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Abstract: Stock options are a major component of executive pay in America today. With this popularity come opportunities for individuals to improperly enrich themselves through manipulation of key dates related to the stock options (backdating). At this date, over 150 publicly traded companies are under investigation for the improper backdating of stock options. The first section of this paper illustrates stock option mechanics and outlines the prior and current accounting treatment of stock options. It also summarizes recent related legal activity and recent academic research. The paper then analyzes the impact of backdating on financial reports, shareholder proxies, and income tax compliance. The second section of the paper identifies commonalities associated with companies under investigation for backdated stock options. This involves an analysis of external auditors, SIC codes, corporate headquarter location and company compliance with Section 404 of the Sarbanes Oxley Act. The final section of the paper analyzes capital market reaction to companies under investigation for backdating stock options. The analysis identifies a clear stock price underperformance of those investigating companies when compared to a peer group. It also identifies a drop in the observed price earnings ratio when compared to the same peer group as well as a decrease in the average beta coefficient for companies investigating the backdating of stock options.

Key Words:

Backdated Stock Options

Capital Market Reaction

JEL Classifications:

K22 - Corporation and Securities Law

M41 - Accounting



Introduction

For the year 2006, it was difficult to find a day when the financial press was not vilifying the board of directors or management of a publicly traded company for the practice of backdating of stock options. Although the stock option had long been a purported means of attracting the best and brightest individuals to join a company's management team and to reward managers for good performance, companies were suspected of using the stock option as a tool of executive deception and greed. In this paper, the authors clarify the proper accounting treatment of stock options, identify a common profile of companies whose stock option practices are under investigation, and summarize capital market reaction to companies who may have improperly backdated stock options.

The backdated stock option tempest became quietly enough. The media first reported an option backdating case in July, 2005 when Mercury Interactive Corporation announced that its board of directors had formed a special investigative committee in connection with an informal SEC probe of past stock option grants which were suspected of being "backdated." The special committee found 49 cases in which the reported date of a Mercury stock option grant differed from the date on which the option appears to have been actually granted by the company's board of directors. In November 2005, three top executives, including the company's CEO, resigned. During the period of encompassing the executive resignations and the disclosure of improper handling of stock option grant dates, the company's stock price declined 25%. Mercury Interactive Corporation's stock was also delisted from the NASDAQ, in part because of the company was unable to file a restatement of earnings with the SEC in a timely manner to account for this improper treatment of the stock options. (Kanigher, 2006)

More recently, in August 2006, three executives from Converse Technology were indicted in U.S. District Court and charged with conspiracy to commit securities fraud, mail fraud, and wire fraud in connection with the backdating of stock options. The executives were accused of reaping millions of dollars in profits from a scheme involving manipulation of stock option grant dates, and issuing false and misleading financial statements to the company's shareholders and the investing public regarding the true value of option grants they received. (Finfacts, 2006) Both Mercury and Converse have been required to restate their financial statements because of the improprieties in handling their stock option plans. (Sher, 2006)

The Stock Option

A stock option is not a new or exotic security. It is a commonplace equity security that provides the holder the opportunity, but not the obligation, to purchase a particular stock at a given price (called the exercise or strike price), over a fixed time period. Thus, a stock option allows the holder to profit from an increase in the market price of the underlying stock. If the market price of the stock does not increase in value over the exercise price during its term, the option becomes valueless and is discarded.

Stock options are commonly awarded through employee stock option plans (ESOPs). Some ESOPs grant options to a company's rank and file employees while some ESOPs grant options only to the company's executives. Since the company issues new shares or shares of treasury stock when options are exercised in an ESOP, exercise of the options increases the company's outstanding shares.

Stock options may also be created by institutions or individuals who sell an investor the right to purchase a company's stock that has previously been issued at a specified price. This type of option is described as a call option and is not addressed in this research. Call options have a relatively short exercise period ranging from 30 to 90 days. Their exercise does not increase the company's outstanding shares

Employee Stock Option Plans

Although the practice of backdating of stock options granted in ESOPs has only been identified in recent years, the concept of the ESOP was developed in the 1950s by investment banker and lawyer Louis Kelso. He argued that the capitalist system would be more effective if all workers, not just a few stockholders, could share in company ownership. However, because of the lack of a statutory framework for ESOPs at the time, very few companies sponsored such plans until the middle 1970s. In 1974 the U. S. Congress enacted the Employee Retirement Income Security Act of 1974 (ERISA). In addition to governing employee benefit plans, ERISA established a statutory framework for ESOPs. Subsequently, ESOPs flourished in both privately and publicly owned companies. (NCEO, 2007) Over 90% of the Fortune 1000 companies presently offer their employees stock options through ESOPs. (Kanigher, 2006)

As a matter of law, ESOPs must be in conformity with the stock option plan that is adopted by the company's board of directors. Some ESOPs also require approval of the company's shareholders. The board of directors, or a compensation committee appointed by the board of directors, decides who receives the stock option awards and the terms of the options.

The ESOPs adopted by Mercury Interactive Corporation and Converse Technology are described as performance based stock option plans. Performance based stock option plans are usually offered only to company executives and are often touted as a means to attract talented executives. They are also the most popular form of long-term compensation incentive offered to executives in major U.S. companies. Options granted in performance based stock option plans usually do not vest for a year or more, but the right of the executive to exercise the options continues for an extended period of several years. The exercise price is usually set at the underlying stock's closing market price on the date the company awards the options to the executives. The date that a company awards stock options to its executives is called the option plan's grant date. Clearly a stock option has the most value to an executive when the grant date is the date when the market price of the underlying stock is at its lowest value for the year.

Since stock options provide executives the opportunity to obtain larger ownership interests in the company, particularly if the company is successful and its share price increases, executives are expected to align their interests with the interests of stockholders. Accordingly, stock option grants are expected to motivate executives to manage more effectively in order to improve the company's performance which should increase the company's share price and hence, increase the return for all shareholders. (Ibid. 2006)

Although the ESOP has been a popular mechanism for companies to compensate executives since the middle 1970s, the use of executive stock options to provide significant amounts of executive compensation peaked during the Internet boom in the 1990s. Internet and technology based companies emerging at this time were generally cash poor and used stock options to compensate their executives while paying them relatively low cash salaries. This strategy worked very well for many executives in the mid to late 1990s because of a booming stock market which caused the options to become extremely valuable. (Sher, 2006)

However ESOPs have also caused serious issues for companies and their executives. ESOPs were designed with the expectation that executives receiving the options would act with honesty and integrity. Unfortunately this expectation has not always been met. Over the years, many executive stock options plans have created an obsessive focus on share price as the sole measure of corporate success. Some executives have been satisfied with a quick spike in their company's share price which allowed them to exercise their options and then leave the company. ESOP plans have also been compared to the previous generation's use of country club

memberships and private jets as a way of gouging out additional compensation for a job that is already being handsomely paid. (Broughton, 2007) Currently, the SEC is investigating numerous companies for changing the grant dates of their ESOPs in a practice called backdating. The practice of backdating is suspected of incorrectly valuing the options that have been granted to the companies' executives and possibly resulting in improper financial and income tax reporting.

Backdating of Stock Option Grant Dates

Stock options are backdated when the grant date for a stock option plan is set at a date prior to the time the board of directors effected the stock option plan by awarding options to its executives¹ Studies of companies that have backdated stock option grant dates show that the newly selected date is usually a day in which the market price of the stock is lower than the market price on the date the options were awarded by the board of directors. Often the backdated grant date is the day the market price of the stock was at its lowest value for that particular period. (Kanigher, 2006)

The exercise price of a stock option is usually set at the closing market price of the underlying stock on the option's grant date which is normally understood to be the date the option is awarded to an executive. Under these conditions, the option is said to be granted "at the money" since the option has no value at its grant date; i.e., the date the option was awarded. However, selecting a grant date in which the market price of the company's stock is lower than the market price on the date the board awarded the option results in the option being granted "in the money." The executive has a gain at the date the option is awarded equal to the excess of the current market price of underlying stock over the exercise price. (Ibid., 2006) Hence, backdating can increase the value of the options granted in an ESOP and potentially create higher gains for executives when they exercise their options.

Academic Research of Backdating Stock Options

Company practices of backdating stock option plan grant dates has been extensively studied as part of academic research. In 1997, Yermack's research on executive stock option plans found that market prices of many corporations' stock increased immediately after ESOP grant dates. The study speculated that this pattern was most likely due to "spring loading,"

¹Backdating can be accomplished at the time the board of directors makes an award of stock options by designating an earlier date as the grant date, or backdating may be made retroactively by changing the grant date on some date after the board has awarded the options

whereby the grant date was timed just prior to the announcement of favorable news for the company which would cause the price of the stock to increase. (Yermack, 1997)

In 2004 Lie found that in addition to stock prices increasing shortly after grant dates for many companies, the same companies' stock prices also tended to decrease just before grant dates. The study showed that the pre-and post-grant price patterns intensified over time and that the overall stock market performed worse than normal immediately before the grant dates and better than normal immediately after the grant dates. By the end of the 1990s, the aggregate price pattern was so pronounced that it appeared executives would have had to been able to predict short-term movements in stock prices in order to have selected a grant date that provided such an advantageous exercise price. The study concluded that the corporate executives most likely had changed the grant dates for the stock options to the day the market price of the company's stock had fallen to a particularly low price for the year. (Lie, 2005) In a later study, Heron and Lie found that the patterns of the 1990s practically stopped after August 2002 when the Sarbanes Oxley Act began requiring executives to report stock option grants to the SEC within two business days of the grant. (Heron, 2007)

Statistical Analysis by the Wall Street Journal

The possibility of companies backdating stock option grant dates gained wide spread public attention in March 2006 when the Wall Street Journal (WSJ) used a statistical analysis which identified six companies that had highly suspicious stock option grant practices. The WSJ study found that some companies' top executives consistently received stock option grants on unusually propitious dates. In some cases, the statistical analysis suggested that the odds of selecting grant dates by chance that would have such a favorable pattern as those selected were highly improbable. In one case the odds were suggested to be around one in 300 billion. (Forelle, 2006)

Investigations by the Securities and Exchange Commission

The SEC has identified more than 160 companies that may have backdated stock options. The list includes such household names as Apple Computer and Home Depot. (Reuters, 2006) In response, more than 20 companies have announced the formation of independent committees to investigate option granting practices (or have announced the existence of a government investigation into their option grants). (Kanigher, 2006)

The SEC's investigation on stock option backdating is focusing on companies in which the price of the underlying stock increased materially between the purported grant date and the day executives and directors filed Form 4 with the SEC. (Reuters, 2006) Executives and directors are required to disclose on Form 4 the issuances, exercises, cancellations, and regrants of stock options, including repricings. (Jacob, 2002) Most SEC investigations have centered on stock option grants made before August 29, 2002. After that date, the Sarbanes Oxley Act required executives of publicly owned companies to file Form 4 with the SEC within two business days of the date the board of directors effected a stock option grant. Prior to August 29, 2002 the SEC allowed executives to report information about stock option grants up to 45 days after the company's fiscal year-end. (Ibid., 2002)

Legality of Backdating Stock Option Grant Dates

A common public misconception is that the backdating of stock options is always illegal. A company's board of directors or compensation committee may select any strike price or grant date (even backdated) for the stock option plan. Hence, the strike price is not required to be set at the underlying stock's market price at the date the board of directors provides the grant. The impropriety of selecting a strike price equal to the stock's market price at an earlier date arises when the actions taken are not permitted by the company's stock option plan, and/or results in a company's financial statements, disclosures, and income tax returns being misstated. (Kirk, 2006)

Backdating is legal if the following conditions are met:

- The company granting the options has not forged any documents.
- The company's shareholders have been clearly informed about the backdating.
- The effect of backdating has been properly disclosed in the company's financial statements and proxy statements.
- The effect of backdating has been properly reflected in the company's reported net income.
- The effect of backdating is properly reflected in the company's income tax return.

However, the results of academic research on backdating practices have shown that in most of the cases identified, these conditions were not met. Hence, backdating was usually suspected to be illegal. (Lie, 2005)

Impact of Backdating on Financial Statements

Prior to 2006 most companies used the intrinsic method to account for executive stock option plans. (APB, 1972) Under the intrinsic method, the amount of compensation expense recognized from granting employee stock options was measured by calculating the difference between the market price of the stock at the grant date and the option's exercise price. Compensation expense was recognized only if the market price of the company's stock at the grant date was greater than the exercise price. Since the exercise price of most stock options is set equal to the market price of the stock at the grant date, i.e., "at the money," the use of the intrinsic method usually resulted in companies not reporting any compensation expense for their stock option plans.

Thus, stock option plans allowed companies to offer potential and existing executives large amounts of compensation without affecting the bottom line of their income statements. Although companies did not pay out any cash because of granting stock options, which has been used as an argument for not recognizing an expense, they did forego large amounts of cash by allowing executives to purchase the company's stock at a price below the current market value. Thus, companies did have an opportunity cost from granting executive stock options even though there were no out of the pocket costs.

As one of the responses to the scandals involving financial statement transparency issues in the early 2000s, the Financial Accounting Standards Board revised its existing standard for accounting for stock based employee compensation. The revised standard requires companies to expense executive stock option grants beginning in 2006. (SFAS 123R, 2004) The amount of expense recognized is based on the fair value of the options at the date they are granted. (Ibid., 2004) For publicly traded companies, fair value is to be determined by a fair value option pricing model.

When a company measured the total compensation expense arising from a stock option grant based on the fair value of the options at the date the board of directors awarded the options, but specified an earlier grant date in which the stock's market price was lower, the fair value of the options to the executives is likely to be greater than the amount initially measured. Hence, there may be a need to adjust the amount of expense recognized on the company's income statements for the affected periods.

A more serious financial reporting problem may arise for companies that granted stock options prior to 2006. As noted earlier, companies usually did not report any expense for the options granted prior to 2006 because of the option's exercise price being set equal to market price of the underlying stock at the date the option plan was awarded. For companies designating a grant date prior to the date option plan was awarded, the options may have been "in the money" at the award date because of the market price of the stock being lower at the backdated grant date. "In the money" stock option grants result in the recognition of compensation expense even when the intrinsic method is used. Thus, the company would be required to restate its financial statements to reflect the previously unrecorded expense. Since compensation expense is recognized over the vesting period of the option, improper backdating could result in the restatement of several years of financial statements. (Kanigher, 2006)

Effect of Backdating on Proxy Statements

Backdating stock options may also cause inaccurate disclosure in companies' proxy statements since publicly-traded companies are required to disclose executive officers' compensation in their proxy statements. Proxy disclosures would be inaccurate if the proxy statement indicated the stock options were granted "at the money", but because of backdating the grant date to a date when the market price of the stock was lower, the options were actually granted "in the money." (Kanigher, 2006)

Effect of Backdating on Income Taxes

Income tax returns filed by executives receiving stock option grants as well as the corporation granting the stock options may also be inaccurate because of backdating. For stock options qualifying as incentive stock options (ISO) under the Internal Revenue Code, the recipient employee is not subject to income taxes when the option is granted or exercised. Only the gain realized at the time the purchased stock is sold is subject to income taxes. The gain is treated as a long term capital gain which provides additional benefit to the executives.

However, the Internal Revenue Code requires that the exercise price of an ISO be set equal to the market price of the stock at the option's grant date. If the option's grant date is backdated to an earlier date when the market price of the stock is less than exercise price, the option will no longer qualify as an ISO for income tax purposes, but rather as an unqualified option. The recipient of an unqualified stock option is subject to income taxes at the time the executive exercises the option, and the gain realized is treated as ordinary income.

Changing a stock option plan from an ISO plan to an unqualified plan actually provides an advantage to the granting corporation. Corporations are not allowed to take deductions for stock option grants that qualify as an ISO. However, they are allowed to take deductions for stock option plans treated as unqualified plans. The amount of the deduction is equal to the amount ordinary income reported by the executives exercising the unqualified options.

Analysis of Companies Investigating Backdated Stock Options

Responding to the heightened interest in the backdating of stock options, The Wall Street Journal began publishing an online chronicle of companies that have come under scrutiny for potential backdated stock options. (WSJ Online, 2007) On January 4, 2007 the WSJ online report summarized the progress of backdating investigations of 127 companies. This paper analyzes the 127 companies from two perspectives. First, we reviewed the companies in order to determine a common profile based on four factors – 1) external auditor, 3) primary standard industrial classification, 3) geographic location of the company headquarters, 4) and prior disclosures related to material weaknesses in internal control pursuant to the Sarbanes Oxley Act. We then analyzed the results. This involved an analysis of the stock market returns, price/earnings ratios, and beta coefficients of the companies in the study in order to assess the capital market reaction to companies that have announced investigations of potential backdated stock options.

Commonalities of Investigated Companies-External Auditors

The current external auditors for the population of 127 potentially backdating firms were extracted from the most recent Form 10-K's. Table 1 below depicts the level of external auditor concentration observed.

Audit Firm Name	Number of Observations	Percent
Pricewaterhouse Coopers	34	27%
Deloitte Touche	32	25%
Ernst and Young	30	24%
KPMG	24	19%
All Others	7	5%
Total	127	100%

Given the dominance of the Big Four accounting firms as auditors of SEC registered companies, the observed dominance in our population by the Big Four was not unexpected. The population of potentially backdating companies also includes a large number of technology firms. As such, the level of auditor concentration could also be a reflection of industry specialization in technology. Hogan and Jeter found such auditor specialization is common to industries demonstrating high growth (like technology). (Hogan and Jeter, 1999). No research was found linking the choice of auditor to a higher likelihood of backdating of stock options.

Commonalities of Investigated Companies-Standard Industrial Classification

We identified the Primary Standard Industrial Classification (SIC) codes for all 127 potentially backdating companies. The largest concentration of companies in our population for a three digit SIC code was in industry group 737 (Computer Programming, Data Processing, and Other Computer Related Services). Thirty-one (24%) companies were in this classification. The second largest concentration of population companies in a SIC code was in industry group 367 (Electronic Components and Accessories). Twenty-five (20%) companies were in this classification. The only other SIC code with 10 or more companies in our population was industry group 357 (Computer and Office Equipment). Ten (8%) companies were in this classification. (Compustat, 2007) Noticeably absent from the top tiers of our SIC analysis are the “low tech” industries. We concluded that the SIC concentration of technology stocks in our population reflects the fact that most technology companies had compensation programs in place which emphasized stock options. The practice of backdating appears to be culturally accepted or an improper inducement of employers seeking to attract and retain talented employees. See Table 2 below for additional analysis.

SIC Code	SIC Description	Number of Observations	Percent
737	Computer Programming, Data Processing, and Other Computer Related Services	31	24%
367	Electronic Components and Accessories	25	20%
357	Computer and Office Equipment	10	8%
283	Drugs	5	4%

	All Others	56	44%
	Total	127	100%

Commonalities of Investigated Companies-Headquarter Location

We identified corporate headquarter addresses for all 127 companies in our population. Sixty-four of the companies (50%) were headquartered in California. The only other state with more than 10 corporate headquarters from our population was Massachusetts which had 14 (11%). (Compustat, 2007) This finding is also consistent with the high concentration of technology companies in California. See Table 3 below for additional analysis.

State	Number of Observations	Percent
California	64	50%
Massachusetts	14	11%
New York	9	7%
Texas	9	7%
New Jersey	6	5%
All Others	25	20%
Total	127	100%

Commonalities of Investigated Companies-Material Weaknesses in Internal Control

We reviewed the most recent Form 10-Ks filed for our 127 company population to determine if these companies had recently disclosed a material weakness in internal control pursuant to Section 404 of the Sarbanes Oxley Act (SOX). Of the 127 companies, 23 (18%) reported material weaknesses in internal control pursuant to SOX. Other researchers have also studied the level of reported material weakness in internal control. Shaw found that almost 11% of companies with market capitalization above \$75 million reported material weakness during a 16 month period ending in May 2005. (Shaw, 2005) The difference between Shaw's 11% finding and our 18% finding appears significant and suggests a trend of weaker internal control in companies with potential backdated stock options. We believe this finding merits additional

research, given the two studies covered different periods of time and our study did not exclude companies with capitalization below \$75 million.

Capital Market Reaction-Stock Market Returns

In order to evaluate the stock market's reaction to companies which have announced investigations into potential backdated stock options, we compared the 2006 change in the market value of the companies' common shares in this study with the 2006 change in an appropriate stock market index as a benchmark. We chose to use the change in the market value of the companies' common shares for the 2006 calendar year to compare with change in value of an appropriate stock index because all companies in the study had announced backdating investigations some time during the 2006 calendar year. .

We determined the change in the market value of the companies' common shares by creating a portfolio consisting of one share of stock in each of the 126 companies.² In order to find a suitable benchmark for our portfolio's stock price return, we calculated the average market capitalizations (market cap) for various published stock indexes and for our portfolio. We found that the Russell Midcap Index had an average market cap of \$7.621 billion and \$8.455 billion on December 31, 2005 and December 31, 2006, respectively. Our portfolio had an average market cap of \$7.677 billion and \$7.857 billion at the same two points in time. (Compustat) Accordingly, the Russell Midcap Index was chosen as the appropriate bench mark for our portfolio.

During the calendar year 2006, the Russell Midcap Index gained 13.53% in value and the portfolio of the 126 companies lost 3.58% of its fair value. The 17.01% negative difference in the average return on the portfolio in comparison to the average return on the Russell Midcap Index strongly suggests that the market reacted negatively to companies that had announced potential backdated stock options which resulted in a downward movement the those companies' stock prices. (Compustat, 2007)

More in depth analysis of the market's reaction is an area requiring additional study. One possible extension of our analysis would involve the construction of a reference portfolio (matched pairs) as demonstrated by Lyon, Barber, and Tsai. (Lyon et al, 1999)

Capital Market Reaction-Price/Earnings Ratio

² Stock price data were not available for one of the 127 companies and the average was calculated on the remaining 126 companies

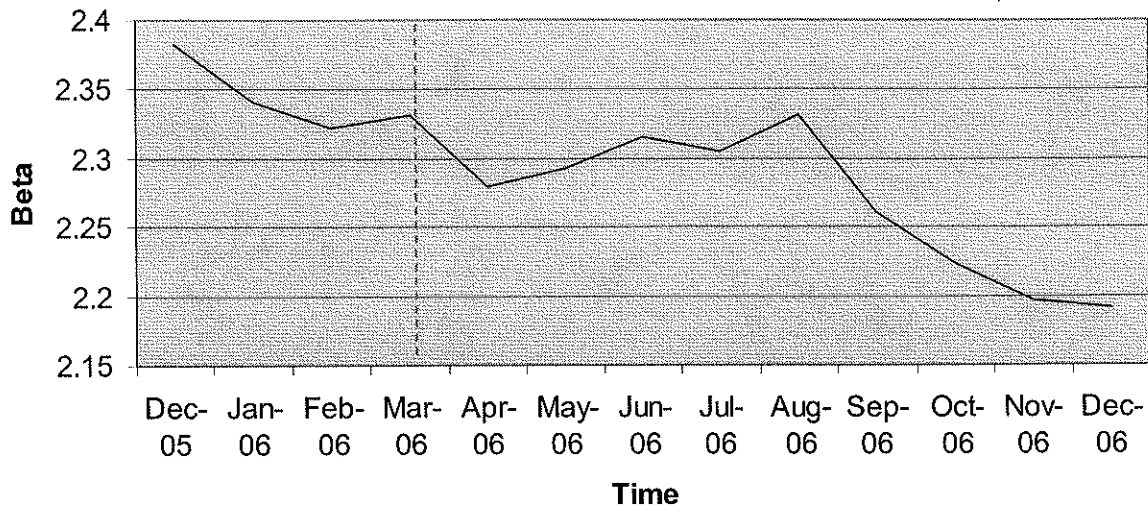
Our study also analyzed the impact that the investigations of potential backdated stock options had on company price/earning (PE) ratios. We calculated the PE ratios only for those companies in the study that did not have negative earnings. The non-negative subset of our population included 85 companies. The average PE ratio for these companies on December 31, 2005 (prior to announcement of backdating investigations) was 59.41. The average PE ratio for these companies on December 31, 2006 (after announcement of backdating investigations) was 43.02 or a 27.6% decrease since the beginning of the year. In comparison, the average PE ratio for Russell Midcap Index went from 18.66 to 19.23, or an increase of 3.1% during the same period of time. (Compustat, 2007) These results also provide evidence that investors reacted negatively to companies that had announced potential backdated stock options

Capital Market Reaction-Beta Coefficient

The beta coefficient of a company's stock is a common measure of risk for that stock relative to other investment opportunities. In general, an investment with a beta coefficient of 1.00 is considered to have average risk. Betas above 1.00 are considered to be more risky than average while stocks with betas below 1.00 are considered less risky than average. To assess the level of risk associated with the stocks in our population, we calculated the average beta coefficient at the end of December, 2005 for the 125 company portfolio³. At that time the average beta for stocks in our portfolio was 2.38. We also calculated the average beta for the 125 companies for each month in 2006. The average beta coefficient at the end of December 2006 was 2.19. Chart 1 graphically displays the results of these calculations below. (Compustat, 2007) Chart 1 also includes a superimposed vertical broken line to indicate the first public disclosure of investigations of potentially backdated stock options

³ Beta Coefficient data was not available for two of the 127 companies and the average was calculated on the remaining 125 companies.

Chart 1
Average Beta Coefficient



One can note that the average beta coefficient for the 125 companies has decreased from approximately 2.33 when the first public announcement about improper backdating was made in March 2006 to 2.19 by the end of 2006. The 6% decrease in the beta coefficient since the first public announcement about improper backdating indicates that the improvement in transparency arising from disclosures of backdating practices has caused the market to view the 125 companies as less risky.

Obviously, a stock's beta coefficient is not the only means to measure risk. Other factors have at least a contributing effect. Fama and French's research found other factors such as the size of a firm's market equity and the firm's use of leverage. The ratio of book equity to market equity and the ratio of earnings to price are also part of the relationship of a firm's risk and its return to shareholders. (Fama and French, 1992) On the other hand, Lintner, in his research, found beta to be the foremost factor. Lintner's research on beta as the main risk driver, still today, remains a seminal piece in the explanation of the relationship of risk and return on stocks. (Lintner, 1965)

Conclusion

Our analysis yielded several significant findings. Our initial review focused on identification of a common profile among companies investigating potential backdated stock options based on four (4) factors 1) external auditor, 2) primary Standard Industrial Classification, 3) geographic location of the company's headquarters, and 4) prior disclosures related to material weaknesses in internal control pursuant to the Sarbanes Oxley Act. The findings are:

- 1) Companies now investigating potential backdated stock options in prior periods did not predominantly rely on the same external auditor. The audits of these firms were completed primarily by the "Big Four" accounting firms and no single firm had more than 27% of this audit market.
- 2) Companies now investigating potential backdated stock options in prior periods are in most cases "high tech" growth-oriented companies. Our SIC analysis indicated over 50% of the companies were in "high tech" classifications. Analysis of reasons (such as cultural or competitive reasons) that lead these companies to be involved in the backdating of stock options is an area of future study.
- 3) Companies now investigating potential backdated stock options in prior periods are primarily headquartered in California. Given the concentration of "high-tech" companies in California and in our population, the finding that 50% of our population are California companies is not surprising. Analysis of reasons (such as the sharing of compensation consultants or regional expectations of employees) that lead these companies to be involved in the backdating of stock options is an area of future study.
- 4) Companies now investigating potential backdated stock options in prior periods have a higher percentage of companies (18%) reporting a material weakness in internal control than their peers. (Eleven percent of all companies with a market capitalization above \$75 million that were studied during a 16 month period ending in May, 2005 reported a material weakness in internal control.) This seven percent difference appears significant and suggests a trend of weaker internal control in companies with potential backdated stock options. We believe this finding merits additional research, given the two studies covered different periods of time and our study did not exclude companies with capitalization below \$75 million

Our second level analysis focused on capital market reaction to companies investigating potential backdated stock options in prior periods. The findings are:

- 1) The stock of companies investigating potential backdated stock options dramatically underperformed their peers during the period the investigation was announced. Our analysis found the average stock price of companies investigating potential backdated stock options underperformed the Russell MidCap Index by over 17% in the year the investigation was reported. Considerable research has been completed on the market's overreaction to such bad news. Evaluating the stock performance of these companies in a future period is an area of future study.
- 2) The average Price/Earnings (PE) ratios of companies investigating potential backdated stock options dropped from 59.41 to 43.02 in the year the investigation was reported. The Russell Midcap Index peer group PE went from 18.66 to 19.23 during the same period. Evaluating the stock performance of these companies in a future period is also an area of future study.
- 3) The average beta coefficient for the portfolio of companies investigating potential backdated stock options decreased in the year the investigation was reported. The average beta decreased from 2.38 to 2.19 in the one year period. Given that the calculation of beta involves five years of historic data, changes in beta are generally gradual and not precipitous. However, we believe the decrease in risk as measured by beta can be attributed, in part to market reaction to disclosure of potential backdated stock options. Given the multi-year data requirements of beta, continued analysis of beta coefficients in future years is an area of future study.

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