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UNPACKING BACKDATING: ECONOMIC ANALYSIS AND OBSERVATIONS ON THE STOCK OPTION SCANDAL

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DAVID I. WALKER

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UNPACKING BACKDATING: ECONOMIC ANALYSIS AND OBSERVATIONS ON THE STOCK OPTION SCANDAL

DAVID I. WALKER*

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The corporate stock option backdating scandal has dominated business page headlines since the summer of 2006. The SEC has launched investigations of more than one hundred 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 continues to increase. This Article 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 impact on the value per share of backdated options. 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, backdating dramatically reduced the apparent value of options, which reduced the total level of executive compensation reported to shareholders. However, because the size of executive stock option grants often is determined by first establishing the value to be delivered and then “backing into” the number of shares to be covered by the option, reducing the apparent value of option shares may have substantially increased the size and economic value of some 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 Article considers the effects of and several possible explanations for backdating non-executive options, including reducing apparent rank and file compensation. Finally, this Article argues that the backdating phenomenon is not an accounting scandal. Backdating has accounting consequences, but it is unlikely to have been accounting driven.

INTRODUCTION

In the summer of 2006, just when the business community thought it could relax following the Enron, WorldCom, and Tyco debacles, it became embroiled in a corporate stock option backdating scandal. In the year since the scandal was uncovered, the SEC has launched investigations into suspicious timing and pricing of stock options granted during the go-go years of the late 1990s and early 2000s at more than one hundred companies.¹ And recent papers suggest that this figure represents only the tip of the iceberg – that perhaps 10% to 20% of options issued to senior executives during this period may have been backdated in order to reduce option exercise prices.² By any measure, this problem is much more pervasive than the accounting frauds orchestrated by Jeff Skilling, Bernie Ebbers, and Dennis Kozlowski.

The backdating scandal is both more pervasive and, given the complexity of option valuation, in some ways more impenetrable. The primary aim of this Article is to unpack the payoffs to backdating – to determine the effects of backdating on the actual values of options granted, and in the case of backdated executive stock options, on the values reported to investors. Understanding the economics and the optics of backdating is a vital first step in illuminating the motivations and in thinking about solutions. However, without losing sight of job one – economic analysis – this Article seeks to paint a fuller picture of backdating by providing background and context, comparing the characteristics of identified backdaters within one industry with their peers,

¹ See *Perfect Payday: Options Scorecard*, WALL ST. J. ONLINE, <http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html> (last visited June 12, 2007) [hereinafter *Perfect Payday*]. Companies subjected to SEC investigation with respect to the pricing or timing of stock option grants through June 12, 2007, are listed in Appendix A.

² See Lucian Bebchuk et al., *Lucky CEOs* 16-17 (John M. Olin Ctr. for Law, Econ. & Bus., Discussion Paper No. 566, 2006), available at http://www.law.harvard.edu/programs/olin_center/papers/pdf/Bebchuk_et%20al_566.pdf (finding that 9% of CEO option grants made between 1996 and 2005 were manipulated to achieve a strike price equal to one of the three lowest priced days of the month); Randall A. Heron & Erik Lie, *What Fraction of Stock Option Grants to Top Executives Have Been Backdated or Manipulated?* 12 (Nov. 1, 2006) (unpublished manuscript), available at <http://www.biz.uiowa.edu/faculty/elie/Grants-11-01-2006.pdf> (estimating that 18.9% of unscheduled grants – grants not made on a certain date each year – were backdated or manipulated).

and offering some initial observations on backdating outside of the executive suite.

Although option valuation is complex, at one level the backdating story is simple. Imagine that on March 15 the stock of Tech Inc. closes at \$50/share. An option on Tech granted on that date would normally have an exercise price of \$50/share. Granting the option “at the money” ensures that the recipient profits only 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 \$40/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 interesting than it appears on the surface. Importantly, press reports that focus on the option strike price “discount” achieved through backdating significantly overstate the impact on the value per share of backdated options.³ 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 \$1/share reduction in the exercise price of an option may have been worth less than twenty cents per option share to the recipient.⁴

On the other hand, unnoticed in the discussion thus far is the fact that backdating dramatically reduced the *apparent* value of options. By apparent value, I mean the grant date value that one would calculate for the option the company purported to issue, and which, in the case of options issued to senior executives, would have been reported in company proxy statements, Standard and Poor’s ExecuComp database, and other publications.⁵ All else being equal, the value of an at-the-money option on a share of stock with a market price of \$40/share is 80% of the value of an at-the-money option on a share of stock with a market price of \$50/share.⁶ Thus, in the Tech Inc. hypothetical, backdating would have reduced the reported value of the CEO’s option by 20% even if we ignore the positive effect that backdating would have had on the actual value of the option.

³ See, e.g., Charles Forelle & James Bandler, *The Perfect Payday: Some CEOs Reap Millions by Landing Stock Options When They Are Most Valuable*, WALL ST. J., Mar. 18, 2006, at A1.

⁴ See *infra* Part II.A.

⁵ For example, the value of options granted to the CEOs of Fortune 500 companies are reported annually in *The New York Times* and *The Wall Street Journal*. See, e.g., *CEO Compensation Survey/2005*, WALL ST. J., Apr. 10, 2006, at R8; *Executive Pay: A Special Report*, N.Y. TIMES, Apr. 9, 2006, § 3, at 8.

⁶ See *infra* note 132 and accompanying text.

The fact that backdating effectively concealed a significant fraction of the grant date value of affected options is important for two reasons. First, the grant date value of options is widely used in assessing an executive's total compensation and making peer-to-peer comparisons.⁷ To the extent that surreptitious backdating resulted in an executive's compensation appearing smaller than that of her peers, backdating may have assisted the executive in negotiating larger pay packages going forward.

Second, because backdating reduced apparent option values, the process may have resulted in larger executive stock option grants in some cases.⁸ At some companies, the size of an executive option grant is based on its value rather than a set number of shares. At these firms, 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 \$40/share rather than \$50/share, and used the apparent value of the purported at-the-money option in making its calculations, would have increased the number of shares covered by the grant by 25%.

Although Congress and the SEC have augmented executive compensation disclosure requirements in recent years, current disclosures do not allow us to determine whether particular option grants are based on value or a set number of shares.⁹ Thus, prosecutors and plaintiffs must dig through compensation committee and board records to determine the actual impact of backdating on the size and value of option grants.

Ultimately, however, even in cases in which grant size was unaffected by backdating, this Article contends that the reduction in option strike prices produced stealth compensation for executives. It has been argued that nothing was hidden, that disclosures were adequate to allow market participants to accurately calculate the value of backdated options.¹⁰ But calculating the value of an option at a point in time and determining the expected value of an option at grant are very different propositions. At any point following grant, option value reflects subsequent stock price movements resulting from any number of factors. Analysts examining option values ex post would have great difficulty distinguishing option gains resulting from backdating and discounting from gains due to luck or skill. As a result, compensation assessment is focused on the grant date value of options, and underreporting those values would have been an effective way of hiding compensation.

Note that I have said nothing about accounting for stock options. Press reports and government documents suggest that companies backdated options

⁷ See *infra* Part II.F.

⁸ See *infra* Part II.C-D.

⁹ See *infra* notes 117-19 and accompanying text.

¹⁰ See *infra* Part II.E.

to avoid taking an accounting hit for compensation expense,¹¹ 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.¹² Moreover, 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 has accounting consequences when discovered, 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.

Focusing solely on the executive suite in thinking about backdating would also be a mistake. Backdating was by no means limited to options granted to senior executives. A comparison of semiconductor firms under investigation for backdating with peer companies that are not reveals that “backdating” executives received a smaller fraction of company-wide option compensation than their non-backdating peers, and the average employee of backdating firms received a much larger amount of option compensation than his non-backdating peers.¹³ 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 Article considers a number of possibilities, including minimizing apparent rank and file compensation, avoiding share limitations, increasing the fraction of options qualifying for employee-favorable tax treatment, taking advantage of cognitive biases, and providing cover for executives to grant themselves valuable backdated options. It also acknowledges the possibility that common advisors might explain the high concentration of technology firms among the companies under investigation for backdating.

The remainder of this Article is organized as follows. Part I provides background on the backdating phenomenon. The core of Part II is an economic analysis that explicates the effects of undisclosed and undiscovered

¹¹ See, e.g., Complaint at 1, SEC v. Reyes, No. C-06-4435 (N.D. Cal. July 20, 2006) [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., July 21, 2006, at A1 (discussing allegations in the Brocade case).

¹² See ACCOUNTING FOR STOCK-BASED COMPENSATION, Statement of Fin. Accounting Standards No. 123, ¶¶ 306-16 (Fin. Accounting Standards Bd. 1995) [hereinafter SFAS 123 (1995)]. The original SFAS 123 was subsequently revised in 2004. See SHARE-BASED PAYMENT, Statement of Fin. Accounting Standards No. 123R, ¶ 3 (Fin. Accounting Standards Bd. 2004) [hereinafter SFAS 123R (2004)].

¹³ See *infra* Part II.C.

backdating on the value of options received and option compensation reported to investors. Although the focus is on effects, the results clearly speak to motivation as well, and Part II concludes by briefly considering alternative explanations. Much of the analysis in Part II applies equally to backdated options issued to non-executive employees, but the focus is on executive stock options, leaving specific analysis of backdating non-executive options for Part III. Part IV offers a few brief suggestions and warnings as we deal with the current scandal and look beyond.

I. BACKGROUND ON THE BACKDATING PHENOMENON

The bulk of this Article focuses on the economics and effects of undisclosed and undiscovered backdating, providing a sense of the benefits realized by executives who backdated their own options or options issued to their subordinates. We should begin at the beginning, however, with an overview of stock option practice, a discussion of the scandal and the tax and accounting effects of revealed backdating, and a brief look at the firms under investigation to date and how they compare to their peers, who either did not backdate or have not yet been caught.

A. *Stock Option Design and the Importance of 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. Stock options accounted for over two-thirds of the total compensation granted to the CEOs of two hundred large U.S. public companies surveyed in 2001,¹⁴ and over half of total compensation in 2002,¹⁵ 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 United States tend to be extremely uniform in design. Generally, the options 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), become exercisable or “vest” over a period ranging from one to five years following the grant, expire ten years after the date of the grant, and are not transferable.¹⁶

¹⁴ See *Executive Pay: A Special Report*, N.Y. TIMES, Apr. 7, 2002, § 3, at 8.

¹⁵ See *Executive Pay: A Special Report*, N.Y. TIMES, Apr. 6, 2003, § 3, at 8.

¹⁶ See Kevin J. Murphy, *Executive Compensation*, in 3 HANDBOOK OF LABOR ECONOMICS 2485, 2507-10 (Orley Ashenfelter & David Card eds., 1999). Compensatory stock options

These design features are not totally arbitrary, although their ubiquity and consistency is in some ways surprising.¹⁷ Unlike traded options that are exercisable immediately and 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 stock options that are discussed below.¹⁸ However, unlike traded options, compensatory options are normally exercised well before expiration.¹⁹

A combination of at best arbitrary and arguably irrational tax and accounting rules have all but dictated 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.²⁰

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”).²¹ An at-the-money option has no intrinsic value under this formula, although it clearly has substantial real world value. Thus, the grant of an at-the-money option resulted in zero recognized expense for financial reporting purposes.²² On the other hand, an option that was granted in the money would result in a charge to

of this nature are referred to as 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.

¹⁷ 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. See LUCIAN BEBCHUK & JESSE FRIED, *PAY WITHOUT PERFORMANCE* 137-73 (2004); 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).

¹⁸ See I.R.C. § 422(b)(3) (2000).

¹⁹ See *infra* note 94 and accompanying text.

²⁰ See Murphy, *supra* note 16, at 2509 tbl.5 (finding that out-of-the-money grants comprised about 1.5% of grants in a sample of CEO options issued in fiscal year 1992).

²¹ See ACCOUNTING FOR STOCK ISSUED TO EMPLOYEES, Opinion of the Accounting Principles Bd. No. 25, ¶ 10 (Am. Inst. of Certified Pub. Accountants 1972) [hereinafter APB Opinion No. 25].

²² Although at-the-money options resulted in no adjustment to reported earnings, this does not mean that there was no disclosure of option compensation. Senior executive option compensation was disclosed in corporate proxy statements and, since 1995, company-wide option compensation has been reported in footnotes to annual financial statements. See *infra* notes 117-19, 183 and accompanying text.

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.²³ 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. I.R.C. §§ 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 tax rate applicable to long-term capital gains.²⁴ 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.²⁵ In other words, to qualify as an ISO, the option must be granted at or out of the money.

In addition, I.R.C. § 162(m) limits the corporate deduction for non-performance-based compensation paid to certain senior executives to \$1 million per year.²⁶ Stock options automatically qualify as performance-based pay and result in a tax deduction if certain requirements are met. Again, one requirement is that the options be granted at or out of the money.²⁷

One might 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 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,²⁸ 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.²⁹ In any event, through this combination of

²³ See SFAS 123 (1995), *supra* note 12, ¶¶ 306-16.

²⁴ See I.R.C. § 421(a)(1) (2000) (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. However, the tax advantage enjoyed by the ISO recipient comes at a cost to the employer. Companies are not allowed a tax deduction for compensation expense arising from options that qualify as ISOs. See *id.* § 421(a)(2).

²⁵ See *id.* § 422(b)(4).

²⁶ See *id.* § 162(m).

²⁷ See Treas. Reg. § 1.162-27(e)(2)(vi)(A) (as amended in 1996).

²⁸ See Bebchuk et al., *supra* note 17, at 818.

²⁹ 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

tax and accounting rules, Congress and the Financial Accounting Standards Board (FASB) severely penalized the grant of in-the-money options, and few public companies have granted such options.³⁰

B. *Option Grant Practice and 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 entailed 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 is fairly simple. To continue the Tech Inc. hypothetical, suppose the compensation committee actually agreed to grant an option on ten thousand shares of its stock to its CEO on March 15, when its shares were trading at \$50. However, documentation was produced describing an at-the-money grant on February 15, when the shares were trading at \$40, and thus the option carried a strike price of \$40/share. Effectively, the company granted the CEO an option that was \$10 in the money. Of course, the same result could have been achieved by granting the CEO an in-the-money option on March 15,³¹ but doing so would have had negative tax and accounting consequences and may have violated company restrictions on the pricing of options, which were undoubtedly written to ensure compliance with these tax and accounting rules.³²

Such restrictions appear in firms' shareholder-approved equity compensation plans. These multiyear plans govern all aspects of stock option grant and exercise, and they are generally designed to provide maximum

zero exercise price. Of course, an executive should not expect to receive the same number of restricted stock shares as he would shares covered by an at-the-money option.

³⁰ Given the recent revisions to the accounting rules for options, today there would be no accounting or tax penalty associated with granting in-the-money options to employees below the senior executive ranks, as long as the options were not intended to qualify as ISOs. However, I am not aware of any company that has taken advantage of the opportunity to openly grant in-the-money options. While this fact might be taken as evidence rebutting an efficiency explanation for backdating, *see infra* note 171 and accompanying text, it is likely that the issuance of in-the-money options would be met by a level of outrage that would overwhelm any efficiency benefits.

³¹ To perfectly mirror the effect of backdating, the vesting date would have to be adjusted as well.

³² However, few backdating companies would have issued in-the-money options even absent these rules; doing so would have eliminated the stealth compensation achieved through backdating. *See infra* Part IV.B.

flexibility to the administrator, which facilitated backdating.³³ These plans typically set a limit on the total number of shares that may be optioned, a per employee limit on shares optioned in any fiscal year, and, in some cases, limits on option exercise prices.³⁴ However, within these broad confines, options may be granted from time to time during the year to individual employees or groups of employees.³⁵ Responsibility for administering these plans normally is vested in a committee of the board, but in practice compensation committees delegate much of the detailed implementation to the executives. The degree of delegation is a function of the level of the option recipient. Thus, while the compensation committee typically would approve the size of specific executive option grants based on the recommendations of the company's compensation consultant, they might approve a pool of options to be awarded to rank and file employees and leave selection of particular recipients and award size to the executives. However, even with respect to executive option grants, some compensation committees delegated sufficient discretion over timing to allow executives to look back and select an attractive date as a purported grant date, and maintained such insufficient controls that the committee members were unaware that they were signing off on backdated options.³⁶

In contrast to such surreptitious backdating of executive stock options, options granted to rank and file employees were openly manipulated in some cases as part of a deliberate compensation strategy. In these cases backdating has been defended as having been necessary to level the playing field between employees hired in rapid succession. Imagine that Acme Co. had a volatile stock price. It hired Andy on January 1, Beth on January 15, and Cindy on January 30, and the market price of its stock on those three dates was \$12, \$10, and \$15 per share. If Acme granted at-the-money options to its new employees on their hiring dates, Beth would have received a windfall, and Andy and Cindy would have been displeased. Of course, Acme could have

³³ See, e.g., Brocade Commc'ns Sys., Inc., Registration Statement (Form S-8), exhibit 4.1, at 4-6 (Jan. 28, 2000) [hereinafter Brocade Form S-8].

³⁴ See, e.g., *id.* at 6-8. Limitations are placed on exercise prices of options that are intended to qualify as ISOs or as performance-based pay under I.R.C. § 162(m).

³⁵ See, e.g., *id.* at 12 ("The date of grant of an Option . . . shall be . . . the date on which the Administrator makes the determination granting such Option . . . or such other later date as is determined by the Administrator."). At some firms, option grants are scheduled to occur on the same date or dates each year. Obviously, pre-committing to a grant date eliminates the potential for grant timing manipulation. As a result of the scandal, more firms are adopting this practice. See Joann S. Lublin, *Untainted Firms Alter How They Offer Options*, WALL ST. J., Dec. 11, 2006, at B1 (reporting that more than two dozen companies are estimated to have tightened option grant policies in the wake of the scandal).

³⁶ Such trickery was facilitated by a practice of approving executive option grants through soliciting written consents from the committee members, often after the fact, rather than convening a meeting of the committee to approve a grant. See *infra* note 138 and accompanying text (describing how compensation committee members at Comverse Technology were tricked into signing consent documentation for backdated options).

granted Cindy an option with a \$10 strike price on January 30 despite the prevailing \$15 market price, but that grant would have resulted in a \$5/share charge against earnings and could not have qualified as an ISO. Moreover, if Cindy were a senior executive, the expense might not have been deductible for Acme. Acme also might have promised 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 had negative accounting consequences for Acme.³⁷ Of course, Acme also could have eliminated the disparity between Andy, Beth, and Cindy by adjusting the number of shares subject to each option, but unless the number of shares were fixed on the date of the grant, Acme might have been required to recognize compensation expense.³⁸ Thus, without perfect foresight, Acme could not 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 have generated paperwork indicating that each employee had received an at-the-money option grant on January 15 with a strike price of \$10/share. For Cindy, this might have meant generating a spurious engagement letter dated two weeks prior to her actual hiring. For Andy, the company would have simply reported that his option was granted subsequent to hiring.

Microsoft and Micrel Inc. have admitted to utilizing an option pricing practice that was a variant of the foregoing. During periods in the late 1990s, each company set option strike prices equal to their lowest closing stock prices for the thirty days following approval of the grant.³⁹ 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

³⁷ Under the pre-2005 accounting rules for options, compensation expense was recognized to the extent that the market price of the stock on the "measurement date" exceeded the option exercise price. The "measurement date" was defined as the first date on which both the number of shares subject to the option and the exercise price were known. See APB Opinion No. 25, *supra* note 21, ¶ 10. Because the exercise price of Andy's hypothetical option would not be determined until January 31, expense would have been recognized for the option unless the market price for the company's stock on January 31 was equal to the monthly low price.

³⁸ In this scenario, a company would have recognized compensation expense to the extent that the market price of the company's stock on the date on which the number of option shares was determined exceeded the option exercise price. See *id.*

³⁹ See Eric Dash, *Inquiry into Stock Option Pricing Casts a Wide Net*, N.Y. TIMES, June 19, 2006, at C1; Charles Forelle & James Bandler, *During 1990s, Microsoft Practiced Variation of Options Backdating*, WALL ST. J., June 16, 2006, at A1; David Reilly, *Moving the Market: Micrel Says Deloitte Approved Options-Pricing Plan*, WALL ST. J., June 1, 2006, at C3.

Deloitte & Touche for signing off on this arrangement, has stated that one of its goals was to level the playing field among employees hired in rapid succession.⁴⁰ Microsoft ended this practice in 1999 after having utilized it for seven years.⁴¹

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 stock price for the month, the quarter, or even the year.⁴² The odds of grants consistently being made on periodic lows without hindsight are minuscule.⁴³ David Yermack first pointed out anomalies in executive stock option pricing in 1997.⁴⁴ 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.⁴⁵ 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.⁴⁶ 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.⁴⁷

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 2002.⁴⁸ Prior to that date, option grants received by senior executives did not have to be reported to the SEC until forty-five days after the end of the company's fiscal year.⁴⁹ Now, as a result of the Sarbanes-

⁴⁰ See Dash, *supra* note 39; Reilly, *supra* note 39.

⁴¹ See Forelle & Bandler, *supra* note 39.

⁴² See, e.g., Forelle & Bandler, *supra* note 3.

⁴³ See *id.* (reporting the odds of certain option pricing patterns occurring by chance at Affiliated Computer Services as one in 300 billion, at UnitedHealth as one in 200 million, at Brooks Automation as one in 9 million, and at Vitesse Semiconductor as one in 26 billion).

⁴⁴ See generally David Yermack, *Good Timing: CEO Stock Option Awards and Company News Announcements*, 52 J. FIN. 449 (1997).

⁴⁵ *Id.* at 470.

⁴⁶ See Steve Stecklow, *Options Study Becomes Required Reading*, WALL ST. J., May 30, 2006, at B1 (quoting Yermack as stating that he initially didn't believe the backdating explanation because "[t]he whole idea was so sinister").

⁴⁷ See Erik Lie, *On the Timing of CEO Stock Option Awards*, 51 MGMT. SCI. 802, 810 (2005).

⁴⁸ See Randall A. Heron & Erik Lie, *Does Backdating Explain the Stock Price Pattern Around Executive Stock Option Grants?*, 83 J. FIN. ECON. 271, 272 (2007).

⁴⁹ Compensatory stock option grants are exempted from the reach of the "short-swing" trading rule, Securities Exchange Act of 1934 § 16(b), 15 U.S.C. § 78p(b) (2000), by Exchange Act Rule 16b-3(d), 17 C.F.R. § 240.16b-3(d) (2006). Prior to passage of the

Oxley Act, the SEC requires options issued to executives to be reported within two business days of the receipt of the grant.⁵⁰ 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 2002.⁵¹ This proved to be true, supporting the idea that backdating, rather than amazing forecasting abilities, explained the earlier findings.⁵²

A second Heron and Lie study attempts to quantify the extent of the backdating phenomenon. This study estimates that 16% of purported at-the-money options granted to senior executives between 1996 and 2005 were backdated or otherwise manipulated.⁵³

Lucian Bebchuk, Yaniv Grinstein, and Urs Peyer have recently produced a novel analysis of CEO option grants that provides further evidence of widespread manipulation. The trio found that the strike prices of option grants were much more likely to be set equal to the first, second, or third lowest stock prices of the month (and less likely to be set equal to the highest prices) than random assignment of grant dates would suggest.⁵⁴ Their analysis indicates that between 1996 and 2005, about 6% of CEO option grants were manipulated to achieve strike prices equal to the lowest price of the month, and 9% were manipulated to achieve one of the three lowest prices.⁵⁵ Although the authors found that manipulation was somewhat more likely to have occurred at new economy firms, their data indicate that manipulation was rampant at old economy firms as well.⁵⁶

As of this writing, over one hundred public companies have been subjected to SEC investigation relating to stock option pricing, investigations continue with respect to about ninety cases,⁵⁷ and criminal and/or civil charges have

Sarbanes-Oxley Act, these exempted transactions were excluded from Form 4 filing requirements and were instead required to be reported annually on Form 5. *See* Exchange Act Rule 16a-3(f)-(g), 17 C.F.R. § 240.16a-3(f)-(g) (2001) (amended 2002).

⁵⁰ *See* Exchange Act Rule 16a-3(g)(1), 17 C.F.R. § 240.16a-3(g)(1) (2006) (requiring Form 4 reporting of “transactions exempt from section 16(b) of the Act pursuant to § 240.16b-3(d)”).

⁵¹ Heron & Lie, *supra* note 48, at 273.

⁵² *See id.* at 294.

⁵³ Heron & Lie, *supra* note 2, at 11. The authors found 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 before the two-day filing requirement took effect. *Id.* at 12-13.

⁵⁴ Bebchuk et al., *supra* note 2, at 13-18. The authors found a monotonic relationship between the likelihood that a date was selected as the grant date and the relative price on that date; in other words, the lowest price of the month was mostly likely to be selected, the second lowest was the second most likely to be selected, and so on. *Id.* at 14-15.

⁵⁵ *Id.* at 16-17.

⁵⁶ *Id.* at 30.

⁵⁷ *See Perfect Payday*, *supra* note 1.

been filed against executives of Brocade Communications Systems,⁵⁸ Comverse Technology,⁵⁹ and four other companies.⁶⁰ Thus far, eighty-two firms have restated their financials to properly account for backdated option grants or announced plans to do so.⁶¹ Executives at thirty-three firms have departed in the wake of the scandals.⁶²

3. Tax and Accounting Consequences of Revealed 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 2002.⁶³ Brocade's average stock price for January 2002 was \$36.56.⁶⁴ 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 of its stock was around \$36/share. 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 in its fiscal year 2002 financial statements.⁶⁵ Brocade will now be required to amend its 2002 income statement and report an expense in excess of \$20 million for this set of option grants alone.⁶⁶ 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

⁵⁸ See Forelle et al., *supra* note 11.

⁵⁹ See Charles Forelle & James Bandler, *Dating Game: Stock-Options Criminal Charge*, WALL ST. J., Aug. 10, 2006, at A1.

⁶⁰ See Steve Stecklow, *Options Trial Could Set Path of Future Cases*, WALL ST. J., June 18, 2007, at C1.

⁶¹ See *Perfect Payday*, *supra* note 1.

⁶² See *id.*

⁶³ See Brocade Complaint, *supra* note 11, at 12.

⁶⁴ Unless otherwise indicated, Standard & Poor's Compustat database is the source of all stock prices used in this Article.

⁶⁵ See Brocade Complaint, *supra* note 11, at 5. Because Brocade's 2001 fiscal year ended on Saturday, October 27, any compensation expense associated with an October 30, 2001, option grant would be included in Brocade's 2002 fiscal year financial statements. See *id.* at 4.

⁶⁶ 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 the 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 21, ¶ 10.

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.⁶⁷ Third, to the extent that certain 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).⁶⁸

C. *Some Preliminary Empirical Observations*

Given the still-unfolding nature of this scandal, any empirical observations made today are necessarily preliminary, but comparing identified backdaters to their peers may provide some insight into the phenomenon. Two recent studies suggest that option manipulation was quite widespread and that the hundred companies currently under SEC investigation represent only a small fraction of the offenders.⁶⁹ However, it is reasonable to assume that the first firms to be investigated were some of the most aggressive participants. Thus, comparing these firms with their peers should at least tell us something about aggressive backdaters.

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, option use ran more broadly or deeply at identified backdating firms within the semiconductor industry than at peer firms – the total value of options granted company-wide was substantially larger at backdating firms, even after adjusting for employment. Fourth, firms within the semiconductor industry that currently are and are not under investigation do not differ noticeably in size, employment growth, stock price volatility, or management entrenchment.

1. A Technology Sector Phenomenon?

By my count, at least 70% of the firms subjected to SEC investigation for backdating options through mid-June 2007 are properly labeled as “high technology” companies, but the proportion would be even higher if one

⁶⁷ See I.R.C. § 83(h) (2000). Depending on Brocade’s tax status, this may be an advantageous tradeoff, 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, 735-36 (2004).

⁶⁸ During the period in question, the deduction limitation pursuant to § 162(m) applied to non-performance-based pay provided to a company’s CEO and the four most highly compensated employees other than the CEO. See I.R.C. § 162(m)(3).

⁶⁹ See Bebchuk et al., *supra* note 2, at 2; Heron & Lie, *supra* note 2, at 4.

included other arguably high technology firms that do not fall within the obvious Standard Industrial Classification (SIC) technology categories, such as Monster Worldwide (parent of monster.com), which is classified as an advertising company, and Apollo Group (parent of the University of Phoenix online education system), which is classified as an educational services firm.⁷⁰ Strikingly, however, 33% of the companies subjected to investigation by the SEC through mid-June 2007 fall within just two four-digit SIC technology categories (3674, semiconductors and related devices, and 7372, prepackaged software), and 44% fall within the related three-digit SIC categories.⁷¹

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 simply as a result of the heavy reliance on option compensation in the tech sector.⁷² Moreover, Bebchuk, Grinstein, and Peyer have shown that, although manipulation of CEO option strike prices was somewhat more common at new technology companies, manipulation was still quite common at old technology firms as well.⁷³ On the other hand, both statistical and anecdotal evidence suggest 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 would be surprised if there was even one publicly traded technology firm that was not involved in backdating during the boom years.⁷⁴

2. Distribution of Options and Option Value Within Backdating Firms

The concentration of firms under investigation for backdating in SIC code 3674 (semiconductors) provides one opportunity to compare backdating firms with their non-backdating (or not yet identified as backdating) peers. I compared five years 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. The analysis was sparked by a study by Jack Ciesielski, editor of *The Analyst's*

⁷⁰ See *Perfect Payday*, *supra* note 1; Occupational Safety & Health Admin., SIC Division Structure, http://www.osha.gov/pls/imis/sic_manual.html (last visited June 12, 2007).

⁷¹ Companies subject to SEC investigation with respect to the pricing or timing of stock option grants through mid-June 2007 are listed in Appendix A.

⁷² See Gary Rivlin & Eric Dash, *Silicon Valley Was Calming Down. Now, an Options Scandal*, N.Y. TIMES, July 22, 2006, at C1.

⁷³ Bebchuk et al., *supra* note 2, at 29. We do not know the extent to which manipulation equates to backdating (as opposed to opportunistically timing grants prior to the release of good news), although the authors produce some evidence suggesting that manipulation was more likely the result of backdating. See *id.* at 18-21.

⁷⁴ See Heron & Lie, *supra* note 48, at 276 (quoting an anonymous source).

Accounting Observer, finding that 57% of the companies under investigation for backdating as of June 30, 2006, granted considerably more options to senior executives than their peers did.⁷⁵

My findings were just the opposite: within SIC code 3674, 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%.⁷⁶ 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 combined Black-Scholes value averaging about \$16.3 million per year (\$17.6 million median), while their peers received grants with average combined value of \$10 million per year (\$5.8 million median).⁷⁷

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.⁷⁸

Interestingly, backdating itself does not help explain this data. As we will see, backdating increases the actual value of options, but reduces their reported value.⁷⁹ 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 between them and 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

⁷⁵ See Gretchen Morgenson, *At the Options Buffet, Some Got a Bigger Helping*, N.Y. TIMES, July 23, 2006, § 3, at 1 (recounting Ciesielski’s findings).

⁷⁶ This difference was statistically significant at the 5% level. See *infra* app. C.

⁷⁷ This difference was not statistically significant. See *infra* app. C; see also Murphy, *supra* note 16, at 2511-15 (providing an overview of the Black-Scholes option pricing model).

⁷⁸ 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 *infra* app. C.

⁷⁹ See *infra* Part II.A, II.C.

almost three times the option compensation of her peers at non-backdating firms.⁸⁰

3. Other Differences Between Semiconductor Firms Under Investigation and Their Peers

Other potential differences between identified backdaters in the semiconductor industry and their peers were statistically insignificant and less interesting directionally. Backdating firms had smaller average revenues than their peers, but the difference was attributable to two very large firms that ultimately were eliminated from the control group, Intel and Texas Instruments.⁸¹ Growth in employment between 1998 and 2002, which one might think would contribute to pressure to backdate, was about the same between the two groups.⁸² Volatility was also comparable.⁸³ Corporate governance quality, as measured by Bebchuk, Cohen, and Ferrell's entrenchment index, was slightly better for backdating firms than their peers.⁸⁴

⁸⁰ See *infra* app. 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 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.

⁸¹ After eliminating Intel and Texas Instruments (average annual revenues of \$28.5 billion and \$9.3 billion, respectively), the average annual revenue of the control group was \$661 million, compared to \$606 million for the backdating group.

Unless otherwise indicated, the data reported in this section and similar data reported throughout this Article were acquired from Standard & Poor's Compustat database.

⁸² On average, employment among the backdating firms increased 212% between 1998 and 2002, whereas employment growth among the control firms over the same period averaged 176%. This difference was not statistically significant.

⁸³ Average annualized stock price volatility was almost identical for the two samples: 86% for the backdating firms and 83% for the control group. This difference was not statistically significant.

The volatility figures used throughout this Article refer to the standard deviation of continuously compounded returns, expressed as an annual percentage.

⁸⁴ See Lucian Bebchuk et al., *What Matters in Corporate Governance?* 14, 39 tbl.1 (John M. Olin Ctr. for Law, Econ. & Bus., Discussion Paper No. 491, 2004), available at http://www.law.harvard.edu/programs/olin_center/papers/pdf/Bebchuk_et%20a1_491.pdf.

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. *Id.* at 33.

II. ANALYSIS OF EXECUTIVE STOCK OPTION BACKDATING

The core of this Part is an economic analysis of backdating, focusing on the effect of the practice on the value conferred on executives who received backdated options and on the level of executive compensation reported to investors.⁸⁵ The underlying assumption of this analysis is that backdating “worked.” It assumes, in other words, that decision makers thought either that backdating was permissible or that the practice was unlikely to be discovered, and thus the effects on reported and realized compensation would be lasting.

Perhaps because option valuation is complex, press reports generally have focused either on the strike price “discounts” achieved through backdating or on the size of the earnings restatements required once backdating was discovered.⁸⁶ However, as we will see, those figures are only loosely related to the incremental value of backdating to option recipients and to the reporting gap.

There are at least three reasons to carefully consider the relationship between backdating and the value conferred on option recipients. First, although one may question whether option recipients actually calculated the value boost from backdating, understanding the magnitude of the potential gains may assist in assessing motivation. Second, a 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.⁸⁷ Third, as litigation over backdating mounts, it will be helpful to understand how much the actors actually gained as a result.

Understanding the effect of backdating on the level of executive compensation disclosed to investors is important for obvious reasons. The grant date values of options conferred on company CEOs and certain other senior executives that are prominently disclosed in company proxy statements are widely used in making peer-to-peer pay comparisons. As we will see near the end of this Part, the effect of backdating on reported option value and actual option value may have been interrelated in some cases, as low reported values may have caused some companies to increase the size of option grants to achieve a value target for option compensation. This Part begins, however,

Bebchuk, Grinstein, and Peyer analyzed a large number of CEO options granted between 1996 and 2006 and found that strike price manipulation was more likely to occur when the company did not have a majority of independent directors on its board and when the CEO had a longer tenure. Bebhuk et al., *supra* note 2, at 24-26. Both factors are associated with CEO control over the executive pay-setting process. *Id.*

⁸⁵ Most of the analysis in this Part applies equally to backdated options received by non-executive employees. However, there are sufficient differences to warrant separate consideration of that case in Part III.

⁸⁶ See, e.g., Forelle & Bandler, *supra* note 3.

⁸⁷ Heron & Lie, *supra* note 2, at 3-4.

with an analysis of the impact of backdating on the value of an option share, the effect of stock volatility on the value boost from backdating, and the impact of backdating on reported option compensation. This Part concludes by considering two related questions: Did executives “pay” for backdated options through reductions in other forms of compensation? What factors beyond the pure economics of backdating may have influenced its occurrence?

A. *The Backdating Boost Per Share Is a Small Fraction of Strike Price “Discount”*

Contrary to the apparent assumption of most press 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 a small fraction of that amount.⁸⁸ Thus, backdating an option on a fixed number of shares was much less valuable than one would imagine. In order to understand the intuition behind this assertion, consider the Brocade Communications example discussed above. Brocade effectively reduced option strike prices from about \$36/share to \$24/share. 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, may be the most likely outcome for Brocade’s optionees, although no one could have known this in January of 2002.⁸⁹ A final possibility is that the backdated options would be exercised when the stock price was between \$24 and \$36 per share, resulting in ex post backdating value between \$0 and \$12 per share.

It is clear from this example that the expected ex post value of backdating, and hence the ex ante value, 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 somewhat controversial.⁹⁰ Because compensatory options cannot be transferred and are not immediately exercisable (unlike traded options), the Black-Scholes model overstates the value of these

⁸⁸ Most press reports have focused on the strike price discounts achieved through backdating or on earnings restatements, which are equivalent. See, e.g., Forelle & Bandler, *supra* note 3. However, there are exceptions. See, e.g., Roger Parloff, *Backdating: A Little Less Than Meets the Eye*, FORTUNE: LEGAL PAD, http://money.cnn.com/blogs/legalpad/2006_10_01_archive.html (Oct. 31, 2006, 06:44 EST) (analyzing the impact of backdating on the Black-Scholes values of options).

⁸⁹ Brocade’s options dated October 30, 2001, would not have become exercisable prior to October 30, 2002. See Brocade Form S-8, *supra* note 33, exhibit 4.1, at 17. Brocade’s stock has not closed above \$24/share since May 14, 2002. The stock closed at \$8.51/share on June 12, 2007.

⁹⁰ See Murphy, *supra* note 16, at 2511-13.

options.⁹¹ 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.⁹² The model is particularly sensitive to volatility and duration.⁹³ 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 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.

To see these effects more concretely, we can calculate the impact of backdating on the value of the hypothetical option issued by Tech Inc., using assumptions for stock volatility and option duration that would be typical for technology companies during the period in which backdating apparently was concentrated. In my analysis, I use 80% volatility, which is the average volatility of the semiconductor stocks listed in Appendix B over the 1998 to 2002 period.

As for option duration, compensatory stock options typically expire ten years from the date of grant. However, recipients of these options rarely hold them until expiration.⁹⁴ The "tweak" that is required in applying the Black-Scholes model to compensatory options is to substitute the expected life of an

⁹¹ *See id.*

⁹² *See* RICHARD A. BREALEY ET AL., *PRINCIPLES OF CORPORATE FINANCE* 577 (8th ed. 2006). One reason the value boost from backdating is less than the strike price discount is time value. Even if an option were certain to be exercised, the value at grant of a strike price reduction that would be enjoyed several years hence is less than the nominal amount of the discount. *See id.* at 16.

⁹³ *See id.* at 576-77.

⁹⁴ Market traded options are rarely exercised prior to expiration, because the value of an option always exceeds the option's intrinsic value (the difference between the market price of the underlying asset and the option exercise price). Thus, prior to expiration, an option holder can sell the option for more than the gain she would derive from exercise (assuming there is no difference in transaction costs). *See id.* at 582. Compensatory options, however, cannot be sold or otherwise transferred, and the recipients of these options bear a great deal of firm-specific risk. For both of these reasons, compensatory options typically are cashed out well before exercise, often forgoing significant value. *See* J. Carr Bettis et al., *The Cost of Employee Stock Options* 3 (Mar. 2003) (unpublished manuscript), available at <http://ssrn.com/abstract=376440>.

option, the period between grant and the expected date of exercise, for the contractual life of the option. Firms estimate and disclose the average expected life of options they grant each year.⁹⁵ A review of filings of the semiconductor firms listed in Appendix B reveals average expected option lives ranging from about three to six years, with most firms reporting lives of four to five years. These weighted average values include both executive and non-executive grants, and executives typically hold options longer than non-executives.⁹⁶ Thus, I will use a five year expected life for this hypothetical.

First, assume that Tech grants an at-the-money option to an executive on March 15 when its stock is trading at \$50/share. Under these assumptions (80% volatility and five year expected life), the value of that option is computed to be \$32.82/share.⁹⁷ Now suppose that the Tech option is backdated to February 15, when the stock closed at \$40/share. The market price of the stock on the actual date of the grant is still \$50/share, but the backdated option has an exercise price of \$40/share. Backdating effectively causes the option to be \$10/share in the money. Reducing the strike price but maintaining all the other assumptions results in a Black-Scholes value of \$34.77/share. The increase in expected value is only \$1.95/share, or less than twenty cents for each dollar reduction in strike price. Put another way, a 20% reduction in the strike price of this hypothetical option increased the expected value by only 6%. 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 five year expected life, the value boost from backdating this option falls to less than 2.5%.⁹⁸

⁹⁵ Weighted average expected option life typically is disclosed in the footnotes to firms' annual financial statements. *See, e.g.*, Analog Devices, Inc., Annual Report (Form 10-K), Exhibit 13.2, at 20 (Jan. 26, 2001) (disclosing that the weighted average expected lives of options granted in fiscal years 1998, 1999, and 2000 were 6.1 years, 6.1 years, and 4.9 years).

⁹⁶ *See* Bettis et al., *supra* note 94, at 19 (finding that CEOs tend to hold onto options longer than lower-level firm executives).

⁹⁷ All Black-Scholes values reported in this article were determined using an online calculator available at <http://www.option-price.com>. A 3% risk-free interest rate is assumed throughout. The presence of dividends complicates the Black-Scholes analysis. I assume throughout that there are no dividends, which is a reasonable assumption for young technology companies.

One can get a sense of the value forgone through early exercise by rerunning the Black-Scholes analysis using the ten year contractual option life instead of the five year expected life. The option value increases to \$41.18/share. The difference of over \$8/share reflects the riskiness of holding options on the stock of one's employer and the value of liquidity.

⁹⁸ 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 highly volatile stocks.

Of course, the 20% reduction in strike price used in this hypothetical is arbitrary, and naturally the value boost from backdating increases with the strike price discount. Unfortunately, we have little data on the discounts achieved through backdating. Brocade optionees obtained a discount of about one-third on options purportedly granted on October 30, 2001, but this appears to be a fairly extreme example. Bebchuk, Grinstein, and Peyer found that the average difference between the strike price of CEO options purportedly granted on the lowest priced day of the month and the median stock price for that month was 12%, which gives us a rough idea of the magnitude of strike price discounts achieved through backdating.⁹⁹ In any event, the analysis herein does not purport to demonstrate that the incremental value of backdated options was inconsequential, only that the value boost from backdating options on highly volatile stocks was a relatively small fraction of the strike price discounts achieved.¹⁰⁰

I have made one simplifying assumption that, if relaxed, would marginally increase the value of backdating. Assuming that vesting periods were not adjusted, backdating an option by a month effectively accelerates vesting by a month, which would be valuable to a risk averse option recipient. I have not attempted to factor accelerated vesting into my analysis, but anecdotal evidence suggests that in most cases backdating was limited to several months or less. The impact of accelerating vesting by a month or two would not be significant. Of course, backdating an option to create a grant that is well in the money and providing for immediate vesting would be very valuable to the recipient. However, I have read of only one case thus far in which backdating was combined with immediate vesting. See Forelle & Bandler, *supra* note 60 (describing a backdated option grant with immediate vesting made by Converse Technology to a disgruntled executive).

⁹⁹ See Bebchuk et al., *supra* note 2, at 17. This figure could over- or under-estimate the average strike price discount from backdating. On the one hand, the authors show that it was more likely that options actually issued on monthly highs were backdated than options issued on monthly averages, and in some cases firms apparently looked back beyond the month in backdating options. See *id.* at 1. On the other hand, not all backdaters were so aggressive as to select the date of the monthly low price as the purported grant date. The difference between the strike price of CEO options purportedly granted on the second lowest priced day of the month and the median stock price for that month was 8%. See *id.* at 49 tbl.6.

¹⁰⁰ The 20% strike price discount used in the Tech Inc. hypothetical is roughly supported by the analysis of Professors M.P. Narayanan, Cindy Schipani, and Nejat Seyhun, who have attempted to quantify the incremental value conferred on option recipients as a result of backdating. M.P. Narayanan et al., *The Economic Impact of Backdating of Executive Stock Options*, 105 MICH. L. REV. (forthcoming June 2007) (manuscript at 42-45), available at <http://www.bus.umich.edu/NewsRoom/pdf/backdating082006.pdf>. By examining stock price patterns over a period ranging from five to ninety days following purported option grant dates and assuming that backdating occurred when it would have been profitable, the trio calculate an upper bound on the potential benefit from backdating during the pre-SOX era as 1.25% to 3.66% of the grant value of options. *Id.* at 58 tbl.4. Because the authors used contractual option life instead of expected life in calculating values, this data is roughly consistent with the results of the Tech Inc. hypothetical based on contractual option life. In

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 the frequency of backdating.¹⁰¹ This result is surprising if option grants are based on a fixed number of shares. High 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 strike price 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 Tech Inc. numbers, but assume 40% volatility instead of 80%, the expected gain from backdating increases from \$1.95/share to \$3.76/share.¹⁰² Why does higher volatility dampen the value boost from backdating? The reason, in short, is that a “head start” given on an option on a non-volatile stock is more likely to persist until vesting and exercise than an equal “head start” given on an option on a volatile stock.¹⁰³

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.¹⁰⁴ This is not surprising. If a significant fraction of

subsequent versions of their paper, the authors plan to recalculate values under a more realistic assumption regarding expected option life. E-mail from Nejat Seyhun, Professor of Bus. Admin., Univ. of Mich. Ross Sch. of Bus., to author (Oct. 25, 2006, 13:25 EST) (on file with author). The impact will be to increase the value boost from backdating consistent with the Tech Inc. analysis.

¹⁰¹ Heron & Lie, *supra* note 2, at 3.

¹⁰² For further discussion of the diminished value boost from backdating associated with increased stock volatility, see Martin Dierker & Thomas Hemmer, *On the Benefits of Backdating* 9-10 (Mar. 14, 2007) (unpublished manuscript), available at <http://ssrn.com/abstract=960286>.

While informative, the Tech Inc. example provided above 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.

¹⁰³ 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.

¹⁰⁴ See Bettis et al., *supra* note 94, at 16, 49 tbl.3 (studying a sample of 100,000 option exercises at over 3000 companies and reporting that, on average, employees of companies in the highest volatility quintile exercised options over a year earlier than employees of companies in the lowest volatility quintile).

an employee's compensation is comprised of options, that employee bears a great deal of firm-specific risk. The more volatile the stock of the employer, the greater the risk. All else being equal, we should expect holders of compensatory options on highly volatile stocks to exercise relatively quickly following vesting.¹⁰⁵ 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.

It is difficult to predict as a theoretical matter how these three effects balance, 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 lowest closing price of the month.¹⁰⁶ 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% and 40%; Intel, 54% and 59%; and Analog Devices, 70% and 74%.¹⁰⁷ 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 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 for more mature firms.¹⁰⁸ 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

¹⁰⁵ See *id.* at 12.

¹⁰⁶ Forelle & Bandler, *supra* note 39.

¹⁰⁷ Actual volatilities during the periods at issue were comparable.

¹⁰⁸ See Jennifer N. Carpenter, *The Exercise and Valuation of Executive Stock Options*, 48 J. FIN. ECON. 127, 138, 139 tbl.1 (1998) (analyzing option exercises at forty firms from 1979 to 1994 and finding that the average option was exercised 5.8 years after grant (6.1 years median)); Bettis et al., *supra* note 94, at 48 tbl.2 (finding for their large sample that the number of years between option vesting and exercise averaged 2.4 (1.8 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.

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 the benefit of backdating, 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 the Black-Scholes value. In this example, the benefit of backdating the low-volatility IBM option was almost twice that of backdating the high-volatility 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 of 5.3 years for its options granted in 2001 and 5.2 years for options granted in 2002.¹⁰⁹ 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%. The effects of volatility on average strike price discounts and backdating benefit using the "Microsoft" approach are portrayed graphically in the figure below.

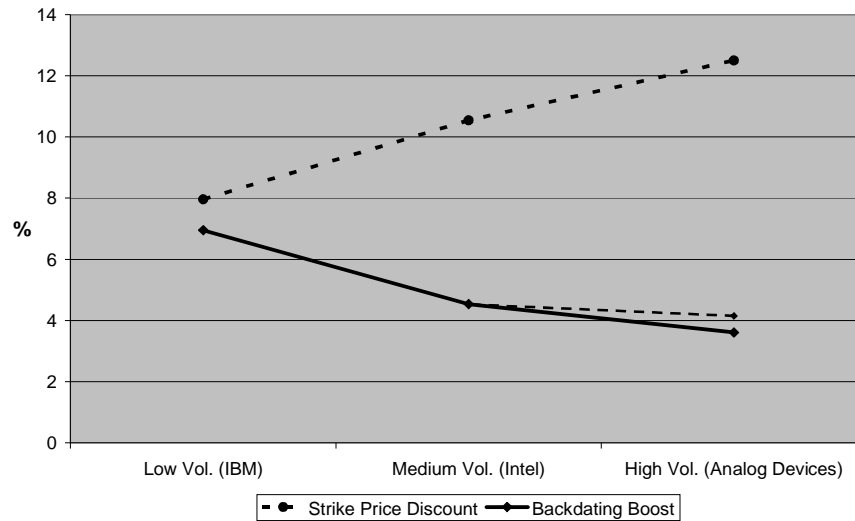
For this selected sample of companies, at least, the primary effect of high stock price volatility is to dampen the expected per share value boost that is associated with discounting an option's strike price. This effect more than offsets the effect of volatility on the expected strike price discount and on the expected life of the option. Thus, whether a company is looking back over a quarter, a month, or a week,¹¹⁰ backdating apparently holds less promise for

¹⁰⁹ Analog Devices, Inc., Annual Report (Form 10-K), at 57 (Jan. 29, 2003).

¹¹⁰ Backdating at Brocade Communications allegedly ranged between a quarter and a week. See Brocade Complaint, *supra* note 11, at 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 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

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.¹¹¹

Figure 1. Volatility and Backdating Benefit¹¹²



C. *Backdating Resulted in Significantly Underreported Option Compensation*

The analysis to this point has focused on the impact of backdating on the value of an option share. If one assumes that backdating had no impact on the size of option grants (or on other compensation), the benefit enjoyed by option

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. For Analog Devices, the average discount was over 24%, but the average backdating benefit increased to only 7.57%, assuming six year average option life (8.92% assuming five year average life).

¹¹¹ Heron & Lie, *supra* note 2, at 3. Bebchuk, Grinstein, and Peyer find that firms were more likely to grant options at the lowest price of the month when the spread between the lowest price and median price was greatest. Bebchuk et al., *supra* note 2, at 23. This evidence, which the authors view as suggesting that manipulation was opportunistic rather than routine, is consistent with the foregoing analysis. All else being equal, including volatility, the larger the strike price discount, the larger the expected payoff from backdating.

¹¹² In the graphic, the solid line represents the value boost from backdating assuming a six year expected life for all options. The dashed line departing from the solid line reflects an alternative assumption of a five year expected life for the Analog Devices options.

recipients would have exactly equaled the incremental option value. Of course, the assumption that grant size was unaffected must be examined, but before doing so, it will be helpful to first consider the impact of backdating on the level of option compensation, particularly executive option compensation, reported to investors.

Backdating resulted in significant understatement of the value of executive stock options in corporate proxy statements.¹¹³ Consider, for example, another 2001 Brocade option grant. The company's CEO, Gregory Reyes, and his senior executive team received options dated October 1, 2001, carrying a strike price of \$12.90/share, which was the stock's closing price for that date.¹¹⁴ Reyes' option covered 1,262,113 shares.¹¹⁵ It turns out that \$12.90/share was the lowest closing price for the year. A week later the stock closed above \$20/share, and a month later it closed at \$25.92/share. By December, the stock was trading above \$30/share. It is safe to conclude that the purported October 1 grant was backdated.

This grant was disclosed to investors in Brocade's 2002 proxy statement in a table captioned "Option Grants in Last Fiscal Year."¹¹⁶ The content and format of this disclosure were tightly specified by SEC regulations.¹¹⁷ Accordingly, the table describes the details of this grant (and others), including the number of shares covered by the option, the exercise price, and the option expiration date.¹¹⁸ The table also discloses two "potential realizable values" for this award – \$10.2 million and \$25.9 million – based on SEC-prescribed assumptions of 5% and 10% annual stock price appreciation between the dates of grant and expiration.¹¹⁹ But these calculations were based on an apparently false representation that the market price of the company's stock on the date of

¹¹³ Media reports have focused on the effect of backdating on reported earnings, but in terms of compensation disclosure, earnings reports were irrelevant. Because options granted at the money did not result in a charge against earnings, and almost all options were granted (truly or fictitiously) at the money, earnings statements prior to 2005 told us nothing about the level of option compensation. Proxy statements were where the action was in terms of executive option compensation disclosure.

¹¹⁴ Brocade Commc'ns Sys., Inc., Proxy Statement (Schedule 14A), at 18 (Feb. 25, 2002) [hereinafter Brocade Proxy Statement].

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ See SEC Reg. S-K, 17 C.F.R. § 229.402 (2006).

¹¹⁸ Brocade Proxy Statement, *supra* note 114, at 18. Regulation S-K requires disclosure of the expiration date, not the grant date. 17 C.F.R. § 229.402(f)(2)(vi). However, since most options expire ten years from the date of grant, one can easily infer the grant date from the required disclosure.

¹¹⁹ See Brocade Proxy Statement, *supra* note 114, at 18. Given a ten year option life, the formula for calculating the "potential realizable value" under a 5% annual stock price appreciation assumption is as follows: $1,262,113 \times [12.90(1.05)^{10} - 12.90]$. See 17 C.F.R. § 229.402(c)(2)(vi).

the grant was only \$12.90/share, and thus they massively understated the value of Reyes' option.¹²⁰

Assume, for the sake of illustration, that this option was backdated by a month and was actually granted on November 1, 2001. On that date, Brocade's stock closed at \$25.92/share. Assuming 5% and 10% appreciation from a starting point of \$25.92/share instead of \$12.90/share results in potential values for an option with a \$12.90/share strike price of \$37 million and \$69 million.¹²¹

Although it is almost certain that Brocade's nominal October 1, 2001, option grants were backdated, we do not know the level of the company's stock price on the actual date of the grant. But it would not be surprising to find that purporting to grant these options on October 1 slashed the "potential realizable values" reported to investors by two-thirds or more.

However, the 5% and 10% appreciation calculations provide only a rough indicator of option value. Among other problems, this approach fails to take company-specific stock price volatility into account. Thus, most analysts would have focused on the Black-Scholes value of Reyes' option. Standard & Poor's widely utilized ExecuComp database reports a Black-Scholes value for this particular option of \$13.2 million.¹²² Of course, ExecuComp's calculation of option value is also based on the erroneous assumption that Reyes' option was issued at the money – that both the option strike price and the market price of the company's stock on the date of grant were \$12.90/share. Assuming again that this option was backdated by a month and issued when the company's stock price was \$25.92/share, the actual Black-Scholes value of this option would have been \$28.4 million.¹²³ Backdating these options easily reduced reported Black-Scholes values by 50%.

To be sure, this Brocade example is quite extreme and is driven by opportunistic bookkeeping and an unusual dip in stock price on October 1, 2001. However, the effect of backdating on the option compensation that would have been reported in our more typical Tech Inc. hypothetical is also

¹²⁰ Regulation S-K requires companies granting options in the money to also report the option's inherent value as of the grant date. 17 C.F.R. § 229.402(c)(2)(vi). Because Brocade purported to have granted these options at the money on October 1, 2001, they did not include this additional information.

¹²¹ The potential value based on 5% appreciation is calculated as follows: $1,262,113 \times [25.92(1.05)^{10} - 12.90]$.

¹²² Standard & Poor's makes the ExecuComp database available by subscription. The data can also be accessed through Wharton Research Data Services, which is available to the faculty of many academic institutions. ExecuComp utilizes a modified Black-Scholes methodology that assumes an option life equal to 70% of contractual life and reduces exceptionally high volatilities to the 95th percentile of the volatilities of all stocks in their database. Other analysts might have produced slightly different values depending on their assumptions about the expected life of the option, volatilities, etc.

¹²³ The remaining ExecuComp assumptions are maintained or estimated, i.e., option life equal to 70% of contractual life and volatility equal to 94%.

quite dramatic. Our assumptions in that hypothetical were a 20% reduction in strike price from the \$50/share market price of the stock, 80% volatility, and a five year expected life. We found that as a result of being \$10/share in the money, the Black-Scholes value of the backdated option was \$34.77/share. But the option was purportedly granted at the money, i.e., with both strike price and stock price on the date of the grant equal to \$40/share. The Black-Scholes value of this fictitious at-the-money option was only \$26.25/share. Backdating would have reduced the reported Black-Scholes value of this option by 25%.

In many cases, backdating would have resulted in significantly understated compensation. These understatements are driven by the fact that the apparent values of backdated options, which were purportedly granted at the money, are much lower than the options' actual values. Analyses that focus on the modest difference between the actual value of backdated options and the value of an at-the-money option issued on the actual date of grant miss the effect of backdating on disclosed compensation.

D. *Overall Benefit Depends on Whether Backdating Affected the Size of Option Grants*

We cannot determine the benefit of backdating to option recipients without considering the effect, if any, on the size of option grants – the number of shares covered by a particular option. The foregoing analysis suggests that by reducing the apparent value of options, backdating may have resulted in larger grants.

Most commentators and analysts, including Bebchuk, Grinstein, and Peyer,¹²⁴ and Narayanan, Schipani, and Seyhun,¹²⁵ have assumed, explicitly or implicitly, that backdating had no effect on the size of option grants. Some commentators, however, including the editors of *The Wall Street Journal*,¹²⁶ Holman Jenkins,¹²⁷ and several law professors,¹²⁸ have suggested that firms may have reduced the size of option grants to reflect the value boost from

¹²⁴ Bebchuk et al., *supra* note 2.

¹²⁵ Narayanan et al., *supra* note 100.

¹²⁶ Editorial, *Backdating to the Future*, WALL ST. J., Oct. 12, 2006, at A18 (“[O]ther things being equal, granting options at a lower price allows the company to issue fewer options.”).

¹²⁷ Holman W. Jenkins Jr., Op-Ed., *The ‘Backdating’ Witch Hunt*, WALL ST. J., June 21, 2006, at A13 (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).

¹²⁸ See, e.g., Posting of Geoffrey Manne & Josh Wright to Truth on the Market, <http://www.truthonthemarket.com/2006/09/03/no-matt-executive-compensation-is-not-all-about-norms> (Sept. 3, 2006, 15:50 EST) (suggesting that backdated options might have been an efficient form of compensation); Larry E. Ribstein, *The Other (Non-Tabloid) Side of Backdating*, IDEOBLOG, http://busmovie.typepad.com/ideoblog/2006/08/the_other_nonta.html (Aug. 16, 2006, 06:35 CST) (same).

backdating. The idea is simple. If the members of the compensation committee of Acme realize that the backdated option they are granting their CEO has a value that is 5% greater per share than a conventional at-the-money option, the committee presumably would reduce the number of shares covered by the option by 5%. In such a case, the option recipient would receive no (or little) benefit as a result of backdating.¹²⁹ However, as discussed below, I am skeptical that such adjustments were common, at least among the firms presently under SEC investigation for suspicious option-granting practices.

A third possibility is that backdating may have resulted in an *increase* in the size of option grants at some firms. At many companies, executive stock option grants are based on value rather than some fixed number of shares.¹³⁰ At these companies, the analysis begins with a determination of the value the company wishes to confer in the form of options and then follows with a calculation of the number of option shares necessary to deliver that value. As we have just seen, in the typical case, backdating resulted in a significant reduction in the apparent value of an option share. As a result, a compensation committee that was fooled into believing they were granting an at-the-money option with a low, backdated strike price, and utilized this price in determining option size, would have issued a much larger grant.

To make this concrete, let's return to the Tech Inc. example discussed above. Suppose that it is March 15, the current market price of the company's stock is \$50/share, and as a result of competitive benchmarking or simply negotiation, Tech's board has determined that its CEO should receive an option grant with Black-Scholes value of \$1 million. We calculated that the value of a fairly priced at-the-money option on this date (with \$50 strike and market price) was \$32.82/share. Thus, the CEO should receive an at-the-money option on 30,469 shares.¹³¹

Suppose, however, that the board is tricked into granting an option backdated to February 15, on which date the stock closed at \$40/share. We calculated a value of \$34.77/share for an option issued with a strike price of \$40/share when the market price of the stock was \$50/share. However, the board doesn't realize that it has granted a backdated, in-the-money option. It believes it granted an at-the-money option on a date on which the share price was \$40. As we have seen, the value of this fictitious option, which would have been disclosed in the company's proxy statement, would have been only

¹²⁹ Depending on risk preferences and other factors, it could be more efficient for a company to compensate its executives with fewer option shares granted in the money rather than a greater number of option shares granted at the money. See *infra* note 170 and accompanying text.

¹³⁰ See *infra* Part II.E.2.

¹³¹ \$1 million / \$32.82 per share = 30,469 shares.

\$26.25/share.¹³² If this figure is used to determine option size, a \$1 million grant now requires an option on 38,095 shares, a 25% increase.

Thus, to the extent that backdated valuations were used to determine the size of value-based option grants, backdating would have resulted in substantial increases in the size of the options granted. However, to determine the overall benefit of backdating to the recipient in such a case, we would have to combine this size effect with the per share value boost from backdating described in the previous sections. In this example, we determined that the actual value of the backdated in-the-money option was \$34.77/share. Thus, had Tech followed this approach, the total value of the nominal \$1 million grant would have been \$1.32 million.¹³³ Reducing the strike price by 20% through backdating would have increased the value of a fixed-value option grant in this case by 32%.

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 less volatile IBM options resulted in an average benefit of 15.3%, and backdating options on the more volatile Analog Devices stock boosted their value by 18.7% on average. The difference is not large and it is 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.¹³⁴

E. *Did Backdating Affect the Size of Option Grants?*

We do not know if or how backdating affected the size of particular option grants; companies are not required to disclose the method by which they arrive at specific grants, and the disclosure of overall executive compensation philosophy that is required in the proxy statement is apparently satisfied

¹³² 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 709-10 (5th ed. 2002).

¹³³ 38,095 shares x \$34.77/share = \$1,324,563.

¹³⁴ Heron & Lie, *supra* note 2, at 3-4.

through generalities.¹³⁵ However, while it is entirely possible that firms that openly and consistently set option strike prices at thirty day lows reduced grant sizes commensurately, in cases in which backdating was surreptitious, it is more likely that grants would have increased in size rather than decreased.

1. Adjusting Grant Size To Offset Added Value

As we have seen, backdating could have resulted in an increase, a decrease, or no change in the size of option grants at any particular firm. The impact at any company would depend principally on the company's practices with respect to granting options and the information available to the decision makers. Let's begin by considering the possibility that well-informed decision makers reduced option grant size to offset the value boost from backdating. Consider the systematic practice at Microsoft and Micrel of setting option strike prices equal to the lowest closing price during the thirty days following approval to make the grant.¹³⁶ We can reasonably assume that the number of shares subject to one of these options would have been fixed before the strike price was established and that strike price would not have factored into option size directly. However, it is entirely possible that these companies would have scaled back the size of such grants, knowing that strike prices generally would be advantageous.

However, these fairly innocent cases of open and institutionalized practices resulting in grants of in-the-money options to a broad spectrum of employees are not the focus of the SEC's efforts. At many or most of the hundred firms under SEC investigation, backdating apparently was surreptitious. As to these

¹³⁵ The Financial Accounting Standards Board has required detailed footnote disclosure of the *value* of options granted to all employees since 1995. *See infra* note 183 and accompanying text. This footnote disclosure was elevated to an expense against reported earnings beginning in 2005 and 2006. *See infra* Part IV.B. However, as with cash compensation, these disclosures simply tell us how much compensation was conferred; they tell us nothing about how companies arrived at the levels of compensation conferred.

Item 402 of the SEC's Regulation S-K requires detailed disclosure in the annual proxy statement regarding the compensation of a company's CEO, CFO, and the three most highly compensated executives other than the CEO and CFO. SEC Reg. S-K, 17 C.F.R. § 229.402(a)(2)-(3) (2007). The required disclosures include tabular data detailing the size and value of executive option grants, exercises, and holdings. The regulations also require a report by the board's compensation committee discussing the committee's compensation policies and "the factors and criteria upon which the CEO's compensation [for the most recently completed fiscal year] was based." *Id.* § 229.402(k)(2). However, this regulation has not been read as requiring detailed disclosure of the method (value-based vs. share-based) by which specific option grants were determined. Moreover, it is not clear that recently adopted enhanced executive compensation disclosures will require this level of disclosure. *See* Executive Compensation and Related Person Disclosure, Securities Act Release No. 33-8732A, 71 Fed. Reg. 53,158, 53,163 (Sept. 8, 2006).

¹³⁶ *See supra* note 39 and accompanying text.

firms, I have seen no evidence that non-participating directors were even aware that they were granting backdated options.¹³⁷

To the contrary, there is evidence of directors being tricked into granting backdated options. 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 backdated options while under the belief that they were approving standard at-the-money option grants.¹³⁸ 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 date A, the "as of" date, 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, corresponded with the strike price of the options.¹³⁹

Three senior executives of Affiliated Computer Services apparently employed a similar scheme in surreptitiously backdating options.¹⁴⁰ The report of the company's internal investigation into backdating concluded that aside from these three executives and one other manager, no other directors, officers,

¹³⁷ As in the case of CEO options, Bebchuk, Grinstein, and Peyer find that exercise prices of options granted to outside directors were more likely to be set equal to monthly low stock prices than random assignment of grant dates would predict. Lucian A. Bebchuk et al., *Lucky Directors* 15 (John M. Olin Ctr. for Law, Econ. & Bus., Discussion Paper No. 573, 2006), available at http://www.law.harvard.edu/programs/olin_center/papers/pdf/Bebchuk_et%20al_573.pdf. However, manipulation of the timing of director options appears to correlate with CEO option manipulation, and it is possible that the director grants, which would be small by comparison, were simply included in the general backdating event. Thus, this evidence does not demonstrate that outside directors knowingly participated in or sanctioned backdating.

The effect of knowing participation in backdating by non-managerial directors on grant size is ambiguous as well. Companies could have granted backdated options firm-wide as a means of increasing compensation efficiency; inside and outside directors may have colluded in backdating as a means of surreptitiously increasing compensation generally; or directors may have knowingly sanctioned backdating without thinking through the consequences. Only in the first case would we expect a reduction in the size of option grants to compensate for the value boost from backdating.

¹³⁸ Affidavit in Support of Arrest Warrants at 15-17, *United States v. Alexander*, No. M-06-817 (E.D.N.Y. July 31, 2006) [hereinafter *Comverse Affidavit*].

¹³⁹ *Id.*

¹⁴⁰ Press Release, Affiliated Computer Servs., ACS Concludes and Reports Results of Stock Option Investigation (Nov. 27, 2006), available at <http://www.acs-inc.com> (follow "Press Releases" hyperlink; then follow "11/27/2006" hyperlink).

or employees were aware of backdating or misdating of option documentation.¹⁴¹

It would take a fairly heroic view of market efficiency to believe that the size of option grants would have been reduced to reflect backdating in cases in which non-participating members of the compensation committee and board were unaware that backdating was occurring. Of course, the SEC's investigations are still at an early stage. We will probably find that some boards knew more than others. To the extent that boards were in the dark, however, we can safely assume that grants were not reduced as a result of backdating. In fact, it is entirely possible that some of these grants may have increased in size.

2. Fixed-Value vs. Fixed-Share Executive Stock Option Plans

In order to assess the extent to which backdating may have increased the size of grants in these cases, we need to know more about the details of option grant practice. Our focus in this section will continue to be on options received by company executives, who typically receive stock options under multiyear plans. These plans are described as value-based, share-based, or a combination of the two. Option value plays a role in all of these plans, but more directly in a value-based or fixed-value plan. As described above, firms utilizing fixed-value plans "back into" the number of shares subject to an option by dividing the total value to be conferred by the value of each option share. By contrast, in a share-based or 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.¹⁴² The Black-Scholes value of a specific option grant at some point into a multiyear plan would have no bearing on the size of the grant.¹⁴³ Thus, backdating had the potential to increase grant size only with respect to fixed-value option grants.

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.¹⁴⁴ For the largest companies, the ratio was closer to fifty-fifty.¹⁴⁵ Similarly, Brian Hall analyzed CEO compensation at large companies

¹⁴¹ *Id.*

¹⁴² See Murphy, *supra* note 16, at 2515.

¹⁴³ Suppose that on 10/1/06 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 10/1/06, 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.

¹⁴⁴ See Brian J. Hall, *The Design of Multi-Year Stock Option Plans*, J. APPLIED CORP. FIN., Summer 1999, at 97, 102 n.8.

¹⁴⁵ See *id.* Kevin Murphy interpreted the results of the survey slightly differently. According to Murphy, 40% of large company respondents granted options on a fixed-value

from 1980 to 1994 and concluded that less than 40% of the companies studied utilized fixed-share option plans.¹⁴⁶

Conversations with compensation consultants suggest that in recent years executive option grants have generally been value-based. In one consultant's experience, the process is not formulaic. Instead, the firm's external compensation consultant first suggests a range for the value to be conferred on an executive via options. This range is based on a variety of factors, including the value of options granted to comparable executives at comparable companies. Second, the compensation committee determines the final value to be conferred via options. The number of shares to be covered by the option is then estimated using an option pricing model. Finally, the number of shares actually covered by the option may be adjusted and rounded by the compensation committee.¹⁴⁷

This evidence suggests that fixed-value plans are common and produce many of the executive option grants arising from multiyear plans. However, not all executive option grants spring from multiyear 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. 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 executives to take 50% of their annual bonuses in the form of stock options.¹⁴⁸ These 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 received by the Black-Scholes value of the options.¹⁴⁹

basis, 40% on a fixed-share basis, and the remainder used a variety of other methods. Murphy, *supra* note 16, at 2515.

¹⁴⁶ See Hall, *supra* note 144, at 102 (classifying 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).

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.

¹⁴⁷ This information is based on a telephone interview with a principal at Mercer Human Resource Consulting who asked not to be identified. The interview was conducted on September 26, 2006.

¹⁴⁸ Semtech Corp., Proxy Statement (Schedule 14A), at 13 (May 7, 2003).

¹⁴⁹ The situation with respect to options granted to rank and file employees may be very different. Again, I suspect that options granted to hire or retain key employees generally are

3. Role of Backdated Strike Prices in Establishing Fixed-Value Option Grants

Determining that an option grant is value-based does not end our inquiry, however. A low backdated strike price would not have increased the size of even a value-based option unless that price was actually used in calculating the number of shares covered by the option. Suppose that a company undertakes a two-step process in granting executive options. In the first step, the firm determines the value to be conferred and, using recent stock prices or perhaps an average stock price over some period, “backs into” the number of shares to be covered by the option and, perhaps, rounds this figure. In the second step, it selects the date of grant which establishes the strike price for the option. Backdating the grant date in this scenario to reduce the strike price would increase the value of the option modestly but would not increase the size of the grant. If, on the other hand, the determination of grant size is a single-step process utilizing the option value on the grant date, backdating would have boosted the size of the grant considerably.

At this point we are talking about fine details of compensation practice, but these details are important in determining the effect of backdating. The difference between using the backdated price to determine the size of a fixed-value grant and not doing so is stark – in our recurrent Tech Inc. example, it is the difference between a 32% and a 6% boost in overall value.¹⁵⁰ Unfortunately, although compensation consultants have told me that backdating fixed-value options may have resulted in larger grants, none could confirm actual cases. We simply do not have enough information to determine the effect of backdating on the size of particular option grants. Certainly this is a matter that the SEC should include in its investigations and that derivative suit plaintiffs should look for during discovery.

F. *Would Executives Have Been Forced To Pay for Backdated Options?*

I have argued in the last two sections that it is unlikely that surreptitiously backdated executive option grants would have been reduced in size to compensate for the increase in value. This section will more directly address the potential objection that either individual firms or the “market” would have forced optionees to pay for backdating. I will argue more generally that it is

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.” Altera Corp., Proxy Statement (Schedule 14A), at 14 (Apr. 3, 2006). 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. Analog Devices, Inc., Proxy Statement (Schedule 14A), at 23 (Feb. 8, 2006).

¹⁵⁰ See *supra* Part II.A, II.D.

unlikely that increased option values were offset by reductions in option size or in other compensation, whether backdating was surreptitious or revealed to and condoned by boards of directors.

One question is whether company boards would have made ex ante or ex post adjustments to executive compensation to offset the value boost from backdating. As discussed above, there is evidence of compensation committee members being tricked into approving grants of backdated options thinking they were approving grants at the money. At the least, such trickery resulted in executives receiving in-the-money options on a fixed number of shares; at most, it resulted in an increase in both the size and value of a fixed-value grant. Either way, the directors would have believed ex ante that the executive was receiving the level of compensation they had approved. Boards would not have made ex ante adjustments to other elements of compensation to reflect option value boosts of which they were not aware.

However, boards conceivably could have adjusted for surreptitious backdating ex post. Backdated options that ultimately were exercised would have resulted in larger payoffs for recipients.¹⁵¹ But there are several reasons to doubt that ex post pay adjustments would have offset added value transferred through backdating options.

First, some backdated options would have expired out of the money. Of course, one might argue that in these cases recipients did not gain from backdating anyway, and thus no ex post adjustment is required. But the fact that the options expired out of the money does not negate the ex ante benefit from backdating, for which no adjustment would be expected.

Second, even if a backdated option paid off for an executive, adjustment would be unlikely because of the difficulty of accurately assessing option compensation ex post and distinguishing between option payoffs attributable to excessive grants on the one hand, and success, luck, the willingness of an executive to retain options beyond their vesting dates, and the many other factors that contribute to legitimate option payoffs, on the other. Given a sufficient number of grants and sufficient time, one might eventually be able to conclude from ex post data that an executive had received excessive option compensation, but the noisiness of option payoffs, particularly with respect to highly volatile stocks, renders ex post assessment relatively uninformative. For these reasons, the SEC, analysts, investors, and compensation committees focus primarily on the grant date value of option compensation in determining the overall value of an executive's pay package and in making peer-to-peer comparisons.¹⁵²

¹⁵¹ Assuming that backdating resulted in a reduced strike price, the gain from exercise would always exceed the gain that would have been realized on an option issued at the money.

¹⁵² See SFAS 123 (1995), *supra* note 12, ¶ 108 (reporting that employers and compensation consultants use grant date option values in determining the total value of compensation packages); *see also* Executive Compensation and Related Person Disclosure,

This is not to suggest that boards fail to take previous option grants into account when making new grants. Some companies have concluded that, as a result of previous stock and option grants, an executive's existing exposure to company stock price is adequate and additional grants would do little to further align incentives.¹⁵³ In such cases, the board may curtail equity grants or replace them with additional cash compensation. To the extent that backdating fixed-value option grants resulted in larger grants, the additional shares covered by options could result in an executive reaching option "saturation" more quickly than she otherwise would. On the other hand, unless a company imposes restrictions on option exercise or share ownership post-vesting, reduced exercise prices achieved through backdating would facilitate early profitable exercise, which would reduce an executive's stock price exposure and possibly entice the board to grant more options. Thus, it is not clear whether this practice, which is far from universal in any event, would tend to help or hurt the recipient of backdated options.¹⁵⁴

To the extent that boards were aware of backdating but disinclined to reduce grant size accordingly,¹⁵⁵ a related question is whether the "market" would

Securities Act Release No. 33-8732A, 71 Fed. Reg. 53,158, 53,163, 53,169 (Sept. 8, 2006) (asserting that disclosure of grant date value of options gives shareholders an "accurate picture" of value and calling the Summary Compensation Table, which includes grant date option value, the "principal disclosure vehicle" for executive compensation); Executive Compensation Disclosure, Securities Act Release No. 33-8765, 71 Fed. Reg. 78,338, 78,339 (Dec. 29, 2006) (amending previously announced disclosure rules by requiring that the Summary Compensation Table list a pro rata portion of option grant date value but requiring that the full grant date fair value of option awards be disclosed in a separate table).

¹⁵³ See, e.g., Herb Greenberg, *Seeking Out Firms That Don't Bother with Stock Options*, WALL ST. J., Aug. 26, 2006, at B4 (pointing to CompuCredit as an example of a company that ended executive stock option grants because the existing equity holdings of executives provided effective performance incentives).

¹⁵⁴ Not only is it unlikely that executives were forced to pay for the value boost achieved through surreptitious backdating, but in the case of fixed-share grants, the depression of the apparent value of backdated options may have led to additional compensation in future periods. Consider the Tech Inc. hypothetical discussed above and assume that the company's CEO received a backdated option on 100,000 shares of stock. An option granted at the money on March 15, when the stock closed at \$50/share, would have been worth \$3.3 million and would have been reported as being worth \$3.3 million. Reducing the strike price through backdating to \$40/share results in the option being worth \$3.5 million, but being reported as worth only \$2.6 million. Assuming that the members of Tech's compensation committee were unaware of the backdating, the CEO could use the (relatively) small \$2.6 million figure in arguing for a larger option grant or other compensation in the following year. The smaller reported option compensation figure would reduce the CEO's reported pay relative to that of her peers and provide ammunition for these negotiations.

¹⁵⁵ Boards may have been aware of backdating but inactive because the outside directors benefited from backdating themselves, thought of the additional value conferred as free money, or simply failed to attach importance to the event.

have penalized executives for the additional value transferred through such backdating, either by reducing the executives' compensation in subsequent jobs or by pressuring directors to reduce the compensation of current officeholders. It has been argued that despite the false representations made in company proxy statements as to the potential value of backdated executive options, companies disclosed all the information needed for savvy analysts to determine the value of backdated grants, and that as a result, the underreporting that I have highlighted was unimportant.¹⁵⁶

To be sure, equipped with the strike price, the number of shares covered by an option, and vesting and expiration dates (all of which were accurately disclosed despite backdating), an analyst could determine both the intrinsic value, if any, and the Black-Scholes value of any option at any time.

However, as in the case of ex post assessment, option values calculated during the option term but subsequent to grant provide a noisy and unsatisfactory measure of compensation, particularly for employees of companies with highly volatile stocks. For example, in the month following the purported October 1, 2001, option grant to Brocade CEO Greg Reyes, the Black-Scholes value of his option ranged from a low of \$13 million to a high of \$29 million.¹⁵⁷ Given the volatility of tech company stock prices as well as the fact that (prior to Sarbanes-Oxley) option grants did not have to be reported until forty-five days after the end of the company's fiscal year,¹⁵⁸ it would have been extremely difficult for analysts to have made useful peer-to-peer option pay comparisons without knowledge of grant dates or grant date stock prices.¹⁵⁹

¹⁵⁶ See, e.g., Holman W. Jenkins Jr., *The Backdating Molehill*, WALL ST. J., Mar. 7, 2007, at A16; Posting of Geoffrey Manne to Truth on the Market, <http://www.truthonthemarket.com/2006/03/19/i-look-pretty-young-but-im-just-backdated-yeah> (Mar. 19, 2006, 10:45 EST); Manne & Wright, *supra* note 128.

¹⁵⁷ This calculation is based on a minimum closing price of \$12.90/share, a maximum closing price of \$26.38/share, and ExecuComp methodology.

¹⁵⁸ Prior to Sarbanes-Oxley, compensatory option grants were disclosed on SEC Form 5, which had to be filed on or before the forty-fifth day after the end of the issuer's fiscal year. Today, option grants must be reported on Form 4 within two business days of the grant. See *supra* notes 49-50 and accompanying text.

¹⁵⁹ This may be easiest to see by contrasting this situation with a "backdated" option on an imaginary zero volatility stock. Imagine that the stock of Low Tech always trades for \$25/share and that the CEO falsified paperwork to grant herself an option with a \$20/share strike price. (Obviously this could not be accomplished by backdating, since the stock is assumed to always trade for \$25/share.) One would not have to know the grant date to know that the CEO had procured an option that was \$5/share in the money. Once the market learns the strike price of this option, the fraud is obvious, and it continues to be obvious through the date of exercise, since by definition this option remains \$5/share in the money.

As a result, it is unlikely that the market would have penalized executives for the additional value transferred through backdating. As we have seen, the grant date value of backdated options reported to investors and calculated by analysts would have understated the compensation conferred, often substantially. Widely publicized reports, such as the annual CEO compensation surveys produced by *The New York Times* and *The Wall Street Journal*, report the grant date value of options and include this figure in calculating total current CEO compensation.¹⁶⁰ To be sure, each publication also reports option profits, but given the noisiness of stock price movements, the difficulty of distinguishing between gains arising from performance, luck, and overcompensation, and the fact that CEOs exercise options on an irregular basis, this data is relatively uninformative. In short, there is little reason to think that analysts or other market participants who were unaware of backdating would have adjusted any better than uninformed directors of individual firms.¹⁶¹

Firms complying with Sarbanes-Oxley must now report options within two days of grant, which reduces the noise problem and the potential for creating stealth compensation through backdating. *See supra* note 50 and accompanying text.

¹⁶⁰ *See, e.g., CEO Compensation Survey/2005, supra* note 5; *Executive Pay: A Special Report, supra* note 5.

¹⁶¹ Much has been blogged about market efficiency and backdating. *See, e.g.,* Manne, *supra* note 156 (arguing that backdating was not stealing because option parameters were fully disclosed); Manne & Wright, *supra* note 128 (arguing that the actual value/cost of backdated options was incorporated into share prices on disclosure or before and that investors could track the value of individual grants); Larry E. Ribstein, *Bodie on Backdating*, IDEOBLOG, http://busmovie.typepad.com/ideoblog/2006/09/bodie_on_backda.html (Sept. 2, 2006, 21:23 CST) (arguing that backdating did not hinder pay comparisons because parameters ultimately were disclosed); Larry E. Ribstein, *More on the First Backdating Article*, IDEOBLOG, http://busmovie.typepad.com/ideoblog/2006/09/more_on_the_fir.html (Sept. 22, 2006, 09:53 CST) (stating that the key question in determining whether backdating produced stealth compensation is “what happened to the affected firms’ shares when the backdating was disclosed”).

It appears to me that two distinct issues are being conflated in these discussions: first, whether stock prices accurately reflected the cost of backdated options despite the fraud, and second, whether the size of option grants or other elements of executive pay would have been adjusted to reflect the increased value associated with backdating. As for the first, I think it unlikely that stock prices were affected by the fraud. Market makers would only be concerned about the current aggregate expected cost/dilution resulting from outstanding options. Disclosure of accurate information regarding strike prices, shares covered, vesting, and expiration would allow the market to constantly update and incorporate the cost of options into share prices. Moreover, arbitrage opportunities provide a strong driving force for market participants to undertake the effort.

However, assessing the aggregate cost and value of options is a far different matter from assessing the level of executive pay and generating useful peer-to-peer comparisons. In adjusting a company’s stock price for option compensation, the market participants need not concern themselves with individual employee option value or with distinguishing between

One need not adhere to the managerial power view of executive compensation in order to doubt that the market penalized executives for added value achieved through backdating. For an adherent, however, doubts would rise to near certainty. The managerial power view of executive compensation reflects skepticism that executive pay arrangements arise solely from arm's length bargaining between directors and executives, and posits that to some extent executive pay ultimately is capped by investor outrage.¹⁶² Given this "outrage constraint," the managerial power view posits that executives can boost their compensation through camouflage.¹⁶³ Simply put, investors don't complain about compensation they don't see. It is hard to imagine more thoroughly camouflaged compensation than secretly backdated options whose value far exceeds that reported to shareholders.

G. *Other Potential Motivations or Explanations for Backdating Executive Stock Options*

Although I have been careful to frame the foregoing phenomena as "effects" of backdating and not "causes," one could easily conclude that "A" led to "B." Because surreptitious backdating increased the value of option grants (to a greater or lesser extent depending on whether backdated strike prices factored into share calculations) while reducing the reported value of options, and because both effects are beneficial for executives, one could conclude that these effects explain the backdating of executive stock options. This is possibly correct, but it would have taken a fair degree of economic sophistication to have figured all this out, and while I do not underestimate the amount of time and effort that some executives put into augmenting and camouflaging their own compensation, in many cases a simpler story may be more plausible. This section will simply flag some possible alternative explanations without purporting to fully develop them.

For example, although I have argued that backdating fixed-share option grants on highly volatile stocks is much less valuable than the strike price discounts would suggest, some 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. A bullish executive lacking

luck, success, and other factors contributing to current option value. Moreover, there is much less reason for the market participants to care. There is no arbitrage opportunity in accurately assessing CEO pay. Thus, I can easily imagine that stock prices were unaffected by backdating, but that recipients captured most or all of the value boost from surreptitious backdating, at least until the fraud was discovered.

¹⁶² See BEBCHUK & FRIED, *supra* note 17, at 64-66; Bebchuk et al., *supra* note 17, at 784-89. The arm's length bargaining view is generally referred to as the optimal contracting view and has a much longer pedigree than the managerial power view. See *id.* at 753 n.4, 762 n.8 (sampling optimal contracting thinking in legal scholarship and listing a few important works by economists working in the optimal contracting framework).

¹⁶³ See Bebchuk et al., *supra* note 17, at 789.

a high degree of economic sophistication might have viewed a \$1/share strike price reduction as approaching \$1/share in her pocket. If so, we do not need a complicated story about engineering enlarged fixed-value option grants to understand backdating.

More generously, even an economically sophisticated CEO could be the victim of a cognitive bias. For example, 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.¹⁶⁴ According to this theory and experimental evidence, individuals deviate from expected utility maximization in excessively preferring certain gains to risky ones.¹⁶⁵ 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.¹⁶⁶ 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.

One might also imagine that overconfidence, excessive optimism, or simply self selection could have contributed to backdating, but while bullishness alone would lead an executive to place an above-market value on options generally, it would not cause an economically sophisticated executive to place a particularly high value on discounting option strike prices. An executive who self selected into the technology sector and into a particular company would be expected to have a more positive view of the prospects for that firm and/or sector than the market generally. As a result, the executive would place a greater probability on the backdated option paying off and capturing the strike price discount ex post. So, too, would a randomly placed executive whose high degree of confidence and optimism contributed to her success in the executive tournament and was fostered by that success.¹⁶⁷ However, an

¹⁶⁴ See Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 263, 274-77 (1979).

¹⁶⁵ See *id.* at 265-67.

¹⁶⁶ See *id.* at 271-72.

¹⁶⁷ There is an extensive literature on overconfidence and optimism biases and their applicability to managers. See Simon Gervais et al., *Overconfidence, Investment Policy, and Executive Stock Options* 3-5 (July 24, 2003) (unpublished manuscript), available at <http://faculty.haas.berkeley.edu/odean/papers/Managers/GervaisHeatonOdean0703.pdf> (citing several studies). There are several reasons that CEOs, and tech firm CEOs in particular, might be susceptible to such biases. First, individuals have been shown to take too much personal credit for successful outcomes. Thus, overconfidence rises from past success. See Dale T. Miller & Michael Ross, *Self-Serving Biases in the Attribution of Causality: Fact or Fiction?*, 82 *PSYCHOL. BULL.* 213, 223 (1975). CEOs typically have been successful and tend to be overconfident. Second, overconfident managers are more likely to take risks and either win (or badly lose) the tournament to become CEOs. See Anand Mohan Goel & Anjan V. Thakor, *Rationality, Overconfidence and Leadership* 3-4

executive's strongly positive outlook (whatever the source) would also lead her to place a greater value on at-the-money options than would the market. As a result, it is not clear that a positive outlook alone would affect an executive's view of the *value boost* from discounting an option's strike price.¹⁶⁸

Less generously, there is the possibility that executive greed may at times be irrational. For example, executives often appear to fight for small payments or reimbursements despite their apparent economic insignificance.¹⁶⁹ 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 option 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.

Note, however, that the explanations considered in this section are consistent with the idea that backdating increased compensation efficiency. If executives placed greater value on strike price discounts than firms, backdating would have resulted in more efficient compensation. Moreover, it is not necessary to posit cognitive biases to find an efficiency explanation. Depending on risk aversion and other factors, it could have been more efficient for a company to compensate an executive with fewer option shares granted in

(Univ. of Mich. Ross Sch. of Bus. Working Paper Series, Working Paper No. 00-022, 2000), available at <http://hdl.handle.net/2027.42/35648> (developing a theoretical model that suggests that overconfident managers are more likely to be selected as leaders than otherwise identical managers who are not overconfident). Third, selection bias leads optimistic or overconfident managers to seek risky managerial jobs. See Gervais et al., *supra*, at 5. Being a CEO of a young technology firm is obviously highly risky.

¹⁶⁸ To see this more concretely, suppose the Tech Inc. executive referred to in Part II.A views her company as being 50% undervalued at \$50/share. If the executive assumes that the true value of the stock is \$75/share, and given the other assumptions made in that Part, the executive would value a \$50 strike option at \$54.41/share. Reducing the strike price on this option to \$40/share would increase the value to \$56.99, about a \$2.50 increase for a \$10 strike price reduction. On a percentage basis, the effect of backdating for this executive is even less than it would be for an executive whose price outlook matched the market.

Of course, if an executive were certain that an option would wind up being in the money, a \$1/share strike price discount would translate into a \$1/share increase in value. But an economically sophisticated executive would not be certain of a positive payoff, no matter how bullish she might be.

¹⁶⁹ 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.

the money than a greater number of option shares granted at the money.¹⁷⁰ In other words, backdating possibly could have been a win/win situation even if both parties were rational economic actors.

However, I am skeptical of this efficiency explanation for backdating. No evidence has been produced supporting the idea that firms and employees traded off reduced option shares in exchange for strike price reductions in order to improve the efficiency of their compensation arrangements. In fact, Bebchuk, Grinstein, and Peyer find just the opposite.¹⁷¹ Moreover, to my knowledge, none of the accused firms have made this argument in their defense, although it surely would be helpful to their cause.

One might go further and argue that the absence of openly granted in-the-money options following accounting reforms that eliminated the penalty for such grants (at least in the case of options issued to junior executives or rank and file employees that are not intended to qualify as ISOs) rebuts the efficiency argument. However, it is likely that the issuance of in-the-money options would be met by such outrage as would overwhelm any efficiency benefits, at least in the current environment.

* * * * *

To be clear, my primary aim in this Part has not been to explain the backdating of executive options, but to unpack the economics. In many cases, the best *explanation* for backdating may have been some combination of accounting aggressiveness, sloppiness, and weak oversight.¹⁷² However, by

¹⁷⁰ See Brian J. Hall & Kevin J. Murphy, *Optimal Exercise Prices for Executive Stock Options*, 90 AM. ECON. REV. (PAPERS & PROC.) 209, 213 (2000) (indicating that although the optimal range of option exercise prices generally includes the grant date market price, in-the-money options would be more efficient in some circumstances).

More direct efficiency explanations for backdating also have been offered. For example, Dierker and Hemmer have argued that backdating may have mitigated agency problems and led to improved timing of operational decisions. See generally Dierker & Hemmer, *supra* note 102. However, this benefit could be achieved only by informed directors negotiating with option recipients at arm's length. This assumption seems questionable, at least with respect to the majority of cases under SEC investigation for backdating.

¹⁷¹ See Bebchuk et al., *supra* note 2, at 37 (finding a positive correlation between CEO pay and receipt of manipulated stock options).

¹⁷² See Victor Fleischer, *Options Backdating, Tax Shelters, and Corporate Culture 2* (Univ. of Colo. Law Sch. Legal Studies Research Paper Series, Working Paper No. 06-38, 2006), available at <http://ssrn.com/abstract=939914> (suggesting a link between backdating and a loose, creative corporate culture focused on innovation). Surely not all instances of backdating constitute fraud. Attempts at companies such as Microsoft and Micrel to level the playing field between option grants to new employees would not be considered fraud, and violation of accounting rules in these cases may have been inadvertent. Even Bebchuk, Grinstein, and Peyer's evidence that CEO option strike prices correspond much more frequently to monthly low stock prices and much less frequently to monthly highs, see *supra* note 54 and accompanying text, does not demonstrate fraud. Although executives clearly did defraud their own boards in several of the high profile backdating cases that have

highlighting the relatively modest impact of backdating on the actual value of executive options, the significant impact on the reported value of those options, and the likelihood that this stealth compensation would have been retained by the recipients but for the revelation of the scandal, this Part has aimed to contribute to a fuller understanding of the backdating phenomena.

III. BACKDATING AND THE NON-EXECUTIVE EMPLOYEE

Although executive stock option backdating has received the greatest attention in the media, anecdotal and empirical evidence suggests 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, this Part examines the effects of backdating options granted to rank and file employees and the factors that may have motivated executives to discount options granted to these employees.

A. *The Role of Options Issued to Non-Executive Employees in the Backdating Scandal*

In some cases backdating probably was driven by simple executive greed, but the empirical evidence supporting this story is not overwhelming. Backdating executives did receive substantially more option value each year on average than their non-backdating peers, and thus had more at stake when backdating.¹⁷³ On the other hand, one would expect such greed to appear elsewhere, and thus it is notable that 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.

Moreover, 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.¹⁷⁴ It may turn out that the scandal is more widespread and tech firms have simply been the first firms identified, but assuming for the moment that the backdating was more prevalent 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

received the SEC's most urgent attention, we may find that some cases are explained by weak controls or by unfamiliarity with accounting and tax rules.

¹⁷³ See *supra* Part I.C.2.

¹⁷⁴ See *supra* Part I.C.1.

firms.¹⁷⁵ Thus, the preponderance of tech firms among companies under investigation suggests the possibility of a link between overall reliance on option compensation and backdating.

Comparing identified backdaters in the semiconductor industry with their peers provides further support for this idea. 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.¹⁷⁶ Apparently, option compensation ran more broadly or deeply at backdating firms.

In addition, anecdotal evidence suggests 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 for employees hired in rapid succession.¹⁷⁷ Moreover, the first complaint filed by 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 relatively few instances of the CEO achieving direct personal gain through backdating.¹⁷⁸

B. *Effects (and Causes) of Backdating Non-Executive Options*

Why would a CEO backdate an option granted to a potential hire? The Brocade complaint focuses on accounting consequences: if firms had openly discounted strike prices, there would have been expense recognition which backdating avoided.¹⁷⁹ But that is far from a complete answer. If the aim is to give a key employee an option worth \$1 million without recognizing compensation expense, 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? Consistent with the approach of the previous Part, we will begin by examining the effects of backdating options issued to rank and file employees on reported compensation, the size of

¹⁷⁵ During the late 1990s and early 2000s, technology companies generally utilized broad-based option plans that covered most or all employees. See NAT'L CTR. FOR EMPLOYEE OWNERSHIP, EMPLOYEE STOCK OPTIONS FACT SHEET (2005), <http://www.nceo.org/library/optionfact.html> ("Broad-based stock options are now the norm in high-technology companies . . . Research by Joseph Blasi at Rutgers University found that 97 of the top 100 e-commerce companies offer 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.* ("A 2003 WorldatWork study showed that options are popular in all kinds of public companies, with 15% of public companies offering options to most or all employees.").

¹⁷⁶ See *supra* note 80 and accompanying text.

¹⁷⁷ See *supra* notes 39-41 and accompanying text.

¹⁷⁸ Brocade Complaint, *supra* note 11, at 6-8, 11-13.

¹⁷⁹ *Id.* at 8-13.

incentive stock option grants, and limitations on share issuance, and conclude by briefly considering other possible explanatory factors, such as cover provided for executive option grants.

1. Effect of Backdating on Reported Compensation of Rank and File Employees

Backdating options granted to rank and file employees reduced reported compensation expense for these employees just as it reduced reported executive option expense. The only difference is the location of the disclosures. The extremely detailed disclosure of stock options discussed in Part II.C is required only for grants received by a company's most senior executives. Investors have to look elsewhere to determine firm-wide compensation via options.

Of course, it would have been futile for investors to look for option compensation reflected in the body of the company's earnings statement. As noted above, prior to 2006, firms were not required to record any expense for standard at-the-money options when calculating earnings per share.¹⁸⁰ However, this does not mean that backdating option grants to the rank and file had no impact on reported compensation.

First, although the total value of options granted to the entire workforce is not disclosed in the body of the earnings statement, the total number of shares subject to options granted is disclosed in the footnotes to annually filed financial statements.¹⁸¹ Backdating rank and file options would have allowed firms to maintain value delivered via options while marginally reducing the number of shares subject to these options. I have argued that options granted to a CEO who tricked his board into backdating would not have been reduced in size to reflect the value boost, but it is completely plausible that a CEO who backdated options used to recruit an underling would have offered a smaller grant.

Second, sufficient information is provided in proxy statements to allow analysts to estimate the average Black-Scholes value of options granted each year. In addition to providing the number of shares covered by option grants, companies disclose the weighted average strike price of options issued during the year, expected volatility, expected life, and the risk-free interest rate.¹⁸²

¹⁸⁰ See *supra* note 12 and accompanying text.

¹⁸¹ See, e.g., Comverse Tech., Inc., Annual Report (Form 10-K), at F-16 to -17 (Apr. 30, 2002) [hereinafter Comverse 2001 Annual Report] (disclosing option grants to employees covering 8.6 million, 9.3 million, and 9.9 million shares for fiscal years 1999, 2000, and 2001).

¹⁸² See, e.g., *id.* at F-16 to -18 (reporting a weighted average exercise price of \$18.03/share, volatility of 76%, risk-free interest rate of 4%, and average expected life of 4.3 years for options granted in fiscal year 2001). Because these options were purportedly granted at the money, analysts would have used the reported strike price as the market price

Reducing the average strike price through backdating would have resulted in lower estimated Black-Scholes values for a company's entire workforce.

However, the need for analysts to estimate Black-Scholes values from proxy statement data was largely eliminated in 1995 when the FASB began requiring companies to include a pro forma earnings calculation in the footnotes to their financial statements, disclosing the impact of stock options "as if" they had been expensed utilizing Black-Scholes methodology.¹⁸³ Reducing strike prices through backdating would have reduced pro forma compensation expense substantially, just as it reduced 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.

2. Effect of Backdating on Incentive Stock Option Grants

Backdating increased the effective size of ISO grants, which would have provided a benefit to employees at the expense of taxpayers rather than shareholders. As noted above, recipients of ISOs who meet the tax code's holding requirements pay tax on their gains at the lower rate applicable to long-term capital gains.¹⁸⁴ This is obviously attractive for the employees. The downside is that companies granting options that qualify as ISOs are not permitted a compensation deduction for tax purposes.¹⁸⁵ 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. Start-up companies often are in a zero or very low effective tax bracket because their deductible expenses outweigh their income for several years.¹⁸⁶

However, 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.¹⁸⁷ The \$100,000 annual limit renders ISOs almost insignificant for senior executives who often 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 would have boosted the size of ISO grants, consider the purported October 31, 2001, Brocade grant. In January of 2002, Brocade's

of the stock on the dates of the grants. Under these assumptions, the average Black-Scholes value for options issued by Comverse for fiscal year 2001 would have been \$10.92/share.

¹⁸³ SFAS 123 (1995), *supra* note 12, ¶ 69; *see also* Comverse 2001 Annual Report, *supra* note 181, at F-17 (disclosing that the company's net income for fiscal year 2001 would have been reduced by \$181,837,000 if option compensation had been expensed).

¹⁸⁴ *See supra* note 24 and accompanying text.

¹⁸⁵ *See* I.R.C. § 421(a)(2) (2000).

¹⁸⁶ *See* MYRON S. SCHOLLES ET AL., TAXES AND BUSINESS STRATEGY 76 (2d ed. 2002).

¹⁸⁷ *See* I.R.C. § 422(d).

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.¹⁸⁸ The Black-Scholes value of that option (pre-tax) would have been \$24.96/share, or approximately \$68,266.¹⁸⁹ 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.

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.¹⁹⁰ There is no direct evidence that boosting the size of ISO grants was a motive for backdating, but it surely was a consequence.

3. Effect of Backdating on Share Limitations and Dilution

Backdated rank and file options, if reduced in size to reflect part or all of the value boost, would have allowed executives to stretch their option-granting authority and mitigated shareholder concerns about dilution. To be sure, this is a contingent effect of backdating. If firms and employees traded option shares for strike price discounts as some commentators have suggested, and as seems plausible to me with respect to rank and file options, this effect follows.

As in the case of stock sold to the public, shares underlying stock option grants are limited by the number of authorized shares specified in company charters. Shareholder approval is generally required to amend the charter to increase the number of authorized shares.¹⁹¹ 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.¹⁹² 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.¹⁹³ Prior to 2003, shareholder approval was not

¹⁸⁸ $\$100,000 / \$36.56 = 2735.23$ shares.

¹⁸⁹ $2735 \text{ shares} \times \$24.96/\text{share} = \$68,265.60$.

¹⁹⁰ See I.R.C. § 422(b)(4).

¹⁹¹ See, e.g., DEL. CODE ANN. tit. 8, § 242(a)(3) (2007).

¹⁹² See, e.g., Brocade Form S-8, *supra* note 33, exhibit 4.4, at 3 (“[T]he maximum aggregate number of Shares which may be optioned and sold under the Plan is one million (1,000,000) Shares.”).

¹⁹³ Shareholder authorization is required for all equity compensation plans adopted by companies listed on the New York Stock Exchange and NASDAQ. See N.Y. STOCK EXCH., LISTED COMPANY MANUAL § 303A.08 (2006), available at http://www.nyse.com/lcm/lcm_

required in all cases, but it was required with respect to plans that were used to grant ISOs,¹⁹⁴ plans designed to deliver performance-based pay per I.R.C. § 162(m),¹⁹⁵ and plans including company officers and directors if not broad-based.¹⁹⁶ Shareholder approval of option plans limited to rank and file employees could be avoided, but with some difficulty.

In addition, during the late 1990s and early 2000s, there was a great deal of investor angst related to the potentially dilutive effects of what were viewed as runaway option programs.¹⁹⁷ By increasing the value of each option share, backdating may have mitigated dilution concerns and allowed executives to avoid or postpone the bite of share issuance limitations.

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 even less for options on highly volatile stocks.

4. Other Potential Causes of Backdating Rank and File Options

The foregoing effects may help explain why executives backdated options issued to non-executive employees, but of course there are many other potential explanations. The previous Part concluded with the suggestion that poor oversight combined with a culture of accounting aggressiveness may have contributed to the backdating of executive option grants, and those factors likely played a role in backdating rank and file options as well. This section will very briefly consider other possibilities.

a. *Cognitive Biases*

The share limitation explanation for backdating non-executive options discussed above seems more plausible if we add the possibility of employee

section.html; NASDAQ, NASDAQ MANUAL § 4350(i) (2006), available at <http://nasdaq.complinet.com>.

¹⁹⁴ See I.R.C. § 422(b)(1).

¹⁹⁵ See Treas. Reg. § 1.162-27(e)(4)(i) (as amended in 1996) (requiring shareholder approval of material terms of performance goals and hence option plans intended to satisfy I.R.C. § 162(m)).

¹⁹⁶ 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).

¹⁹⁷ See Joann S. Lublin & Leslie Scism, *Stock Options at Firms Irk Some Investors*, WALL ST. J., Jan. 12, 1999, at C1; Robert McGough, *Tech Companies' Liberal Use of Stock Options Could Swamp Investors, Drain Firms' Resources*, WALL ST. J., July 28, 2000, at C1; Phyllis Plitch, *Fight Erupts Over Stock-Option Plans*, WALL ST. J. ONLINE, Oct. 2, 2000, available at <http://proquest.umi.com/pqdweb?did=61667963&sid=2&Fmt=3&clientId=3740&RQT=309&VName=PQD>.

naiveté or cognitive biases.¹⁹⁸ 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 or an individual acting in accordance with prospect theory 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 \$232,000.¹⁹⁹ Perhaps Brocade's defense to shareholder suits should be that the company took advantage of cognitive biases and backdated options to recruit and retain talent cheaply.

b. *Cover for Executive Option Backdating*

Another motivation for backdating options issued under broad-based plans might have been the cover it provided 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 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.²⁰⁰

c. *Common Advisors*

The previous factors may help explain why executives would wish to backdate options granted to their underlings. None is inconsistent with the high concentration of technology companies among firms under investigation and the apparent relationship between backdating and heavy company-wide

¹⁹⁸ See *supra* Part II.G for a fuller discussion of cognitive biases in the context of executive option grants.

¹⁹⁹ Based on self-reported volatility of 112% (2001 and 2002 average), see Brocade Commc'ns Sys., Inc., Annual Report (Form 10-K), at 56 (Jan. 22, 2003), and an anticipated three year life, the Black-Scholes value of a Brocade option issued at the money at \$36/share is \$24.96/share; the value of a \$24/share strike option when the stock price is \$36/share is \$27.28/share. $100,000 \times (\$27.28 - \$24.96) = \$232,000$.

²⁰⁰ See Comverse Affidavit, *supra* note 138, at 19-20. 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 4 was its lowest of the first half of the year. See Charles Forelle & Mark Maremont, *Monster Worldwide Gave Officials Options Ahead of Share Run-Ups*, WALL ST. J., June 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.

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. It has been suggested that backdating was particularly pervasive in Silicon Valley.²⁰¹ It is unlikely that each of the semiconductor and software companies currently under investigation for 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.²⁰² 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. And, in fact, as the list of firms under investigation has grown, it appears that the proportion of Sonsini-advised companies in the fray is roughly consistent with Sonsini's market share.²⁰³ Nonetheless, it may be that the concentration of tech firms in the pool of companies under investigation is partially explained by common advisors who either suggested or condoned the practice.²⁰⁴

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 Article. I will, however, 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 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

²⁰¹ See Heron & Lie, *supra* note 48, at 276.

²⁰² See Gary Rivlin, *A Counselor Pulled from the Shadows*, N.Y. TIMES, July 30, 2006, § 3, at 1 (reporting that the Wilson Sonsini law firm had represented just under 50% of the Silicon Valley companies implicated in the scandal).

²⁰³ Roger Parloff, *Larry Sonsini: The Man to See in Silicon Valley*, FORTUNE, Nov. 17, 2006, at 150, 166. Parloff also notes that the Boston-based law firm Hale & Dorr (now WilmerHale) represented five of the thirteen Massachusetts-based companies under investigation for backdating. *Id.*

²⁰⁴ Cf. John C. Coates IV, *Explaining Variation in Takeover Defenses: Blame the Lawyers*, 89 CAL. L. REV. 1301, 1304 (2001) (providing evidence that lawyers determine key terms in the "corporate contract").

investigation to result in suit, and shareholder litigation undoubtedly is already underway with respect to most of the identified backdaters. It is important that prosecutors, shareholders, and 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 may be 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 "preliminary analysis shows that almost \$6.4 million of that profit was due to backdating."²⁰⁵ \$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 sizes of the option grants were based on value instead, a point that should be resolvable through discovery, backdating may 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.²⁰⁶ Retroactive cancellation and disgorgement of all profits derived from fraudulently procured options may be the appropriate remedy in many of these cases.²⁰⁷ In some cases, however, options represented over 95% of senior executive compensation.²⁰⁸ Because complete disgorgement would leave these executives with virtually no compensation for their work, courts may lean

²⁰⁵ Comverse Affidavit, *supra* note 138, at 14.

²⁰⁶ See ROBERT CHARLES CLARK, CORPORATE LAW § 5.2.2, at 171 (1986).

²⁰⁷ See, e.g., *State ex rel. Hayes Oyster Co. v. Keypoint Oyster Co.*, 391 P.2d 979, 986 (Wash. 1964) ("[W]hatever 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.").

²⁰⁸ 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. See source cited *supra* note 122.

toward disgorgement of the additional profits achieved as a result of backdating, in which case accurate determination of gains will be critical.²⁰⁹

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.²¹⁰ This is a very positive accounting development, but I would expect it to have zero effect on backdating or other option pricing manipulation. Backdating 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."²¹¹ 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 FASB allowed companies unlimited freedom to understate their expenses and overstate their reported income through liberal use of at-the-money options.

Moreover, it seems extremely unlikely that the firms under SEC investigation for backdating would have openly granted in-the-money options instead, even had there been no accounting or tax penalties associated with granting such options. Although some commentators have suggested that in-the-money options may have had better incentive properties than at-the-money options of equivalent Black-Scholes value,²¹² none of these companies have made this claim.²¹³ Reviewing the rationales discussed in Parts II and III, the

²⁰⁹ See *Int'l Telecharge, Inc. v. Bomarko, Inc.*, 766 A.2d 437, 441 (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).

²¹⁰ See SFAS 123R (2004), *supra* note 12, ¶ 1.

²¹¹ Brocade Complaint, *supra* note 11, at 2.

²¹² See, e.g., Manne, *supra* note 156.

²¹³ As discussed in Part I.A, the optimum relationship between option strike price and the market price of the underlying stock depends on the desired level of pay for performance sensitivity and the risk preferences of the optionees. Backdating aside, however, equity compensation almost always takes one of two discrete forms: options granted at the money or "options" granted with zero strike price, i.e., restricted stock. It is conceivable that some firms would find in-the-money options to be more efficient and would grant them but for the adverse accounting consequences, but I am skeptical of this explanation for backdating. Certainly, I have seen no one purport to show that backdating firms differed from their peers with respect to firm risk or other factors relevant to optimal option design. More

only benefit of backdating that carries over to openly granting in-the-money options is avoidance of share limitations and mitigation of dilution concerns. To the extent that backdating was intended to hide compensation from investors or regulators, openly granting in-the-money options would have been a completely ineffective substitute. 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, and the value reported to investors in each case would be \$1 million.

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.²¹⁴

C. Disclosure Changes

On the other hand, as Heron and Lie have shown, changes in option grant reporting requirements mandated by Sarbanes-Oxley have substantially curtailed backdating of stock options granted to senior executives.²¹⁵ 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 that 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.²¹⁶ 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 spring-loading, 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.²¹⁷ 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

importantly, firms that believed that in-the-money options would be efficient compensation tools could closely replicate them through a combination of at-the-money options and restricted stock.

²¹⁴ In addition, tax rules continue to preclude ISOs and non-qualified option grants to top executives from being granted in the money. See I.R.C. § 422(b)(4) (2000).

²¹⁵ See Heron & Lie, *supra* note 48, at 273.

²¹⁶ See *id.* at 280.

²¹⁷ See Securities Exchange Act of 1934 § 16(a)(1), 15 U.S.C. § 78p(a)(1) (Supp. IV 2004) (defining the class of persons required to file reports with the SEC disclosing changes in beneficial ownership of securities).

requirements to include all recipients would eliminate this gap, the reporting burden would be extreme.

D. *Reducing Compensation Complexity*

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.²¹⁸

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 opportunistically selected by the executive.²¹⁹

²¹⁸ See generally David I. Walker, *The Manager's Share*, 47 WM. & MARY L. REV. 587 (2005).

²¹⁹ In addition to cherry picking option grant dates, there is evidence that some executives have backdated option exercise dates in order to reduce their tax bills. See Eric Dash, *Dodging Taxes Is a New Wrinkle in the Stock Options Game*, N.Y. TIMES, Oct. 30, 2006, at C1 (reporting allegations of exercise backdating at Symbol Technologies and Mercury Interactive); Jennifer Levitz, *Comverse Ex-CEO May Have Fudged Option Exercise Dates, Not Just Grants*, WALL ST. J., Dec. 6, 2006, at C1 (reporting suspicious exercise timing at Comverse). The exercise of an ordinary compensatory option (not an ISO) results in ordinary income for the owner equal to the difference between the aggregate exercise price and the market value of the shares received. This tax arises whether the optionee retains the shares or disposes of them. If the shares are retained, the market value at the time of exercise becomes the shareholder's basis. By backdating and purporting to have exercised options on a date when the market price was lower than that on the actual date of exercise, an executive would reduce the amount of ordinary income reportable and

CONCLUSION

Clearly, much more could be said about the causes and consequences of backdating. However, in an attempt to keep this Article relatively brief, I have chosen to focus my analysis on the economics of backdating, and, to a lesser extent, on the characteristics of companies under investigation. Even so, drawing firm conclusions is often difficult. For example, the economic analysis highlights the critical importance of ascertaining exactly how the sizes of grants were determined in assessing the value of backdating to option recipients. Strike price discounts in isolation, although loudly trumpeted in the press, tell us little. But this much is clear: Whether or not the sizes of option grants were affected by backdating, proxy filings significantly understate the grant date value of backdated options issued to senior executives, effectively camouflaging a sizeable portion of executive equity compensation.

However, both empirical and anecdotal evidence suggest that it would be a mistake to focus solely on the executive suite in attempting to understand backdating. Rank and file employees were the apparent beneficiaries of numerous backdated option grants, and at least within the semiconductor industry the frequency of backdating appears to correspond with the degree of firm reliance on option compensation. This Article has outlined several potential motivations for backdating rank and file option grants, but the 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.

tax due at the time of exercise. Of course, this also means that the executive would have a lower basis in the shares going forward and would face a larger capital gains tax on the ultimate disposition of the shares, but at the top end of the income scale capital gains are taxed at less than half the rate applied to ordinary income, and the tax bill could be postponed indefinitely.

Note, however, that the backdating executive and the IRS are not the only interested parties here. An employer's tax deduction for option compensation is equal to the amount of ordinary income included by the optionee as a result of exercise. *See* I.R.C. § 83(h). Thus, an executive who reduces her taxable income by backdating option exercise dates increases the taxable income and taxes of her employer.

Note also that the simplified compensation plans suggested herein would not have to be limited to cash payouts. Shares could still be the medium for payment by cash-strapped start-ups.

APPENDIX A. COMPANIES SUBJECTED TO SEC INVESTIGATION WITH RESPECT
TO STOCK OPTION GRANTS THROUGH JUNE 12, 2007.²²⁰

Company	SIC	Company	SIC
Delta Petroleum	1311	PMC-Sierra	3674
Nabors Industries	1381	Power Integrations	3674
KB Home	1531	QuickLogic	3674
Dean Foods	2020	Semtech	3674
Hansen Natural	2086	Sigma Designs	3674
Alkermes	2834	Silicon Image	3674
KOS Pharmaceuticals	2834	Trident Microsystems	3674
Sepracor	2834	Vitesse Semiconductor	3674
Valeant Pharmaceuticals	2834	Xilinx	3674
Medarex	2836	Zoran	3674
Ceradyne	3290	Molex	3678
Asyst Technologies	3559	Keithley	3825
Brooks Automation	3559	Sunrise Telecom	3825
Apple	3571	KLA-Tencor Group	3827
Blue Coat Systems	3572	Meade Instruments	3827
M-Systems	3572	Endocare	3841
Brocade	3576	Arthrocare	3845
Cirrus Logic	3576	Cyberonics Inc.	3845
Extreme Networks	3576	Stolt-Nielson SA	4412
Foundry Networks	3576	Boston Comms.	4812
SafeNet	3577	Equinix	4813
Engineered Support Sys.	3585	Cablevision	4841
Comverse Technology	3661	American Tower	4899
Sycamore Networks	3661	Ibasis	4899
Research In Motion	3663	Home Depot	5211
Jabil Circuit	3672	Costco	5399
Sanmina-SCI	3672	Bed Bath and Beyond	5700
Altera	3674	CEC Entertainment	5812
Amkor Technology	3674	Cheesecake Factory	5812
Analog Devices	3674	Caremark Rx	5912
Applied Microcircuits	3674	Barnes and Noble	5940
Atmel	3674	Michael's Stores	5945
Broadcom	3674	Insight Enterprises	5961
Linear Technology	3674	United HealthCare	6324
Marvell Technology	3674	HCC Insurance	6331
Maxim Int. Products	3674	Macrovision	6794

²²⁰ See *Perfect Payday*, *supra* note 1. Bold font indicates that the SEC's investigation has been concluded without punitive action being taken.

Company	SIC	Company	SIC
Mips Technology	6794	Quest Software Inc.	7372
Monster Worldwide	7311	RSA Security	7372
Getty Images	7330	Take-2 Interactive	7372
Crown Castle	7359	THQ	7372
CNET Networks	7370	VeriSign	7372
Computer Sciences	7370	Witness Systems	7372
Black Box	7370	F5 Networks	7373
Activision	7372	Nyfix Inc.	7373
Autodesk	7372	Redback Networks	7373
Chordiant Software	7372	Verint	7373
Electronic Arts	7372	Affiliated Computer	7374
Intuit	7372	Pixar	7812
McAfee	7372	Pediatrix	8060
Mercury Interactive	7372	Apollo Group	8200
Openwave Systems	7372	Corinthian Colleges	8200
Progress Software	7372		

APPENDIX B. SIC CODE 3674: SEMICONDUCTORS AND RELATED DEVICES.
FIRMS UNDER INVESTIGATION FOR BACKDATING AND CONTROL COMPANIES.

Backdating Companies²²¹	Control Companies²²²
Altera	Actel
Analog Devices	Advances Micro Devices
Applied Microcircuits	Alliance Semiconductor
Atmel	AXT
Broadcom	Conexant Systems Inc.
Linear Technology	Cree
Maxim Int. Products	Cypress Semiconductor
Micrel	ESS Technology
Nvidia	Exar
PMC Sierra	Fairchild Semiconductor
Power Integrations	Innovex
QuickLogic	Integrated Device Technology
Semtech	International Rectifier
Trident Microsystems	Kopin
Vitesse Semiconductor	Lattice Semiconductor
Xilinx	LSI Logic
Zoran	Microchip Technology Inc.
	Micron Technology
	Microsemi
	National Semiconductor
	Neomagic
	Pericom Semiconductor
	Phototronics
	RF Micro Devices
	Skyworks Solutions
	Standard Microsystems
	Supertex
	Three-Five Systems
	Transwitch
	Triquint Semiconductor

²²¹ The compilation of the backdating group begins with the SIC 3674 companies listed in Appendix A. Amkor Technology, Marvell Technology, Sigma Designs, and Silicon Image were eliminated from the sample because sufficient data was not available in ExecuComp or Compustat. Nvidia and Micrel were included based on admissions or announced internal investigations.

²²² 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.

APPENDIX C: COMPARISONS OF THE SIC CODE 3674 BACKDATING AND CONTROL GROUPS.²²³

Variable	Backdating Group (N=17)			Control Group (N=30)		
	Mean	Median	S. Dev.	Mean	Median	S. 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 (\$)**	124,688	70,538	147,785	42,520	22,317	55,594

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

²²³ 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.