Acme would generate paperwork indicating that each employee received an at-the-money option grant on January 15 with a strike price of \$10/share. For Cindy, this might mean generating a bogus offer letter dated two weeks prior. For Andy, the company could simply report that his option was granted subsequent to hiring.

Microsoft and Micrel Inc. have admitted to utilizing an option pricing practice that is a variant of the foregoing.²⁴ Both companies set strike prices at the lowest closing price during the thirty days following approval to make the grant. Of course, this technique is the same as granting an option thirty days hence based on the lowest closing price registered over the previous thirty days. Moreover, unless the lowest stock price occurred on the last day of the period, these options were technically issued in the money, since the exercise price would have been less than the market price on the date on which the exercise price was actually determined, i.e., at the end of the thirty day period. Micrel, which has sued Deloitte & Touche for allegedly signing off on this arrangement, has stated that one of its goals was to level the playing field among employees hired in rapid succession.²⁵ Microsoft ended this practice in 1999 after having utilized it for seven years.²⁶ As these two examples demonstrate, backdating was not limited to option grants to senior executives.

2. Evidence of Backdating

The evidence of pervasive backdating is overwhelming. In many cases a review of daily pricing data reveals that the exercise prices of options granted to executives were consistently set equal to a company's lowest market price for the month, the quarter, or even the year.²⁷ The odds of grants consistently being made on periodic lows without hindsight are minuscule.²⁸ David Yermack first pointed out anomalies in executive stock option pricing in a 1997 article titled, "Good Timing: CEO Stock Option Awards and

²³ See SFAS 123, *supra* note 6.

²⁴ See Charles Forelle & James Bandler, *During 1990s, Microsoft Practiced Variations of Options Backdating*, WALL ST. J., Jun. 16, 2006, at A1; David Reilly, *Moving the Market: Micrel Says Deloitte Approved Options-Pricing Plan*, WALL ST. J., Jun. 1, 2006, at C3; Eric Dash, *Inquiry into Stock Option Pricing Casts a Wide Net*, N.Y. TIMES, Jun. 19, 2006.

²⁵ See Reilly, *supra* note 24; Dash, *supra* note 24.

²⁶ See Forelle & Bandler, *supra* note 24.

²⁷ See Forelle & Bandler, *supra* note 4.

²⁸ See *id.* (reporting odds of certain option pricing patterns occurring by chance at Affiliated Computer Services as one in 300 billion; at UnitedHealth Group as one in 200 million; at Brooks Automation as one in 9 million; and at Vitesse Semiconductor as one in 26 billion).

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Company News Announcements.”²⁹ Yermack found that company stock prices tended to rise following option grants, a fact he attributed to opportunistic grant timing, something akin to insider trading. He did not imagine that the story was even simpler, that prices rose after many option grants because the grant dates were selected with hindsight.³⁰ This discovery was made by Erik Lie, who studied stock price movements around a much larger sample of option grants and concluded that unless executives were extraordinary prognosticators, some of the options were being backdated.³¹

Lie and a colleague, Randall Heron, have followed up with two further studies. One took advantage of the change in option reporting requirements that occurred in August, 2002.³² Prior to that date, option grants received by senior executives were not required to be reported to the SEC until forty-five days after the end of the company’s fiscal year. Now, as a result of the Sarbanes-Oxley Act, the SEC requires options issued to executives to be reported within two business days of the receipt of the grant.³³ Because a two-day window provides little scope for backdating, Lie and Heron predicted that the abnormal pricing patterns around option grants would be severely curtailed after August, 2002. This proved to be true, supporting the idea that backdating, rather than amazing forecasting abilities, explained the earlier findings.³⁴

A second Heron and Lie study attempts to quantify the extent of the backdating phenomenon.³⁵ This study estimates that 16% of purported at-the-money options granted to senior executives between 1996 and 2005 were backdated or otherwise manipulated.³⁶

The Wall Street Journal has been very active in investigating this phenomenon as well. The Journal followed up on Lie’s initial study, interviewing executives at companies whose option grants were followed by large gains in share price.³⁷ Moreover, on its website, the Journal has kept a running tally of companies under investigation by the SEC or the Justice Department.³⁸

As of this writing, at least seventy-five public companies are under some sort of investigation relating to stock option pricing,³⁹ civil charges have been filed against executives of Brocade Communications Systems,⁴⁰ and both criminal and civil charges have been filed against executives of Converse Technology.⁴¹ Thus far, over forty firms

²⁹ 52 J. FIN. 449 (1997).

³⁰ See Steve Stecklow, *Options Study Becomes Required Reading*, WALL ST. J., May 30, 2006, at B1 (quoting Yermack as saying that he initially didn’t believe the backdating explanation, because the “whole idea was so sinister”).

³¹ See Erik Lie, *On the Timing of CEO Stock Option Awards*, 51 MGMT. SCI. 802 (2005).

³² See Randall A. Heron & Erik Lie, *Does Backdating Explain the Stock Price Pattern Around Executive Stock Option Grants?*, XX J. FIN. ECON. XX (2006).

³³ See Securities Exchange Act of 1934 § 16(a)(2)(C).

³⁴ See Heron & Lie, *supra* note 32.

³⁵ See Heron & Lie, *supra* note 2.

³⁶ See *id.* The authors find further that 18.9% of unscheduled grants (i.e., grants not made on a certain date each year) were backdated or manipulated and that 23% of unscheduled at-the-money grants were backdated or manipulated in the period prior to the effectiveness of the two-day filing requirement.

³⁷ See Forelle & Bandler, *supra* note 24.

³⁸ See *Perfect Payday*, *supra* note 1.

³⁹ See *id.*

⁴⁰ See Charles Forelle et al, *Brocade Ex-CEO, 2 Others Charged in Options Probe*, WALL ST. J. Jul. 21, 2006, at A1.

⁴¹ See Charles Forelle & James Bandler, *Stock-Options Criminal Charge: Slush Fund and Fake Employees*, WALL ST. J., Aug. 10, 2006, at A1.

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have restated their financials to properly account for backdated option grants.⁴² Executives at nine firms have resigned in the wake of the scandals.⁴³

Heron and Lie's findings suggest that the current investigations represent only the tip of the iceberg, but the list of companies under investigation to date is interesting in several respects. Most notably, a very high percentage of the firms under investigation are technology companies. By my count, over 80% of the companies currently under SEC investigation are technology firms. Of course, option compensation is particularly widespread at technology companies, but the sector seems to be disproportionately represented in the pool of implicated companies even taking their high reliance on options into account.

3. Tax and Accounting Consequences of Backdating

The potential tax and accounting consequences of revealed option backdating are illustrated by the SEC's complaint filed against executives of Brocade Communications Systems. The complaint alleges, inter alia, that Brocade granted options on two million shares of its stock on October 30, 2001, when in fact the grants were not approved until January of 2002.⁴⁴ Brocade's average stock price for January, 2002 was \$36.56. The price on October 30, 2001, was \$24.20. Backdating these options to October reduced the strike prices by about one-third.

In effect, the SEC alleges that Brocade issued options with a \$24.20 strike price when the market price was \$36.56 (using the January average). The tax and accounting effects of issuing such deeply in-the-money options are threefold. First, consistent with its earlier position that all options were granted at the money, Brocade had reported zero compensation expense for these options. Brocade will now be required to report an expense in excess of \$20 million.⁴⁵ Second, any of these options that purportedly qualified for ISO treatment in fact do not. As a result, recipients who complied with the ISO holding period requirements and paid taxes on their gains at capital gains rates will owe the government additional taxes representing the difference between ordinary income tax rates and capital gains rates on the profit achieved at the time of exercise. On the other hand, Brocade now will be entitled to a tax deduction for compensation paid in an amount equal to the ordinary income reported by its employees.⁴⁶ Third, to the extent that senior executives received any of these options, the associated expense will not be deductible for Brocade under the performance-based pay exception to the limitations of § 162(m).

⁴² See *Perfect Payday*, *supra* note 1 (as of 9/8/06).

⁴³ See *id.*

⁴⁴ See Brocade Complaint, *supra* note 5, at 12.

⁴⁵ Under the accounting rules in force at the time, the compensation expense reported for an option on a fixed number of shares at a fixed price is equal to the number of shares subject to the option multiplied by the difference between the exercise price and fair market value of the stock on the date of the grant, here two million shares times about \$12/share, which equals \$24 million. See APB Opinion No. 25, *supra* note 13.

⁴⁶ Depending on Brocade's tax status, this may be an advantageous trade off, and, of course, Brocade may reimburse its employees for the additional taxes they incur as a result of ISO disqualification. See David I. Walker, *Is Equity Compensation Tax Advantaged?*, 84 B.U. L. REV. 695 (2004).

C. Some Preliminary Empirical Observations

Given the rapidly unfolding nature of this scandal, any empirical observations made today are necessarily preliminary, but comparing identified backdaters to their peers is a crucial component of understanding the phenomenon. Four observations are noteworthy. First, technology companies appear to be disproportionately represented among firms implicated. Second, within the semiconductor sector, at least, senior executives of firms under investigation received a smaller fraction of options granted, but more total value in option grants, than those of peer companies that are not under investigation for backdating. Third, options use ran more broadly or deeply at backdating firms within the semiconductor industry than at non-backdating peer firms: The total value of options granted company wide was substantially larger at backdating firms, even after adjusting for employment. Fourth, with the exception of the previous point, backdating and non-backdating firms within the semiconductor industry are not noticeably different.

1. A Technology Sector Phenomenon?

By my count over 80% of the firms currently under investigation for backdating options are properly labeled as technology companies, but the boundaries of this category are fuzzy. I include several firms that do not fall within the classic Standard Industrial Classification (“SIC”) technology categories. For example, I include Monster Worldwide (parent of monster.com), which is classified as an advertising company, and Apollo Group (parent of the University of Phoenix on-line education system), which is classified as an educational services firm. Strikingly, however, almost 40% of the seventy-seven companies under investigation by the SEC as of September 8 fall within just two 4-digit SIC technology codes: 3674, semiconductors and related devices, and 7372, prepackaged software.⁴⁷

It is too soon to know whether this is disproportionately a technology sector scandal. Joseph Grundfest has suggested that tech firms may have been singled out prematurely; that the large number of tech firms under investigation may simply reflect the heavy reliance on option compensation in the tech sector.⁴⁸ On the other hand, there is anecdotal evidence suggesting that backdating was even more pervasive within the technology sector than the list of firms currently under investigation would suggest. One Silicon Valley lawyer reportedly stated that he’d be surprised if any publicly traded technology firms were not involved in backdating during the boom years.⁴⁹

2. Distribution of Options and Option Value Within Backdating Firms

Although we do not yet know the full extent of the backdating phenomenon, it may be useful to compare identified backdaters with their non- (or not yet identified-)

⁴⁷ A list of firms under SEC investigation for backdating as of September 8, 2006, and their SIC codes is included as Appendix A.

⁴⁸ See Gary Rivlin & Eric Dash, *Silicon Valley Firms Scrutinized on Stock Option Policies*, N.Y. TIMES, Jul. 22, 2006.

⁴⁹ See Heron & Lie, *supra* note 32, at 10 (citing anonymous source).

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backdating peers. The concentration of backdaters in SIC code 3674 provides a prime opportunity. I compared five year's of data (1998-2002) for seventeen firms in this classification that are under investigation with corresponding data on a sample of thirty firms that currently are not. My analysis focused on option grants to senior executives under the assumption that if backdating was driven by executive greed, one would expect to find the evidence in this data. It was also sparked by a recent study by Jack Ciesielski, editor of the Analyst's Accounting Observer, and reported in the New York Times, finding that 57% of the companies under investigation for backdating as of June 30, 2006, granted considerably more options to their senior executives than their peers.⁵⁰

My findings were just the opposite: Within SIC code 3674, at least, option grants were *less* "top heavy" at firms under investigation. On average 13.8% of the shares covered by options granted by backdating firms each year went to the top five senior executives. The corresponding figure for firms not under investigation was 18.7%.⁵¹ However, the options granted to the senior executives of backdating firms were much more valuable than the options granted to their peers. Over this period, the top five executives of backdating firms received option grants with Black-Scholes values averaging about \$16.3 million per year (\$17.6 million median) in total, while their peers received grants with average value of \$10.0 million per year (\$5.8 million median).⁵²

It appears from these figures that the executives of the backdating firms received smaller slices of larger options pies. Even after controlling for firm size, executives of backdating firms appear to have received more valuable option grants than their peers at non-backdating firms.⁵³

Interestingly, backdating itself does not help explain this data. As we will see, backdating increases the actual value of options, but decreases their reported value.⁵⁴ Thus, the \$16.3 million average annual grant value for the senior executive group of backdating firms probably understates the true value of the options received and the gap versus their non-backdating peers. Moreover, the evidence suggests that backdating was by no means limited to executive stock options. If options were backdated throughout the ranks, the effect of backdating cannot account for the lower percentage but higher reported value of options received by the executives of implicated firms.

Rather, it appears that backdating firms relied much more heavily on option compensation throughout the ranks than their peers. Assuming that executive and non-executive stock options granted by backdaters were equally valuable *per share*, the average employee of the average backdating firm received almost three times the option compensation of her peers at non-backdating firms.⁵⁵

⁵⁰ See Gretchen Morgenson, *At the Options Buffet, Some Got a Bigger Helping*, N.Y. TIMES, Jul. 23, 2006, (citing Ciesielski's report).

⁵¹ This difference was statistically significant at the 5% level. See Appendix C.

⁵² This difference was not statistically significant. See Appendix C.

⁵³ The Black-Scholes value of options granted to the top five executives of backdating companies averaged 4.72% of annual company revenues; for the control group, the average was 3.07%. See Appendix C.

⁵⁴ See *infra* Part II.A & C.

⁵⁵ See Appendix C. Backdating companies were estimated to have provided options worth about \$125,000 per employee per year during the period. The comparable figure for the control group was \$42,500. This difference was statistically significant at the 1% level. Given the uniformity of option grants, one would not expect any bias in the per share value of at-the-money options granted to executives and the rank and file. If executive stock options were more frequently or significantly backdated than

3. Other Differences Between Firms Under Investigation and Their Peers

Other potential differences between backdaters and their peers were statistically insignificant and less interesting directionally. Backdating firms are smaller in terms of revenue than their peers, but the difference is chiefly the result of two very large firms that ultimately were eliminated from the control group, Intel and Texas Instruments. Growth in employment between 1998 and 2000, which one might think would contribute to pressure to backdate, was about the same between the two groups as was volatility. Corporate governance quality, as measured by Bebchuk, Cohen, and Ferrell's entrenchment index was slightly better for backdating firms.⁵⁶

II. THE ECONOMICS OF BACKDATING

How valuable was backdating for the recipients of options? This interesting question has received almost no attention in the media. Perhaps because option valuation is complex, reports have focused either on the strike price "discounts" achieved through backdating or on the size of the earnings restatements required once backdating was discovered. However, those figures are only loosely connected with the value of backdating to optionees.

There are at least three reasons to consider carefully the relationship between backdating and option value. First, it is possible that value per se was relatively unimportant, that executives and other recipients of backdated options thought of strike price discounts as a free lunch or focused solely on the discounts as a result of naïveté or cognitive biases, but there was much at stake in backdating as numerous resignations demonstrate. Before we accept naïveté or cognitive biases as an explanation, it makes sense to determine the extent to which real economic value was transferred via backdating. Second, thorough understanding of the economics of backdating may help us understand why certain firms engaged in the practice and others did not. For example, Heron and Lie argue that executives of firms with more volatile stock prices had more incentive and were more likely to backdate than their peers at firms with less volatile stocks.⁵⁷ Finally, as litigation over backdating mounts, it is helpful to understand how much the actors actually gained as a result.

Careful analysis reveals that backdating generally resulted in the transfer of only modest economic value unless it affected the size of option grants. Contrary to the apparent assumption of most reports, reducing the strike price of an option by a dollar per share does not increase the value of the option by a dollar per share, but by small fraction of that amount. Thus, if the size of option grants is fixed based on the *number* of shares covered by the option, the value of backdating to the optionee is much less than one

options granted to the rank and file, the reported value of executive options would be lower per share, and the difference between the value of grants to the rank and file of backdaters versus their non-backdating peers would be even greater. Unfortunately, the value of company-wide grants can only be estimated. Only the value of options granted to senior executives is publicly available.

⁵⁶ The entrenchment index is based on six provisions that are a subset of twenty-four governance provisions tracked by the Investor Responsibility Research Center. Bebchuk, Cohen, and Ferrell found that this subset of provisions best correlated with firm value and shareholder returns. See Lucian Bebchuk et al, *What Matters in Corporate Governance?* (working paper, Mar. 2005).

⁵⁷ See Heron & Lie, *supra* note 2, at 3.

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would imagine. However, backdating has a second effect. In addition to marginally increasing the value of an option on a given number of shares, backdating significantly reduces the *apparent value* of the option as calculated with the Black-Scholes model or another option pricing model. Thus, if the size of a grant is based on the calculated Black-Scholes value of the option (as executive stock options often are), backdating results in a larger and much more valuable grant of options. As we will see, this analysis explains why backdating was in fact an excellent form of stealth compensation and it may explain why companies with high stock price volatility are more likely to have backdated options, despite the fact that increased volatility dampens the per share effect of discounting an option's strike price.

A. Backdating Benefit Per Share is a Small Fraction of Strike Price “Discount”

In order to understand the intuition behind the assertion that reducing the strike price of an unvested option does not increase its value dollar for dollar, consider the Brocade Communications example discussed above. Brocade effectively reduced option strike prices from about \$36 to \$24/share. To be sure, if the options ultimately were exercised at a time when Brocade's market price exceeded \$36/share, the ex post value of backdating would be \$12/share. But if the options expired out-of-the-money, despite the strike price reduction, backdating accomplished nothing ex post. Since the options were not immediately exercisable, this scenario was a real possibility, and in fact, seems likely to be the ultimate outcome for Brocade's optionees, although no one could have known this in January of 2002.⁵⁸ A final possibility is that the backdated options would be exercised when the stock price was between \$24 and \$36/share, resulting in ex post backdating value between \$0 and \$12/share.

It is clear from this example that the ex ante value of backdating was less than the strike price discount. We can employ the Black-Scholes option pricing model to determine how much less. This model was developed to value market-traded options, and its use with compensatory options is controversial.⁵⁹ Because compensatory options cannot be transferred and are not immediately exercisable (unlike traded options), the Black-Scholes model overstates the value of these options.⁶⁰ However, with a small tweak to the model to account for non-transferability, the model should be sufficient for purposes of estimating the incremental impact of backdating on option value.

The inputs to the Black-Scholes model are the current stock price, the option exercise price, the time to option expiration, the stock's volatility, and the risk-free interest rate. The model is particularly sensitive to volatility and duration.⁶¹ This makes intuitive sense if one thinks about the Brocade example. Options will either be exercised in the money and will be valuable ex post or they will expire out of the money and have zero value. The expected value is not symmetric. No matter how far out of the money the option is on expiration, the option never has negative value. Thus, an option on a

⁵⁸ Brocade's options dated October 30, 2001 would not have become exercisable prior to October 30, 2002. Brocade's stock has not closed above \$24/share since May 14, 2002. The stock closed at \$6.14/share on September 7, 2006.

⁵⁹ See Murphy, *supra* note 9, at 2511-13.

⁶⁰ See *id.*

⁶¹ See RICHARD A. BREALEY & STEWART C. MYERS, PRINCIPLES OF CORPORATE FINANCE 572 (5th ed., 1996).

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highly volatile stock that is likely to see great highs (high value ex post) and great lows (zero value ex post) is more valuable than an option on a low volatility stock that is likely to produce modest highs (modest value ex post) and modest lows (still zero value ex post). Moreover, the longer the optionee has to act, the greater the chance of the option being well in the money and the greater the option's expected value.

Let's return to the concrete Brocade example. The company's share price averaged \$36.56 during January 2002. The stock was highly volatile in 2001 and 2002. The expected volatility reported by the company for options issued in fiscal years 2001 and 2002 averaged 112%.⁶² Using this volatility figure, a 3% risk free interest rate, and assuming, as is typically the case, that the Brocade options expired in ten years, the value of an at-the-money option at \$35.56/share is computed to be about \$34/share.⁶³

However, the value just calculated is actually that of a "European option," that is, an option that is exercisable only on the exact date ten years hence. Once vested, an American option is exercisable at any point prior to expiration. For traded options, this difference is unimportant, since option theory says and experience confirms that traded options should not be exercised until the last possible moment.⁶⁴ The reason for this is that traded options always have option value in excess of their intrinsic value, so the holder can always sell the option for more than she would receive on exercise, permitting the buyer to take advantage of the continuing option life. Compensatory options clearly are different. Since they cannot be sold, optionees often exercise well before expiration, giving up some option value. However, we can adjust for this difference by inputting a shorter period to expiration into the model, and in fact this is what companies routinely do when they value compensatory options.

Brocade's 2002 annual report states that the expected life of their options was only a half year after vesting.⁶⁵ Their option plan documents suggest that the typical Brocade option vested between one and four years after grant.⁶⁶ If we think about these as being many little option grants, the average grant vested about 2.5 years following issuance. If we adopt Brocade's view that the expected life was only a half year more, we should use three years from grant for option exercise. Rerunning the Black-Scholes model using a three year life instead of a ten year life reduces the value from \$34/share to \$24.96/share. The nine dollar reduction in value confirms the point made earlier that increasing the time to exercise an option increases the option's value.⁶⁷

⁶² The volatility figures used throughout this essay refer to the standard deviation of continuously compounded returns, expressed as an annual percentage. Brocade reported average expected volatility for options granted during the fiscal year ending on October 27, 2001 of 127.4%; for the year ending on October 26, 2002, 97.1%. See Brocade Communications Systems Inc., 2002 Annual Report (Form 10-K), filed Jan. 22, 2003, at 56.

⁶³ All Black-Scholes values reported in this essay were determined using an on-line calculator available at <http://www.option-price.com/>.

⁶⁴ See BREALEY & MYERS, *supra* note 61, at 605. The presence of dividends complicates this analysis. I assume throughout that there are no dividends. This is a reasonable assumption for young technology stocks.

⁶⁵ See Brocade Communications Systems, Inc., Form 10-K, filed Jan. 22, 2003, at 56.

⁶⁶ See Brocade Communications Systems, Inc., Exhibit. 4.1 to Form S-8, filed Aug. 13, 1999.

⁶⁷ Why then would Brocade report that it expected options to be exercised soon after vesting? There are many reasons that compensatory options are not held until exercise. Employees cannot sell the options, so if options represent the bulk of their compensation and they need cash, they're forced to exercise. In addition, employees typically are overexposed to their employer's stock. Even if they do not

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Under these revised assumptions, an at-the-money compensatory option issued on Brocade's stock at the January 2002 average market price of \$36.56 would have been worth about \$24.96/share. How did reducing the strike price by \$12/share to \$24.20 affect this value? Based on 112% volatility, a three year average expected life, and a 3% interest rate, the value increases to \$27.28/share. The increase in expected value is only \$2.32/share, or less than twenty cents for each dollar reduction in strike price. Put another way, a 34% reduction in the strike price of these Brocade options increased the expected value of the options by only 9%. Moreover, in making various assumptions I've guarded against *understating* the impact of backdating. For example, if one uses the contractual ten year life of the options instead of the three year expected life, the value boost from backdating these options falls to 1%.⁶⁸

Admittedly, the Brocade example is somewhat extreme. Brocade's stock during this period was highly volatile even by the standards of the tech industry. But the three year expected option life reported by the company is extreme as well, and as we'll see in the next section, these two factors tend to offset one another. More typical figures for a tech stock during this period might have been 80% expected volatility and four year expected option life. Even under these assumptions, a dollar reduction in strike price increases option value by less than twenty-five cents per option share.⁶⁹

B. Increased Stock Price Volatility Reduces the Value Boost from Backdating

Heron and Lie theorize that high volatility increases the potential gains from backdating, and their research finds a relationship between the degree of stock price volatility and frequency of backdating.⁷⁰ This result is surprising if option grants are based on a fixed number of shares. Volatility has three interrelated effects that when aggregated appear to reduce the per share benefit of backdating.

Heron and Lie apparently have in mind the impact of volatility on the strike price "discount" that can be achieved by looking back over a month or quarter to pick a purported grant date for an option. To be sure, greater volatility increases the expected discount, and the longer the look-back period, the greater the effect of volatility on the expected discount.

On the other hand, higher volatility dampens the expected value boost that can be achieved by discounting an option's strike price. For example, if we rerun the Brocade numbers but assume 60% volatility instead of 112%, the expected gain from backdating

need the cash, it may be too risky for them to hold compensatory options until expiration. See J. Carr Bettis et al, *The Cost of Employee Stock Options* (working paper, Mar. 2003).

⁶⁸ Even readers who are well versed in option valuation may be surprised by the minimal impact of the strike price reduction on option value in this example. It is difficult to explain the intuition, but the outcome is a function of the riskiness of options on the highly volatile Brocade stock.

⁶⁹ For example, assuming 80% volatility, four year life, and a 3% risk free interest rate, the Black-Scholes value of an at-the-money option on a stock trading at \$100/share is \$60.15/share. Reducing the strike price by \$10/share or 10%, increases the Black-Scholes value to \$62.31/share. The increase is \$2.16 or about twenty-two cents for each dollar of strike price reduction. The average volatility of the backdating and control groups of companies classified under SIC code 3674 and listed in Appendix B over the 1998 to 2002 period was slightly in excess of 80%.

⁷⁰ See Heron and Lie, *supra* note 2, at 3, 14-15.

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increases from \$2.32/share (9%) to \$4.54/share (18%).⁷¹ Why does higher volatility dampen the value boost from backdating? Simply this, a “head start” given on a non-volatile option is more likely to persist until vesting and exercise than an equal head start given on a volatile option.⁷²

Finally, we must take into account the effect of volatility on expected life. Research indicates that the expected life of compensatory options varies inversely with volatility.⁷³ This is not surprising. Employees whose compensation is chiefly comprised of options bear a great deal of firm-specific risk. The more volatile the stock of their employer, the greater the risk. All else being equal, we should expect holders of compensatory options on highly volatile stocks to exercise relatively soon following vesting.⁷⁴ Because the benefit of backdating is dampened over time, early exercise tends to preserve the discount. Thus, if options on highly volatile stocks are more likely to be exercised early, this factor increases the backdating boost associated with more volatile stocks.

How do these three factors balance? It is difficult to say as a theoretical matter, since the effect of volatility on expected option life depends on the risk exposure and tolerance of option recipients. However, a rough and dirty analysis utilizing actual pricing data suggests that high volatility may reduce the relative per share benefit of backdating.

My analysis of the impact of volatility on the value of backdating is based on an option pricing approach that Microsoft has admitted to using during the mid-1990s. During this period, Microsoft routinely granted options with strike prices equal to the low closing price for the month.⁷⁵ I replicated that approach for twenty-four consecutive months (2001 and 2002) using daily pricing data for IBM, Intel, and Analog Devices. I chose these three companies because of marked differences in stock volatility. Average annualized stock volatilities for the sixty months prior to each of these two years for these companies were as follows: IBM: 34 & 40%; Intel: 54 & 59%, and Analog Devices: 70 & 74%.⁷⁶ In each case, I compared the value of an option granted at the monthly average closing price with an option granted at the monthly low. Using actual data allowed me to

⁷¹ While informative, this example is unrealistic in that it continues to assume a three year average option life despite the reduction in volatility. This point is picked up in the following paragraph.

⁷² Consider the Brocade example. If the stock had zero volatility, the stock would always trade at \$36.56/share. The recipient of an option with a strike price of \$24.20 would be assured of collecting the \$12.36 difference on exercise. As the volatility increases, the certainty of collecting the discount fades.

⁷³ See Bettis et al, *supra* note 67, at 16 & tbl. 3 (finding with respect to a sample of 100,000 option exercises at over 3000 companies that employees in companies in the highest quintile of stock price volatility exercised options over a year earlier on average than employees of companies in the lowest volatility quintile).

⁷⁴ See *id.* at 12. A quick glance at a handful of proxy statements supports this intuition and the evidence of Bettis and his colleagues. As noted, Brocade estimated the expected life of its options on its highly volatile stock to be only six months beyond vesting. In their most recent annual reports, Microsoft estimated an expected life of its options granted in 2004 to be seven years and expected volatility of 30%. Falling in between these two examples, Vitesse Semiconductor reported expected life of 2004 option grants of five years and expected volatility of 75%.

⁷⁵ See Forelle & Bandler, *supra* note 24.

⁷⁶ Historic volatility data is from Standard and Poor's Compustat database, available to subscribers at <http://wrds.wharton.upenn.edu/ds/comp/index.shtml>. Actual volatilities during the periods at issue were comparable.

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see the impact of increased volatility on both the strike price “discount” resulting from backdating and the expected value boost achieved.

My first set of calculations was based on the additional assumption of a six year expected life for all of the options. Intel estimated a six year life for the options it granted during this period, and the figure roughly corresponds with average industry experience.⁷⁷ Based on these assumptions, the benefit of backdating the IBM options averaged 6.95%, ranging from a monthly low of 1.82% to a high of 16.89%. The average difference between IBM’s monthly average and monthly low stock price during these two years was 7.96% (ranging from 1.88% to 18.46%). Thus, for the relatively low volatility IBM stock, the benefit of backdating was only slightly less on a percentage basis than the strike price discount achievable using the Microsoft approach.

The Intel stock was more volatile, so it should be no surprise that this backdating approach yielded larger strike price discounts, and indeed this was the case. The discount averaged 10.54% (ranging from 4.53% to 18.18%). However, because of the dampening effect of volatility, the expected benefit from backdating the Intel options averaged only 4.54% (ranging from 1.48% to 8.65%).

This pattern continued with Analog Devices. The monthly strike price discount resulting from this backdating approach averaged 12.5% (ranging from 6.54% to 22.76%), but the expected benefit from backdating averaged only 3.61% (ranging from 1.71% to 7.38%).

Admittedly, this is a rough estimation of the effect of volatility on backdating benefit, but the result is striking. Excluding the effect of volatility on expected life, the larger strike price discount that can be expected when backdating an option on a highly volatile stock is more than offset by the dampening effect on Black-Scholes value. In this example, the benefit of backdating the low volatility IBM option was almost twice that of backdating the Analog Devices option.

Factoring in the effect of expected life on backdating benefit narrows the gap between the options in my example, but does not eliminate it. Analog Devices reported an estimated expected life for its options granted in 2001 and 2002 of 5.3 and 5.2 years, respectively. Rerunning the Analog Devices calculations using a five year expected life instead of a six year life increases the average expected backdating benefit from 3.61% to 4.13%.

For this selected sample of companies, at least, the primary effect of high stock price volatility is to dampen the expected per share value boost that is associated with discounting an option’s strike price. This effect more than offsets the effect of volatility on the expected strike price discount and on the expected life of the option. Thus, whether a company is looking back over a quarter, a month, or a week,⁷⁸ backdating

⁷⁷ See Jennifer N. Carpenter, *The Exercise and Valuation of Executive Stock Options*, 48 J. FIN. ECON. 127, 138 (analyzing option exercises at 40 firms from 1979 to 1994 and finding that option exercise followed grant by 5.8 years on average (6.1 years median)); Bettis et al, *supra* note 67, at 48, tbl 2 (finding for their large sample the number of years between option vesting and exercise averaged 2.4 (1.8 years median)). If options vest on average between one and five years following grant, these figures are roughly comparable, but they may reflect shorter average holding periods during the late 1990s when Bettis and his colleagues collected their data.

⁷⁸ Backdating at Brocade Communications allegedly ranged between a quarter and a week. See Brocade Complaint, *supra* note 5, at 6, 7. Although one might think that higher volatility would be increasingly beneficial for backdating as the look-back period increases (because of the steeper discounts

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apparently holds less promise for employees or executives who receive options on a fixed number of shares of highly volatile stocks. Based on the analysis thus far, Heron and Lie's finding that backdating was more prevalent among firms with more volatile stocks seems surprising.

C. Backdating is Highly Valuable if Size of Option Grant is Based on Option Value

The analysis thus far does not suggest that backdating was a highly profitable activity. Reducing the strike price of an option on 100,000 shares by 30% through backdating does not deliver anything close to 30% additional value to the optionee, and the value delivered decreases as stock volatility increases. But we should ask ourselves where the 100,000 share figure came from. Why an option on 100,000 shares, versus 50,000, versus 200,000? If, in fact, an executive is really being awarded \$1 million worth of option compensation which works out to be an option on a certain number of shares, backdating becomes highly valuable and volatility becomes the backdater's friend, because backdating reduces the *apparent* value of an option grant.

Let's return to the Brocade example. Assuming an average 112% volatility and three year expected life, we calculated that the value of an option with a \$24.20 strike price on stock actually worth \$36.56 per share was \$27.28/share, versus the \$24.96/share value of an at-the-money option at \$36.56, a modest value boost. However, the company purported to grant the executives an at-the-money option on a date on which the share price was \$24.20. The value of that fictitious option would have been only \$16.52/share, and this is the figure that the company would have reported to its shareholders.⁷⁹

Suppose that as a result of competitive benchmarking or simply negotiation, Brocade's compensation committee determined that its CEO should receive an option grant with Black-Scholes value of \$1 million and that the time is mid-January, when the current market price of the company's shares is \$36.56. The CEO should receive an at-the-money option on 40,064 shares (\$1 million / \$24.96/share). Instead the option is backdated and has a purported value of \$16.52/share. A \$1 million grant now requires an option on 60,533 shares, a fifty percent increase. But wait, there's more. The actual value of the backdated in-the-money option is \$27.28/share. Thus, the total value of the grant increases from \$1 million to \$1.65 million. Reducing the strike price by 34%

available), that does not seem to be the case, at least with respect to these three companies investigated over the 2001 to 2002 period. Repeating the analysis discussed above, but comparing quarterly low closing prices to quarterly averages, results in a rough doubling of all of the figures reported. For IBM, the average difference between quarterly lows and quarterly average prices was 17.54%. The average benefit to backdating looking back over the quarter was 16.11%, assuming six year average option life (13.84% assuming seven year average life). For Analog Devices, the average discount was over 24%, but the average backdating benefit only increased to about 7.57%, assuming six year average option life (8.92% assuming five year average life).

⁷⁹ All else being equal, i.e., volatility, expected life, and the risk free interest rate, the Black-Scholes value of an at-the-money option is proportional to the market price of the underlying shares. Volatility is expressed in percentage terms. Variations of an equal percentage around a greater and lesser mean will produce proportionally greater deviations and greater potential option gains for the higher priced stock. See ZVI BODIE ET AL, INVESTMENTS 709 (5th ed. 2002) (providing the Black-Scholes formula and explaining its intuitions).

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through backdating increased the value of a fixed-value option grant in this case by 65%.⁸⁰

Now we see the true power of backdating. If the current market price and strike price had been transparent, if it were obvious, in other words, that the company was issuing in-the-money options, recipients whose grants were value based would have received no benefit at all.⁸¹ The number of shares subject to grant would have been reduced to reflect the actual Black-Scholes value. The most important effect of backdating may have been to conceal the value of option grants.

How does volatility factor into this equation? As we've seen, increased volatility increases the strike price discount that can be achieved through backdating. For a grant on a fixed number of shares, this benefit is more than offset by the dampening effect of volatility on the value boost from the discount. However, for the recipient of a fixed value grant, the deeper discount achievable on higher volatility stock also results in an option grant with a very low purported value per share, which boosts the value of the option. If the IBM, Intel, and Analog Devices stock price data for 2001 and 2002 is representative, the net effect of volatility on the benefit of backdating fixed value option grants is positive. Factoring in the effect of volatility on expected life, backdating the IBM options resulted in an average benefit of 15.3%; backdating options on the more volatile Analog Devices stock boosted their value by 18.7% on average. The difference is not large and it's unlikely to be statistically significant, but it agrees directionally with Heron and Lie's finding that the incidence of backdating was correlated with stock price volatility.⁸²

D. Are the Sizes of Option Grants Based on Value or Share Numbers?

This analysis would be very neat if we knew exactly how each firm determines the size of its option grants. We don't. Companies are not required to disclose the method by which they arrived at specific grants, and the disclosure of overall executive compensation philosophy that is required in the proxy statement is apparently satisfied through generalities. Nonetheless, anecdotal and survey evidence suggest that many, if not most, executive stock option grants are value based and thus would increase both in size and value as a result of backdating.

Executives generally receive stock options under multi-year plans. Option value plays a role in all of these plans, but in a fixed-share plan, the company establishes at the outset the number of option shares to be granted to each executive for the next several years.⁸³ The share figures need not be constant, but the Black-Scholes value of a specific

⁸⁰ The gain resulting from backdating value-based grants is clearly a function of the strike price discount achieved. Otherwise, the result does not particularly depend on the specific Brocade data. A one-third reduction in strike price on a fixed value grant of options on a stock with 80% volatility and four year life (typical for semiconductor firms during this period) increases option value by 71%.

⁸¹ See Holman W. Jenkins, Jr., *Business World: The "Backdating" With Hunt*, WALL ST. J., Jun. 21, 2006, at A.13 (suggesting that backdating may have been transparent and that compensation committees may have adjusted the size of grants to account for the difference in value).

⁸² See Heron & Lie, *supra* note 2.

⁸³ See Murphy, *supra* note 9, at 2515.

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option grant at some point into a multi-year plan would have no bearing on the size of the grant.⁸⁴

Under a fixed value plan, by contrast, the determination of each particular option grant begins with the option value that the company wishes to confer on an executive. The number of shares subject to the grant is determined by calculating the Black-Scholes value of an option share and dividing the total value to be conferred by that Black-Scholes value.⁸⁵ Suppose, for example, that after reviewing their CEO's performance and the value of option grants received by the CEOs of peer companies, the compensation committee of Tech Co. decided that on January 1st of each of the next three years its CEO should receive an at-the-money option worth \$1 million. Suppose on 1/1/07, a compensation consultant calculated that the Black-Scholes value of an at-the-money option on the company's stock was \$20/share. The CEO would receive an option on 50,000 shares.

A 1998 report by the Towers Perrin consulting firm indicated that about two-thirds of the companies they had surveyed used some version of a fixed-value option plan.⁸⁶ For the largest companies the ratio was closer to fifty-fifty.⁸⁷ Similarly, Brian Hall analyzed large company CEO compensation from 1980 to 1994 and concluded that less than 40% of the companies studied utilized fixed-share option plans.⁸⁸

This evidence suggests that fixed-value plans are common and may produce half or more of the executive option grants arising from multi-year plans. However, not all executive option grants spring from multi-year plans. Company option programs generally allow for one-time discretionary option grants that may be used to hire, retain, or reward key executives. I am aware of no data on this point, but it seems likely that one-time option grants generally are value based. As noted above, even fixed-share option plans begin at some point with the option value to be conferred. The negotiation of a one-time grant would naturally focus on value first and shares after.

Finally, in some cases, we can be almost certain that executive option grants are based on value. For example, in Semtech Corporation's 2003 proxy statement, the company disclosed that certain option grants were received under a program allowing the executives to take 50% of their annual bonuses in the form of stock options.⁸⁹ These

⁸⁴ Suppose on 10/01/06 the compensation committee of Tech determines that its CEO should receive an at-the-money option on 50,000 shares on 1/1/07, 1/1/08, and 1/1/09. The 50,000 share figure would have been based on the Black-Scholes value of an at-the-money option on 10/01/06, the average stock price for the year, or perhaps even a share price target, but the actual market value of Tech's shares on January 1st would have no bearing on the size of the option grant.

⁸⁵ See Murphy, *supra* note 9, at 2515.

⁸⁶ See Towers Perrin, CompScan Report, Jan. 1998 (reported in Brian J. Hall, *The Design of Multi-Year Stock Option Plans*, 12 J. APPLIED CORP. FIN. 97, 102 (1999)).

⁸⁷ See *id.* Reporting on the same Towers Perrin survey, Kevin Murphy interpreted the results slightly differently. According to Murphy 40% of large company respondents granted options on a fixed-value basis, 40% on a fixed-share basis, and the remainder used variety of other methods. See Murphy, *supra* note 6, at 2515.

⁸⁸ See Hall, *supra* note 86, at 102. Hall classified a fixed-share plan as any that resulted in a CEO being granted an option on the same number of shares in any two years. See *id.*

One might conclude from the fact that the number of shares subject to particular executive option grants disclosed in company proxy statements often are round numbers that these grants are not value based, but this may not be the case. Grant size may be largely determined by value and Black-Scholes calculations and then adjusted up or down to a round figure based on other factors.

⁸⁹ Semtech Corp., Proxy Statement, filed May 7, 2003, at 13.

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grants represented a fairly small fraction of the executives' total option grants, but the numbers of shares subject to these options were almost surely derived by dividing the amount of the bonus to be converted by the Black-Scholes value of the options.

The situation with respect to options granted to rank and file employees may be very different. Again, I suspect that that options granted to hire or retain key employees generally are value based. However, routine annual option grants to the rank and file may be share based. Option overhang or potential dilution clearly plays a limiting role in option compensation at some companies. Companies often make references to this concern in their proxy statements. For example, Altera Corporation notes that it "monitor[s] dilution related to [its] equity incentive program by comparing net grants in a given year to the number of shares outstanding."⁹⁰ More specifically, Analog Devices noted in its most recent proxy statement that it planned to limit dilution related to its option program to 2.3% for fiscal year 2006.⁹¹

Apparently, option grants to the rank and file often result from the division of a pool of shares available for company-wide option grants. It would not be surprising that executives negotiated value-based option awards while rank and file employees accepted whatever fixed-share grants they were offered.

III. EXPLAINING BACKDATING

Now that we understand the value of backdating to option holders, we can begin in earnest to try and explain the phenomenon. Of course, it is futile to search for a single common thread explaining backdating at all firms. Undoubtedly, the motivations for backdating varied from company to company. Rather, the aim of this part is to lay out a range of possible rationales that in some combination explain backdating. On the other hand, the early empirical evidence and analysis of the value of backdating certainly suggest that some explanations are more persuasive than others.

In some cases backdating surely was undertaken to increase the compensation of senior executives. Backdating was an excellent device for delivering stealth compensation to executives, and the executives may have valued strike price discounts beyond their true economic value. However, anecdotal evidence and the empirical evidence available to date suggest that focusing solely on the executive suite misses much of the picture. Rank and file employees also received backdated options, and the prevalence of backdating appears to be associated with company-wide reliance on options as a form of compensation. Thus, we should seek explanations for backdating options granted to rank and file employees, as well. Again, compensation concealment probably played a key role, but we should also consider other possible explanations including share dilution limitations, cognitive biases, boosting ISO grants, and the influence of common advisors.

A. Executive Optionees

As we've seen, backdating to reduce option strike prices marginally boosts the *actual* per share value of an option grant, but substantially reduces the *apparent* per share

⁹⁰ Altera Corporation Proxy Statement, filed Apr. 3, 2006, at 14.

⁹¹ Analog Devices Inc., Proxy Statement, filed Feb. 8, 2006, at 23-24.

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value. To the extent that the size of executive stock option grants is determined by the apparent Black-Scholes value delivered, backdating would be a particularly effective form of stealth compensation. Investors, regulators, and corporate watchdogs would have been unaware of the additional compensation resulting from larger, backdated option grants until the options were exercised, and perhaps not even then, because the number of shares subject to an option grant in isolation is fairly meaningless. Compensation that is delivered below the radar screen minimizes investor outrage and can result in more total compensation for the executive.⁹² Simply put, investors don't complain about compensation they don't see.

One might object that this analysis assumes either too much or too little economic sophistication on the part of executives and their boards. The "too sophisticated" rebuttal is as follows: Although I've argued that backdating fixed-share option grants is much less valuable than the strike price discounts would suggest, economically unsophisticated executives may have focused solely on the strike price reduction achievable by backdating, without discounting for the possibility of the option lapsing out of the money. If so, we don't need a complicated story about engineering increased fixed-value option grants to understand backdating.

More generously, even an economically sophisticated CEO could be the victim of excessive optimism, which could cause her to discount the likelihood of poor performance and poor returns on option compensation. It would not be surprising to find that executives of young technology firms tend to be more optimistic about the prospects for their businesses than average business persons. If tech executives weren't optimistic about the business, they probably wouldn't have taken the positions. And an executive who placed a high probability on continuing share price increases would place a higher value on the strike price discounts attainable through backdating.

Moreover, an executive who valued the strike price discount resulting from backdating beyond the Black-Scholes value boost would be acting in a manner consistent with prospect theory.⁹³ According to this theory and experimental evidence, individuals deviate from expected utility maximization in excessively preferring certain gains to risky ones.⁹⁴ While both at-the-money and in-the-money options are risky, an in-the-money option is somewhat more certain to produce gains than an at-the-money option. Another prospect theory observation is that individuals tend to discard common elements of risk between choices and focus on the remaining differences.⁹⁵ If executives view the risk of options expiring out of the money as a common risk, they might focus solely on the difference in profits available ex ante from the two options being exercised in the money.

Less generously, there is the possibility that executive greed may at times be irrational. For example, executives often fight for small payments or reimbursements

⁹² See Bebchuk et al, *supra* note 10, at 789 (outlining a managerial power theory of executive compensation which relies heavily on investor outrage to provide compensation discipline); Bebchuk & Fried, *supra* note 10 (same).

⁹³ See Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 263 (1979).

⁹⁴ See *id.* at 265-67.

⁹⁵ See *id.* at 271-72.

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despite their apparent economic insignificance.⁹⁶ For all of these reasons we might expect executives to risk backdating even fixed share option grants despite the modest increase in actual expected value.

Heron and Lie's finding of an association between stock price volatility and a propensity to backdate executive stock options is consistent with naïve or cognitively biased valuation of backdating. Cherry picking grant dates is more likely to result in a deeply discounted strike price for a more volatile stock. I've argued that the added discount is more than offset by the dampening effect of volatility on Black-Scholes value, and that higher volatility is disadvantageous when backdating fixed share grants, but an economically unsophisticated individual might not see beyond the big strike price discount.

It is impossible to say as a theoretical matter whether backdating of executive stock options was driven more by the actual economics of backdating or simply a knee-jerk response to a strike price discount. To the extent that backdated option grants were based on a fixed number of shares and not the value of those shares, optimism, prospect theory, or naiveté would be the better explanation.

At the other end of the spectrum lies an objection based on a view that company directors are more economically sophisticated and watchful than generally assumed. Whether fairly priced option grants normally are value based or share based, according to this objection, directors would see through the backdating ruse and reduce the size of backdated option grants to reflect the true state of affairs.⁹⁷ In order for backdating to have benefited the executives, the executives must have either enlisted the assistance of the members of the compensation committee or fooled them.

In at least one instance it appears that the latter occurred. According to an affidavit supporting arrest warrants issued for several executives of Comverse Technology Inc., compensation committee members were duped into signing consent forms approving stock option grants that had been backdated, thinking they were approving standard at-the-money option grants.⁹⁸ This was not particularly difficult. Allegedly, the firm's general counsel, who participated in the scheme, called compensation committee members on date B telling them to expect the consent forms. When the committee members received the forms on date C, the forms listed options granted "as of" date A. The forms included signature lines for the committee members but no place to indicate the date of signing. The committee members assumed the "as of" date A was the same as date B, the date of the call, when in fact date A was much earlier. The only date on the consent form, date A, matched the strike price of the options.⁹⁹

If in other cases compensation committee members were aware that options were being backdated, it is not clear that they would have thought to have asked for any adjustment to reflect the fact, particularly if the executives' options were part of a

⁹⁶ For example, Dennis Kozlowski of Tyco was infamous for the personal items he charged to the company including a \$445 pincushion. See Andrew Ross Sorkin, *Tyco Details Lavish Lives of Executives*, N.Y. TIMES, Sept. 18, 2002, at C1.

⁹⁷ See Holman W. Jenkins, Jr., *Business World: The "Backdating" With Hunt*, WALL ST. J., Jun. 21, 2006, at A.13 (suggesting that backdating may have been used to establish the option strike price, leaving the board and executive to negotiate over the size, i.e., number of shares, of the package).

⁹⁸ See *United States v. Alexander*, No. M-06-817, (E.D.N.Y.) (Aff. in Support of Arrest Warrants) [hereinafter *Comverse Affidavit*].

⁹⁹ See *id.*

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company-wide option grant. One can imagine the CEO (or one of his minions) explaining it to the board like this: “We recommend granting options to all eligible employees dated as of August 15. Our stock was at its monthly low at that point, so this will be great for morale. We’re also asking you to approve our CEO’s \$1 million grant, dated the same day of course.” Left unsaid would be the fact that \$1 million “worth” of low strike purportedly at-the-money options would be worth much more than \$1 million.

B. Rank and File Optionees

I think we can safely conclude that executives would have had the motive and opportunity to backdate options for personal gain. But is the executive greed story consistent with the available evidence? Yes and no. As we’ve seen, the executives of semiconductor companies under investigation for backdating did not receive a larger percentage of total company option grants than their non-backdating peers. However, the backdating executives received substantially more option value each year on average than their non-backdating peers. Thus, these executives had more at stake when backdating.

However, there are several reasons to think that there is more to the backdating story than stealth compensation for executives. First, the early information suggests that tech firms were disproportionately involved in backdating.¹⁰⁰ It may turn out that the scandal is more widespread and tech firms have simply been the first firms identified, but let’s assume for the moment that the incidence of backdating was greater within this sector. What does that suggest? Tech firms are disproportionately heavy users of options, and tech executives tend to receive relatively more option compensation than their non-tech peers, but the big difference between option use at tech and non-tech firms lies outside of the executive suite. Option compensation generally is a much larger part of the compensation package of rank and file employees at tech firms.¹⁰¹ Thus, the preponderance of tech firms among companies under investigation suggests the possibility of a link between overall reliance on option compensation and backdating.

Comparison of identified backdaters within the semiconductor industry with their peers provides further support for this theory. The average employee of the firms under investigation for backdating received option grants that were about three times the value of the options received by their peers at firms not under investigation.¹⁰² Apparently, option compensation ran more broadly or deeply at backdating firms.

In addition, there is anecdotal evidence suggesting that non-executive employees frequently were the focus of backdating efforts. As noted, some companies have defended backdating practices as helpful in leveling the playing field between employees hired and granted options in rapid succession.¹⁰³ Moreover, the first complaint filed by

¹⁰⁰ See *supra* note 47 and accompanying text.

¹⁰¹ During the late 1990s and early 2000s, technology companies generally utilized broad-based option plans that covered most or all employees. See National Center for Employee Ownership, Employee Stock Option Fact Sheet, at <http://www.nceo.org/library/optionfact.html> (reporting that broad-based option plans are the norm at high-technology companies and reporting on research finding that 97 of the top 100 e-commerce companies offered options to most or all employees). Options are also popular outside the tech sector, but the frequency of broad-based plans is much lower. See *id.* (reporting that 15% of all public companies offered options to most or all employees).

¹⁰² See *supra* note 55 and accompanying text.

¹⁰³ See *supra* notes 23-26 and accompanying text.

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the SEC as a result of the scandal (against executives of Brocade Communications) details many instances of the company's CEO backdating options to help hire or retain key employees, but few instances of the CEO achieving direct personal gain through backdating.¹⁰⁴

Why would a CEO backdate an option to provide additional value to a potential hire? The Brocade complaint focuses on accounting consequences: Had the discounted options been properly accounted for there would have been expense recognition; backdating avoided expense recognition.¹⁰⁵ But that's only a partial answer. If the aim is to give a key employee an option worth \$1 million, why backdate? Why not simply give the employee a standard at-the-money option on enough shares to deliver value of \$1 million? What does backdating accomplish with respect to options granted to the rank and file that increased grant size alone does not?

1. Avoiding Share Limitations/Limiting Dilution

One possibility is that backdating companies were limited in the number of shares they could subject to new options without going back to their shareholders or that they felt constrained because of dilution concerns. As in the case of shares sold to the public, shares underlying stock option grants are limited by the number of authorized shares specified in each company's charter. Shareholder approval generally is required to amend the charter to increase the number of authorized shares.¹⁰⁶ In addition, the stock option plan documents that provide company executives the authority to issue options specify a maximum number of shares that may be issued under the plan.¹⁰⁷ When the shares available under a given plan are exhausted, a new plan is drafted and authorized. Today, shareholders must approve virtually all stock option plans, and thus must approve increases in the number of shares available for option grants.¹⁰⁸ Prior to 2003, shareholder approval was not required in all cases, but it was required with respect to plans that were used to grant ISOs,¹⁰⁹ plans designed to deliver performance-based pay per IRC § 162(m),¹¹⁰ and plans including company officers and directors if not broadly-based.¹¹¹ Shareholder approval of option plans limited to rank and file employees could be avoided, but with some difficulty.

Moreover, even if a CEO had shareholder authority to issue options on a very large number of shares or was able to circumvent shareholder approval, he might have felt constrained by investor pressure to limit the dilution of existing shareholders. In the

¹⁰⁴ See Brocade Complaint, *supra* note 5.

¹⁰⁵ See *id.*

¹⁰⁶ See, e.g., Del. Gen. Corp. L. § 242.

¹⁰⁷ See, e.g., Brocade Communications Systems, Inc., 1999 Nonstatutory Stock Option Plan § 3 ("the maximum aggregate number of Shares which may be optioned and sold under the Plan is one million (1,000,000) shares").

¹⁰⁸ See New York Stock Exchange Listed Company Manual § 303A.08 (requiring shareholder authorization of all equity compensation plans); NASDAQ Manual § 4350(i) (same).

¹⁰⁹ See IRC §§ 422(b)(1) (ISO requirements).

¹¹⁰ See Treas. Reg. § 1.162-27(e)(4)(i) (requiring shareholder approval of material terms of performance goals and hence option plans intended to satisfy IRC § 162(m)).

¹¹¹ See Special Study Group of the Comm. on Fed. Regulation of Sec., Am. Bar Ass'n, Special Study on Market Structure, Listing Standards and Corporate Governance, 57 BUS. LAW. 1487, 1509 (2002).

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late 1990s and early 2000s, there was a great deal of investor angst related to the potentially dilutive effects of what were viewed as run away option programs.¹¹²

Real or perceived share limitations may have influenced the decision to backdate option grants made to non-executive employees, versus the alternative of simply increasing the size of at-the-money grants. Recall, however, that backdating an option on a fixed number of shares produces only a marginal boost in value and that the boost is relatively less for options on highly volatile stocks.

2. Cognitive Biases

The share limitation explanation for backdating non-executive options seems more plausible if we add the possibility of employee naïveté or cognitive biases. Imagine a potential Brocade recruit who is offered an option on 100,000 shares with an exercise price not equal to the current market price of \$36, but equal to the \$24 low that the stock hit several months prior. An economically unsophisticated recruit, an individual acting in accordance with prospect theory, or a recruit who was unduly optimistic (again, not a surprising trait in a person joining a small tech firm in the 1990s) might place an excessive focus on the added value he would receive if his option wound up in the money, i.e., \$1.2 million, rather than the added Black-Scholes value of \$230,000.¹¹³ Perhaps Brocade's defense to shareholder suits should be that the company took advantage of cognitive biases and backdated options to recruit and retain good talent cheaply.

3. Hiding Total Compensation Expense

Another possibility is that companies backdated options granted to the rank and file in order to hide total corporate compensation expense from investors. I do not suggest that companies were seeking to minimize compensation expense deducted in calculating GAAP earnings. As noted above, prior to this year, firms were not required to record any expense for standard at-the-money options when calculating earnings per share.¹¹⁴

Nonetheless, obfuscation still could play a role. First, although the total value of options granted to the entire workforce is not disclosed in audited financial statements, the total number of shares subject to options granted is disclosed.¹¹⁵ Backdating rank and file options would have allowed firms to maintain value delivered via options while

¹¹² See, e.g., Joann S. Lublin & Leslie Scism, *Stock Options at Firms Irk Some Investors*, WALL ST. J., Jan. 12, 1999, at C1 (reporting concern of institutional investors related to dilutive effects of option plans); Robert McGough, *Tech Companies' Liberal Use of Stock Options Could Swamp Investors, Drain Firms' Resources*, WALL ST. J., Jul. 28, 2000, at C1 (same); Phyllis Plitch, *Fight Erupts over Stock-Option Plans; NYSE, Activists Are in Struggle over Shareholder Control*, WALL ST. J., Oct. 2, 2000 (reporting on controversial proposal by the SEC to continue to allow companies to adopt certain stock option plans without a shareholder vote).

¹¹³ See *supra* Part II.A calculating a \$2.32/share increase in the Black-Scholes value of an option on Brocade stock when the strike price is reduced from the \$36 fair market value of the stock to \$24/share. See *supra* Part III.A for discussion of prospect theory.

¹¹⁴ See *supra* note 13 and accompanying text.

¹¹⁵ See, e.g., Intel Corporation, 2002 Annual Report (Form 10-K), filed Mar. 11, 2003, at 65 (disclosing that as of December 28, 2002, employees of Intel held options on 845.4 million shares).

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marginally reducing the number of shares subject to these options. Second, sufficient information is provided in proxy statements to allow a dedicated analyst to estimate the average Black-Scholes value of options granted, specifically, expected volatility, expected life, the risk free interest rate, the shares subject to options, and the weighted average strike price.¹¹⁶ Reducing the average strike price through backdating would have resulted in lower estimated Black-Scholes values for a company's entire workforce, if anyone bothered to perform the calculation.

However, the need to estimate Black-Scholes values from proxy statement data was eliminated in 1995 when the FASB began requiring companies to include a pro forma earnings calculation in the footnotes to their financial statements that discloses the impact of stock options "as if" they had been expensed utilizing Black-Scholes methodology.¹¹⁷ Reducing strike prices through backdating would have decreased pro forma compensation expense substantially, just as it decreased the apparent value of executive option grants, although the extent to which investors and analysts focused on these pro forma earnings calculations is an open question.

4. Boosting ISOs

By increasing the effective size of ISO grants, backdating options granted to the rank and file could have provided a benefit to employees at the expense of taxpayers, rather than shareholders. As noted above, recipients of ISOs who meet the Code's holding requirements pay tax on their gains at the lower rate applicable to long term capital gains.¹¹⁸ This is obviously attractive for the employees. The downside is that companies granting ISOs are not permitted a compensation deduction for tax purposes. Of course, if an employer is not paying tax or is paying tax at a low effective rate, the loss of the deduction may be immaterial, and ISO tax treatment would be unambiguously favorable. Startup companies often are in a zero or very low effective tax bracket because their deductible expenses outweigh their income for several years.

Unfortunately, there is a non-inflation adjusted annual limit on ISO grants of \$100,000 per recipient. The \$100,000 limit applies to the aggregate fair market value of stock subject to ISOs that first become exercisable in a given year, and the dollar limit is based on the market value of the stock subject to the option on the date of the grant.¹¹⁹ The \$100,000 annual limit renders ISOs almost insignificant for senior executives who receive annual option grants valued in the millions, but for rank and file employees ISOs can be very significant and attractive.

To see how backdating can boost the value of ISO grants, consider the Brocade example once again. In January of 2002, Brocade's stock traded at an average price of \$36.56. Without backdating, each Brocade employee could have received an ISO with this strike price becoming exercisable in, say, 2005 on a maximum of 2735 shares.¹²⁰ The Black-Scholes value of that option (pre-tax) would have been approximately

¹¹⁶ See *id.* (reporting the following statistics for options granted during 2002: expected life, six years; risk-free interest rate, 3.7%; volatility, 49%.)

¹¹⁷ See SFAS 123, *supra* note 6.

¹¹⁸ See *supra* note 15 and accompanying text.

¹¹⁹ See IRC § 422(d).

¹²⁰ $\$100,000 / \$36.56 = 2735.23$ shares.

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\$68,271.¹²¹ Suppose instead that the ISO is backdated to October 31, 2001, when the stock traded at \$24.20. Reducing the strike price increases the maximum number of ISO shares to 4132. Moreover, this backdated option has pre-tax value of \$27.38/share, increasing the total value of the ISO grant to \$113,140, a 65% increase.

Even if the total number of shares available for option grants were limited, increasing the fraction of each optionee's grant that was afforded ISO tax treatment could have been a win-win for the employees and shareholders of backdating companies. Moreover, this benefit could not have been obtained without manipulating strike prices since one of the requirements for ISO treatment is that the option not be granted in the money. I have no evidence that boosting ISOs was even a contributing motive for backdating, but it surely was an effect.

5. Cover for Executive Option Backdating

Of course, it is also possible that options issued under broad-based plans were backdated to provide cover for executives to grant themselves backdated options. There is anecdotal evidence indicating that executives often were included in broad-based option grants that were backdated, but there is nothing to establish a causal connection.

For example, the affidavit filed in the Comverse case alleges that the company's CEO and senior executives routinely participated in annual company-wide option grants that were backdated to reduce strike prices. In November of 1999, for instance, the company issued options backdated to October 18 that covered over 3.8 million Comverse shares, 10% of which went to its CEO and two other senior executives.¹²²

Similarly, James Treacy, the CEO of Monster Worldwide, was the recipient of several suspiciously timed option grants. He participated, for example, in a broad-based grant of options covering over two million shares dated April 4, 2001. Monster's closing price on April 4th was its lowest of the first half of the year.¹²³

6. Herd Mentality/Common Advisors

The previous five factors may help explain why executives would wish to backdate options granted to their underlings. Each is consistent, or at least not inconsistent, with the high concentration of technology companies among firms under investigation and the apparent relationship between backdating and heavy company-wide reliance on option compensation. Of course, there is another potential explanation for the tech aspect of this scandal that has nothing to do with a particularly strong driving force favoring backdating in the tech sector. As some have noted weakly in their own defense, everyone in Silicon Valley seemed to be engaged in backdating options.¹²⁴ It is unlikely that each of the semiconductor and software companies currently under investigation for

¹²¹ 2735.23 shares x \$24.96/share (see *supra* Part II.A) = \$68,271.33.

¹²² See Comverse Affidavit, *supra* note 98, at 19-20.

¹²³ See Charles Forelle & Mark Maremont, *Monster Worldwide Gave Officials Options Ahead of Share Run-Ups*, WALL ST. J., Jun. 12, 2006, at A1. Monster's option pricing practices are currently the subject of SEC and Justice Department investigations. See *Perfect Payday*, *supra* note 1.

¹²⁴ See Rivlin & Dash, *supra* note 48.

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backdating originated the idea independently. Silicon Valley is a small community and ideas surely spread as employees move from firm to firm.

Early on in its coverage of the scandal, the New York Times reported that highly influential and respected Silicon Valley lawyer Larry Sonsini appeared to be a common link among backdating firms.¹²⁵ In itself, that is not surprising. Sonsini has advised a great many Silicon Valley firms so if Silicon Valley firms are implicated, his name likely will appear. Nonetheless, it may be that the concentration of tech firms in the pool of companies under investigation is partially explained by common advisers who either suggested or condoned the practice.¹²⁶

IV. GOING FORWARD

Backdating undoubtedly was the product of a confluence of the foregoing factors and others, and the mix of ingredients surely varied from firm to firm. As a result, we should be skeptical of simple solutions offered to prevent future episodes of backdating or similar behaviors. I will not attempt to “solve” the backdating problem in this short essay, but I will highlight one important implication for those involved in cleaning up the current mess, voice warnings about two steps that have already been taken that may appear to fix the problem, and very briefly outline what I see as the most promising long-term approach to overcoming the pathologies revealed by the backdating scandal.

A. Calculating Damages in Backdating Litigation

In the near term, litigation of backdating claims will dominate the headlines. We can expect many of the cases under SEC and/or Justice Department investigation to result in suit, and shareholder litigation probably is already underway with respect to most of the identified backdaters. It is important that prosecutors, shareholders, or others seeking recompense from executives shown to have participated in backdating take care not to *underestimate* executives’ backdating gains. As we have seen, factoring in the effect of backdating on the size of option grants is the key to accurate calculations of gain, a point that could easily be overlooked.

For example, the Comverse affidavit discussed above alleges that between 1991 and 2005 the company’s CEO reaped profits of \$138 million on options and states that a preliminary analysis indicates that almost \$6.4 million of that profit was due to backdating.¹²⁷ \$6.4 million is real money, but note that the sum represents less than 5% of the CEO’s option profits. The affidavit does not discuss how the backdating gain was derived, but it is reasonable to assume that the analyst simply recalculated the gains that would have been realized had the option strike prices been set at the market price of the stock on the actual dates of the grants instead of the lower, backdated prices. But such an analysis implicitly assumes that the number of option shares was fixed. If the size of the

¹²⁵ See Gary Rivlin, *A Counselor Pulled from the Shadows*, NY TIMES, Jul. 30, 2006 (reporting that the Wilson Sonsini law firm had represented just under 50% of the Silicon Valley companies implicated in the scandal).

¹²⁶ Cf. John C. Coates IV, *Explaining Variation in Takeover Defenses: Blame the Lawyers*, 89 CAL. L. REV. 1301 (2001) (providing evidence that lawyers determine key terms in the “corporate contract”).

¹²⁷ See Comverse Affidavit, *supra* note 98.

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option grants were based on value instead, a point that should be resolvable through discovery, backdating would have increased the number of option shares as well as lowering the exercise prices, and the gains attributable to backdating would be substantially larger.

Underestimating the gains from backdating could raise questions in the minds of judges or jurors as to the culpability of the executives involved. Underestimation could also limit damages or restitution awards in some cases. If proved, the backdating allegations reported to date in cases like Brocade and Comverse represent clear breaches of fiduciary duty.¹²⁸ Retroactive cancellation and disgorgement of all profits derived from fraudulently procured options may be the appropriate remedy in many of these cases.¹²⁹ In some cases, however, options represented over 95% of senior executive compensation.¹³⁰ Because complete disgorgement would leave these executives with virtually no compensation for their work, courts may lean towards disgorgement of the additional profits achieved as a result of backdating, in which case accurate determination of gains will be critical.¹³¹

B. Accounting Changes

Under recently adopted accounting rules there is no longer an earnings penalty associated with granting in-the-money options. Going forward, compensation expense must be recorded for all option grants based on their value.¹³² This is a very positive accounting development, but I would expect it to have zero effect on backdating or other option pricing manipulation. Backdating may have been about stealth compensation, but it was never really about reported earnings per share.

It would be easy to conclude otherwise from the emphasis on accounting in the SEC's complaint against the executives of Brocade Communications. A prominent allegation is that "[b]y falsifying the dates on which options were purportedly granted, [Brocade's CEO] and others materially understated Brocade's expenses and overstated its income, and falsely represented in certain filings that Brocade had incurred no expense for options grants."¹³³ Although this is true as a technical matter, if the SEC's point is that Brocade intended to conceal the true extent of compensation expense through backdating, this is a red herring. As should be clear by now, under its former rules the Financial Accounting Standards Board allowed companies unlimited freedom to

¹²⁸ Executives who take undisclosed compensation from their firms violate the duty of loyalty. See ROBERT CHARLES CLARK, CORPORATE LAW 171 (1986).

¹²⁹ See, e.g., *State ex rel. Hayes Oyster Co. v. Keypoint Oyster Co.*, 391 P.2d 979 (Wash. 1964) ("whatever a director or officer acquires by virtue of his fiduciary relation, except in open dealings with the company, belongs not to such director or officer, but to the company").

¹³⁰ At Broadcom Corp., for example, the CEO and senior executives received salaries of just over \$100,000/year. Over 97% of their total compensation came in form of option grants. Data from Execucomp.

¹³¹ See *Intern. Telecharge, Inc. v. Bomarko, Inc.*, 766 A.2d 437 (Del. 2000) (holding that although a fiduciary should not profit from conduct breaching the duty of loyalty, the Court of Chancery has discretion in crafting an appropriate remedy).

¹³² See Financial Accounting Standards Board, Statement of Financial Accounting Standards No. 123 (revised 2004) (Dec. 2004) (mandating "fair value" accounting for stock options effective beginning in 2005 and 2006).

¹³³ Brocade Complaint, *supra* note 5, at 2.

understate their expenses and overstate their reported income through liberal use of at-the-money options.

Imagine, moreover, that the accounting rules in the 1990s had treated in-the-money options just like at- or out-of-the money options, i.e., had required no recognition of expense. Imagine also that there were no tax penalties associated with granting in-the-money options. Would companies have simply granted in the money options rather than backdating? No. At least not to the extent that backdating was designed to deliver stealth compensation. Recall that the only difference between a fully disclosed in-the-money option grant and a backdated, purportedly at-the-money grant with the same strike price is the apparent value calculated on the basis of the stated terms. An executive who had negotiated \$1 million of option compensation would gain nothing by swapping an at-the-money option for a fully disclosed in-the-money option. The number of shares in each case would be calculated to deliver \$1 million of value.

Finally, if companies gained any accounting advantage by backdating, it was in minimizing the overall compensation expense reported in the footnotes to accounting statements. Those footnotes have now been elevated to text, so the incentive to minimize the apparent value of options remains.¹³⁴

C. Disclosure Changes

On the other hand, as Heron and Lie have shown, changes in option grant reporting requirements mandated by the Sarbanes-Oxley Act have substantially curtailed backdating of stock options granted to senior executives.¹³⁵ Companies are now required to report executive option grants to the SEC by the close of the second business day following the grant. To the extent executives comply with this rule (and compliance has not been perfect), the look back period for backdating is essentially cut to two days, eliminating most of the opportunity for cherry picking.

This new rule is not a complete panacea, however, for three reasons. First, it is not being closely enforced.¹³⁶ That is easily fixed and should be. Second, while the new rule all but prevents backdating of executive options, it does not prevent other forms of manipulation such as front running, the practice of hurriedly granting options in advance of the release of positive company news. Third, the rule only applies to company officers and directors, so-called Section 16 insiders.¹³⁷ The rule does not pose an obstacle to backdating options to rank and file employees, even highly compensated rank and file employees who are not in a high enough position to qualify as statutory insiders. While expanding the reach of the two-day option grant reporting requirements to include all recipients would eliminate this gap, the reporting burden would be extreme.

D. Reducing Compensation Complexity

¹³⁴ In addition, tax rules continue to preclude ISOs and non-qualified option grants to top executives from being granted in the money.

¹³⁵ See Heron & Lie, *supra* note 32.

¹³⁶ See *id.*

¹³⁷ See Securities Exchange Act of 1934 § 16(a)(1) (defining the class of persons required to file reports with the SEC disclosing changes in beneficial ownership of securities).

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It is fair to say that for most investors, corporate watchdogs, and other observers, the backdating scandal came out of the blue. We had many concerns about the efficiency of stock option design and the size of the grants, but we had not dreamed that companies were cherry picking grant dates to minimize the apparent value of options while boosting their value. It is easy to say that we won't be fooled again, but history says otherwise.

The fundamental problem here is one of agency costs and compensation complexity. Stock options were embraced as a means of increasing the alignment between managerial and shareholder interests – a partial solution to the agency problem – but executives have exploited the complexity of stock option programs to further their own interests – demonstrating the intractability of the agency problem. We can continue to tweak accounting, tax, and disclosure rules, but it is becoming increasingly obvious that it is simply too difficult and costly to monitor all the details of the myriad components of modern executive compensation packages. As I have argued elsewhere, rather than attempting to plug the holes through which executives siphon off unbargained-for compensation, we should focus our efforts on reducing compensation complexity and the opportunities for insider manipulation.¹³⁸

Focusing on stock options in particular, the backdating scandal demonstrates the ease with which executives have been able to manipulate the timing and pricing of conventional options. We should ask what would be lost by replacing options with simplified long-term incentive programs that are less susceptible to manipulation, tying compensation to gains in yearly average share prices, for example, rather than the gain arising between two dates, both of which, it turns out, may have been advantageously selected by the executive. Simplified plans would not have to be limited to cash payouts – shares could still be the medium for payment by cash-strapped start-ups – but as recognition of the severity of the agency problem grows, sacrificing equity compensation design features that would be efficiency enhancing in a world with zero agency costs for simpler, less manipulable equity-based incentive programs seems less of a sacrifice.

CONCLUSION

Clearly, much more could be said about the causes and consequences of backdating. In an attempt to keep this essay brief, however, I have chosen to focus my analysis on the economics of backdating, specifically the value to optionees, and, to a lesser extent, on the characteristics of firms under investigation. The economic analysis highlights the critical importance of ascertaining how the sizes of grants were determined in order to assess the value of backdating to option recipients. Strike price discounts in isolation, although loudly trumpeted in the press, tell us little. An empirical comparison of semiconductor firms that currently are and are not under investigation for backdating options reveals several points of interest and suggests that it would be a mistake to focus solely on the executive suite in attempting to explain backdating. Of course, these empirical results are preliminary and will no doubt require revision as the investigatory web captures more firms. At the very least, however, these early results should focus researchers on the appropriate questions going forward.

¹³⁸ See David I. Walker, *The Manager's Share*, 47 WM. & MARY L. REV. 587 (2005).

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Appendix A: Companies listed by the Wall Street Journal as of 9/8/06 as being under
SEC investigation with respect to past stock option grants

| Company | Symbol | SIC | Company | Symbol | SIC |
|-------------------------|---------------|------------|------------------------------|---------------|------------|
| Delta Petroleum | DPTR | 1311 | Cyberonics Inc. | CYBX | 3845 |
| KB Home | KBH | 1531 | Stolt-Nielson SA | SNSA | 4412 |
| Alkermes | ALKS | 2834 | Boston Communications | BCGI | 4812 |
| KOS Pharmaceuticals | KOSP | 2834 | Equinix | EQIX | 4813 |
| Sepracor | SEPR | 2834 | Cablevision | CVC | 4841 |
| Medarex | MEDX | 2836 | American Tower | AMT | 4899 |
| Asyst Technologies | ASYT | 3559 | Home Depot | HD | 5211 |
| Brooks Automation | BRKS | 3559 | CEC Entertainment | CEC | 5812 |
| Blue Coat Systems | BCSI | 3572 | Cheesecake Factory | CAKE | 5812 |
| M-Systems | FLSH | 3572 | Caremark Rx | CMX | 5912 |
| Brocade | BRCD | 3576 | Barnes and Noble | BKS | 5940 |
| Foundry Networks | FDRY | 3576 | Michael's Stores | MIK | 5945 |
| SafeNet | SFNT | 3577 | United HealthCare | UNH | 6324 |
| Engineered Support Sys. | EASI | 3585 | Macrovision | MVSN | 6794 |
| Comverse Technology | CMVT | 3661 | Monster Worldwide | MNST | 7311 |
| Sycamore Networks | SCMR | 3661 | Crown Castle | CCI | 7359 |
| Jabil Circuit | JBL | 3672 | CNET Networks | CNET | 7370 |
| Sanmina-SCI | SANM | 3672 | Computer Sciences | CSC | 7370 |
| Altera | ALTR | 3674 | Activision | ATVI | 7372 |
| Analog Devices | ADI | 3674 | Autodesk | ADSK | 7372 |
| Applied Microcircuits | AMCC | 3674 | Chordiant Software | CHRD | 7372 |
| Atmel | ATML | 3674 | Intuit | INTU | 7372 |
| Broadcom | BRCM | 3674 | McAfee | MFE | 7372 |
| Linear Technology | LLTC | 3674 | Mercury Interactive | MERQ | 7372 |
| Marvell Technology | MRVL | 3674 | Openwave Systems | OPWV | 7372 |
| Maxim Int. Products | MXIM | 3674 | Progress Software | PRGS | 7372 |
| Power Integrations | POWI | 3674 | Quest Software Inc. | QSFT | 7372 |
| QuickLogic | QUIK | 3674 | RSA Security | RSAS | 7372 |
| Semtech | SMTC | 3674 | Take-2 Interactive Software | TTWO | 7372 |
| Sigma Designs | SIGM | 3674 | THQ | THQI | 7372 |
| Trident Microsystems | TRID | 3674 | VeriSign | VRSN | 7372 |
| Vitesse Semiconductor | VTSS | 3674 | F5 Networks | FFIV | 7373 |
| Xilinx | XLNX | 3674 | Nyfix Inc. | NYFX | 7373 |
| Zoran | ZRAN | 3674 | Redback Networks | RBAK | 7373 |
| Sysview Technology | SYVT | 3679 | Verint | VRNT | 7373 |
| KLA-Tencor Group | KLAC | 3827 | Affiliated Computer Services | ACS | 7374 |
| Meade Instruments | MEAD | 3827 | Apollo Group | APOL | 8200 |
| Endocare | 3ENDO | 3841 | Corinthian Colleges | COCO | 8200 |
| Arthrocare | ARTC | 3845 | | | |

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Appendix B: SIC code 3674: Semiconductors and Related Devices. Firms under investigation or suspicion of backdating and control companies.

| Backdating Companies¹³⁹ | Symbol | Control Companies¹⁴⁰ | Symbol |
|---|---------------|--|---------------|
| Altera | ALTR | Micron Technology | MU |
| Analog Devices | ADI | Advances Micro Devices | AMD |
| Applied Microcircuits | AMCC | LSI Logic | LSI |
| Atmel | ATML | National Semiconductor | NSM |
| Broadcom | BRCM | Fairchild Semiconductor | FCS |
| Linear Technology | LLTC | Conexant Systems Inc. | CNXT |
| Maxim Int. Products | MXIM | Cypress Semiconductor | CY |
| Power Integrations | POWI | International Rectifier | IRF |
| QuickLogic | QUIK | Integrated Device Technology | IDTI |
| Semtech | SMTC | Microchip Technology Inc. | MCHP |
| Trident Microsystems | TRID | RF Micro Devices | RFMD |
| Vitesse Semiconductor | VTSS | Lattice Semiconductor | LSCC |
| Xilinx | XLNX | Phototronics | PLAB |
| Zoran | ZRAN | ESS Technology | ESST |
| Nvidia | NVDA | Triquint Semiconductor | TQNT |
| PMC-Sierra | PMCS | Skyworks Solutions | SWKS |
| Micrel | MCRL | Microsemi | MSCC |
| | | Actel | ACTL |
| | | Standard Microsystems | SMSC |
| | | Innovex | INVX |
| | | Three-Five Systems | TFSIQ |
| | | Neomagic | NMGC |
| | | Cree | CREE |
| | | AXT | AXTI |
| | | Alliance Semiconductor | ALSC |
| | | Exar | EXAR |
| | | Pericom Semiconductor | PSEM |
| | | Transwitch | TXCC |
| | | Supertex | SUPX |
| | | Kopin | KOPN |

¹³⁹ The backdating companies group begins with the SIC 3674 companies listed in Appendix A. Marvell Technology and Sigma Designs were eliminated from the sample because sufficient data was not available in Compustat. Nvidia, PMC-Sierra, and Micrel, although not currently under investigation by the SEC, were included based on admissions or announced internal investigations.

¹⁴⁰ The control group includes all other SIC code 3674 companies that were in existence in 1998 and for which sufficient data was available in Execucomp and Compustat, except for Intel and Texas Instruments, which were omitted from the control group. Both companies had revenue and employment figures vastly greater than the largest 3674 backdating companies and thus did not provide a proper reference for comparison.

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Appendix C: Comparisons of the SIC code 3674 backdating and control groups¹⁴¹

| Variable | Backdating Group (N=17) | | | Control Group (N=30) | | |
|---|--------------------------------|---------------|------------------|-----------------------------|---------------|------------------|
| | Mean | Median | Std. Dev. | Mean | Median | Std. Dev. |
| Percentage of employee stock options issued to the top five executives* | 13.83% | 12.70% | 8.37% | 18.71% | 17.38% | 7.56% |
| Black-Scholes value of options issued to the top five executives (\$ million) | 16.256 | 17.638 | 15.324 | 10.041 | 5.756 | 10.434 |
| Black-Scholes value of options issued to top five executives divided by total company revenue | 4.72% | 2.66% | 7.43% | 3.07% | 1.76% | 3.60% |
| Estimated Black-Scholes value of options granted company wide per employee (\$)** | 124,668 | 70,538 | 147,785 | 42,520 | 22,317 | 55,594 |

* / ** Indicates difference in means statistically significant at the 5% / 1% level.

¹⁴¹ 1998 to 2002 data. For each company, five year averages were calculated for each variable. Means and medians reported are based on those five-year averages.