Essays on top management and corporate behavior

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Publication date
2010

Chapter 3

Backdating or Otherwise Manipulating CEO Stock Option Grants

The academic studies suggest that the practice of top executive stock option backdating was used to be widely adopted among firms. In this chapter, I study whether this option backdating practice is associated with inferior corporate governance. e.g. lax board monitoring or executive entrenchment. Moreover, I examine firm-specific characteristics that might lead to the decision and whether its rationale deviates from that of the option repricing mechanism.

3.1 Introduction

Yermack (1997) first identifies the pattern of abnormal stock price return around executive stock option grants. More specifically, firms' stock returns are abnormally high immediately after these options are granted. Due to accounting convention and tax considerations, stock options are generally granted at the money, i.e. to set the exercise price equal to the market price[1]. It thus suggests that, other than pure luck and/or the ability to forecast stock prices, firms timing option grants or firm-related announcements is the most likely explanation, the so-called "springloading". Later, several studies (e.g. Aboody and Kasznik, 2000; Chauvin and Shenoy, 2001; Lie, 2005; Heron and Lie, 2007) further show that the stock returns are abnormally low before these option grants. Lie (2005) and Heron and Lie (2007) argue that, instead of timing grants and announcements, it is more likely that those stock options in question are actually backdated. In other words, with hindsight, the grant dates of current

[1] See Heron and Lie (2007) for detailed discussions.

options are changed to more favorable dates, i.e. with lower striking prices.

These findings, together with the comprehensive newspaper coverage (e.g. Wall Street Journal, 2005) starting from 2004, reveal this option backdating practice to the public and further draw regulators' close attention. To them, without revealed to shareholders, backdating is simply a vicious way of stealing money from the firm. More importantly, by means of resetting existing option grants to a date with a favorable price, executives are in fact rewarded for poor performance, which can be viewed as an example of managerial rent-seeking. Even worse, the anticipation of possible option backdating is detrimental to managerial incentives.

Until March 2007, there are more than 250 companies that are under internal reviews or (in)formal investigations by the SEC (U.S. Securities and Exchange Commission) and/or U.S. Department of Justice regarding the accounting of option grant dates. It thus seems that option backdating is not a practice conducted by merely a few companies with greedy executives. Heron and Lie (2009) estimate that 13.6% of all top executive (CEO) option grants between 1996 and 2005 are backdated or otherwise manipulated. For unscheduled and at the money grants, this estimate increases to 18.9%. Before the SOX (Sarbanes-Oxley Act) of 2002, this fraction is 23%, and 10% thereafter. On top of that, at the firm level, they estimate that 29.2% of firms manipulate stock options granted to their top executives. Nevertheless, even for those firms involved with option backdating, not all of their grants are backdated or otherwise manipulated. Obviously, this extensive but intermittent use of option backdating or otherwise manipulation is of great interest to both the academics as well as the regulators.

In another vein, recent research studies whether option backdating is a result of weaker corporate governance[2]. For instance, Bizjak et al. (2009) find that board interlock significantly facilitates the spread of backdating practice across firms. Other factors such as younger CEOs, higher stock volatility, and larger managerial holdings of stock and options

[2]See Bebchuk, Cohen, and Ferrell (2004) and Gompers, Ishii, and Metrick (2003) for the construction of the GIM and Entrenchment index, respectively.

all attribute to backdating likelihood. Collins el al. (2009) study the relationship between a set of governance variables and the decision to backdate. They find that weak governance, higher managerial option holding, and board interlock contribute to the backdating behavior. Having directors who receive option grants on the same day as the CEO also prompts this opportunistic behavior.

This chapter investigates the rationale behind this practice. More specifically, I examine what firm characteristics might lead to the decision to manipulate top executive stock option dates. Different from Heron and Lie (2009), Bizjak et al. (2009), and Collins et al. (2009), I take into account firm performance after manipulating options, which further allows for the comparison with option repricing mechanism. Option repricing mechanism is designed to "re-incentivize" managers by lowering the strike prices of previously granted options that are significantly out of the money. Technology, trade and service oriented firms (Chidambaran and Prabhala, 2003), along with small firms (Chance et al., 2000), conduct option repricing more. Sauer and Sautner (2008) find option repricing is common for young and fast growing firms that encounter a sharp decline in performance in the two years before repricing, and cash compensation is not reduced accordingly when repricing occurs. After repricing decision that is affected by corporate governance structure, performance improves significantly.

In contrast with option repricing mechanism as well as managerial power view, the alternative hypothesis in this chapter is that, for a cash-strapped firm with high stock price volatility, option backdating is to retain outperforming executives. To test the hypothesis, I use a sample of 6,836 stock option grants that are issued to the top executives in the Standard & Poor's (S&P) 1500 companies between 1999 and 2007. I estimate the likelihood of option manipulation based on the assumption that, in the absence of backdating or other types of option grant manipulation, the distributions of stock price returns during the month right before/after grant dates should be similar. Namely, without option manipulation, the distribution of return differences should not be significantly different from zero. Alternatively, positive abnormal return difference imply the existence of option

manipulation.

I calculate abnormal returns as the difference between the stock returns of the granting firm and the ones predicted by the Fama and French three-factor model. I primarily focus on the grants whose abnormal return differences rank above the 90% decile in the sample with positive values, which I believe provides a more conservative estimate while reducing potential noises in the data[3]. In the following robustness checks, I use the positive abnormal return difference as an alternative proxy for manipulation. Moreover, I conduct additional testing for two sub-samples, i.e. the pre- and post-SOX period, and see whether (and if so, how) the passage of this Act affects the manipulation decision.

In terms of the determinants, I use the simple OLS model to estimate the manipulation likelihood. Basically, what I find is that, during the period of 1999-2007 as a whole, when smaller, younger, and better governed firms underperform in the previous year and encounter high stock volatility, the stock options granted to top executives who own more stock option components in their total compensation are more likely to be manipulated. Once controlling for the industry and year fixed effects, only the CEO option holding variable loses its influences on the option manipulation decision. The evidence thus suggests that option manipulation is not a result of weaker corporate governance, despite it can potentially be related to previous inferior market performance.

More interestingly, disparate patterns emerge between the pre- and post-SOX period. Before the passage of the 2002 SOX, firms that are smaller, younger, and better governed with higher cash holdings and stock volatility, are prone to manipulate option grant dates. Once controlling for both fixed effects, what remains is the (negative) effects of firm age only. After the 2002 SOX, firms that are smaller and better governed, with more cash at hand but having inferior performance, tend to have manipulated grants. Once controlling

[3]Heron and Lie (2009) estimate the likelihood by using the absolute difference and a dummy whether this difference is positive. Collins el al. (2009) classify a grant as backdated if the grant date stock price falls in the lowest decile of the stock price distribution over a 240-day window surrounding the option grant date. Bizjak et al. (2009) identifies grants as being backdated if the market-adjusted stock price declined at least 10% in the 20 trading days prior to the grant and increased at least 10% in the 20 trading days after the grant.

for both fixed effects, the (negative) effects of firm size, return on assets, and both the GIM index and entrenchment index, still remain. Taken together, these findings indicate that the practice of option manipulation is not a result of weaker governance or management entrenchment, regardless of the 2002 SOX. However, thereafter it is correlated with inferior performance. In the robustness checks, I use the positive abnormal return difference, and most of the results disappear.

Regarding the consequences, other than the legal ramifications, I am mainly interested in the relationship, if any, between this behavior and the subsequent firm performance, in which I use the two-step treatment-effects model to estimate because the selection process is not random. During the entire sample period, manipulating grants is positively related with performance, which suggests a favorable role involved. Similarly, I find different results in the sub-sample periods. More specifically, this positive relationship is mainly driven by the grants in post-SOX period whereas no significant relationship is found prior to the 2002 SOX. In addition, after the 2002 SOX, the firm-specific selection process of the manipulating behavior involves smaller firm size, higher dispensable cash ratio, poor previous performance, and better corporate governance. These attributes seem to resemble the option repricing mechanism to re-incentivise managers. As for the pre-SOX period, smaller and younger firms with more cash holdings, higher stock volatility, and fewer anti-takeover provisions are more likely to manipulate grant dates. Since it is not related with performance (both pre- and post-manipulation), it is not obvious what rationale might lead to option manipulation.

At the end of this chapter, I use a sub-sample of 126 firms that are under (formal or informal) investigations or internal probes regarding option backdating related accounting rule violations and/or tax evasions to test the robustness of the findings. The testing results show that, regardless of the classification methods in use, for this subset of firms, high stock volatility (and to a lesser extant, lower firm age) is the main attribute that explains this practice, which is not a result of poor corporate governance.

All in all, I find evidence that rejects the null hypothesis that option backdating or

otherwise manipulation is associated with poor corporate governance, but it can be linked to inferior performance to some extent. More specifically, when taking into account both the pre- and post-performance, during the pre-SOX period, the option manipulation decision is not related with firm performance and thus not a result of poor performance. After the SOX is passed, this practice seems more of an option repricing mechanism. In addition, I do not find evidence of weak corporate governance during the selection process regardless of the sample period. In other words, option manipulation is not a result of a lax board monitoring or management entrenchment.

The main contribution of this chapter is three-fold. First of all, unlike extant studies on option backdating, it considers the firm performance both before and after the decision to backdate or otherwise manipulate top executive option grants. Moreover, unlike Collins el al. (2009), I view the option backdating or otherwise manipulation decision as a self-select treatment, instead of a random variable. Therefore, the model is more capable of better capturing the mechanisms involved in the selection process as well as the treatment effects from the act of manipulation itself. Lastly, it helps to identify firms that are more attempted to this practice, and thus might be of interest to the regulators.

The remainder of this chapter proceeds as follows: Section 2 gives a brief literature review related with backdating. Section 3 contains hypotheses to be tested. Section 4 describes the sample construction and the methodology applied. Section 5 shows the estimation and testing results. Section 6 conducts the sub-sample analysis. Section 7 summaries the findings and concludes. Section 8 displays the tables and figures.

3.2 Research on Executive Stock Option Grants

Hall and Murphy (2002) conduct a certainty-equivalent analysis to determine the cost, value, and pay-for-performance sensitivity of vested stock options owned by undiversified and risk-averse managers. They show that firm's cost of option-granting typically exceeds its value to managers. The incentives provided by options are maximized with a strike price at or near the grant-date market price when the grant is an add-on, ceteris paribus.

However, if managers receive options to compensate reduced cash income, incentives are maximized with a strike price close to zero. Thus, under this framework, some common practices, such as setting higher performance benchmarks by issuing premium options or refraining from repricing following stock price declines, are not necessarily in the interests of shareholders.

Palmon et al. (2004), by taking effort aversion into account, evaluate the common practice of at-the-money executive stock options. They simulate the firm's decisions and the manager's effort choice under various compensation schemes and identify what are optimal. They find that when abstracting from tax considerations, it is optimal to grant in-the-money options. Otherwise, issuing at-the-money options might be optimal. Both strategies hold regardless of strike price linked to market situation; in addition, issuing options with benchmarked strike prices usually dominates options without.

Bizjak et al. (2007) find that board interlock significantly facilitates the spread of backdating practice across firms. Other factors such as younger CEOs, higher stock volatility, and larger managerial holdings of stock and options all attribute to backdating likelihood. But, little evidence relates backdating to poor corporate governance. Collins el al. (2007) argue weak governance, higher managerial option holding, and board interlock contribute to backdating. Having directors who receive option grants on the same day as the CEO also increases the likelihood. Narayanan et al. (2007) discuss economic impacts of legal, governance, tax, disclosure, and incentive issues thanks to the revelation of backdating. Using a sample of firms already implicated in backdating, they find that the revelation of backdating results in a loss of 8% to shareholders, i.e. around U.S.$500 million per firm. In contrast, the potential gain from backdating (for CEOs) is estimated under U.S.$0.6 million per firm annually.

Sauer and Sautner (2008) examine the relations between option repricing, performance, and corporate governance in the Europe. They find repricing is common for young and fast growing firms that encounter a sharp decline in accounting and stock price performance in the two years before repricing, and cash compensation is not reduced accordingly

when repricing occurs. After repricing decision, which is affected by corporate governance structure, performance improves significantly.

3.3 Hypotheses

In this chapter, my alternative hypothesis is that, for a cash-strapped firm that faces high stock price volatility, option backdating is one way to reward and/or retain outperforming executives. In particular, I focus on the following two null hypotheses for testing,

- H1: Option backdating (manipulation) is associated with weak corporate governance.
- H2: Option backdating (manipulation) is associated with inferior performance.

3.4 Sample and Methodology

3.4.1 Sample

Following Heron and Lie (2009), I obtain my sample of CEO stock option grants from the Thomson Financial Insider Filing database, which provides all insider transactions reported on SEC forms 3, 4, 5, and 144 in the U.S. I first restrict my sample option grants to transactions[4] that are granted or awarded to CEOs between January 1996 and November 2007[5]. I require stock returns to be available from 20 trading days before to 20 trading days after the grant date. I further eliminate duplicate grants that occur on a given grant date so that there is only one grant for a given date and company combination, i.e. firm-date observation. This leaves 26,092 firm-date observations that corresponds to 5,398 companies. In the end, I match these transactions with available corporate governance data in RiskMetrics

[4] I include transactions with derivative title as: OPTNS, EMPO, ISO, NONQ, CALL, WT, DIRO, RGHTS, and SAR. In the meantime, all the sample transactions have a cleanse indicator of R ("data verified through the cleansing process") or H ("cleansed with a very high level of confidence"), and C (A record added to nonderivative table or derivative table in order to correspond with a record on the opposing table.).

[5] In that case, a month of subsequent stock returns would be available in the 2007 Center for Research in Security Prices database.

Governance database[6], accounting data in Compustat database[7], and stock market data in CRSP database[8]. My final sample consists of 6,836 (or 6,444 with available entrenchment index data) CEO option grants across 1,303 companies among S&P 1500 companies in the U.S. during the period of 1999 and 2007.

Table 1 shows the descriptive statistics of my sample. In Panel A, the market value of slightly more than half of the firms is less than 2 billion U.S. dollars. In terms of industrial classifications, as shown in Panel B, the sample firms are concentrated in the manufacturing industry (21.18%), followed by financial industry (13.48%) and electronics industry (11.33%). When it comes to the option grants, the electronics industry has the most options being potentially manipulated (25.56%), while the manufacturing industry (18.34%) and the software industry (10.00%) follow suit, as illustrated in Panel C.

In terms of the timing of the option grants, Panel D shows that, except in 1999 and 2000, the issuance of option grants is stable over time, roughly between 10% and 14%. Moreover, consistent with the previous studies, the estimated number of manipulated options is in general higher before 2003, the year after the SOX takes effect. Particularly, in 2000, approximately 11.45% of the option grants are estimated to be manipulated, which is close to the findings in Heron and Lie (2009). Panel E shows the descriptive statistics of the variables that are adopted in the ensuing analysis.

3.4.2 Methodology for Estimating the Likelihood of Grants That Are Backdated or Otherwise Manipulated

Intuitively, when there exists no opportunistic grant timing or opportunistic timing of information flows around grants, the stock returns before and after grant dates should display similar patterns. In other words, in the absence of intentional or strategical timing, the

[6] It publishes detailed listings of up to 30 corporate governance provisions for firms in corporate takeover defenses for more than 4,000 firms since 1990.

[7] It provides annual and quarterly income statement, balance sheet, statement of cash flows, and supplemental data items on publicly held companies.

[8] It maintains a comprehensive collection of security price, return, and volume data for the NYSE, AMEX and NASDAQ stock markets, among others.

distribution of the difference between the returns for a given number of days after and before the grants should be centered around zero. Similar to Heron and Lie (2009), I use this reasoning to estimate the likelihood of grants that are backdated or manipulated.

As a matter of fact, the estimate of the abnormal stock price movements around the grant dates might be the results of various manipulative practices, such as option backdating, option springloading, and option repricing. Nevertheless, Heron and Lie (2007) argue that the majority of the abnormal returns around the declared grant dates suggest option backdating at play. In addition, the abnormal stock price patterns should vary depending on the purposes of these manipulative practices. More specifically, for option springloading, the abnormal stock returns before and after the grant dates should not be different from zero with statistical significance until the grant dates. When comparing option repricing with option backdating, the former's abnormal stock returns should sustain for a longer period with less drastic intensity because of its incentive purposes.

Following the event study approach, for the sample CEO option grants, I estimate the cumulative abnormal returns as the difference between the stock returns of the granting firm and the returns predicted by the Fama and French three-factor model. The estimation window lasts 255 days, ending 46 days before the grant date. On the other hand, the event window contains 41 days in total, starting from 20 trading days before and ending 20 trading days after the event. The reason to choose 20 trading days is because previous studies suggest that most of the abnormal returns around grants happen during the month before and after the option grants. I use the abnormal return difference before and after the grants as my estimate of the likelihood of option manipulation. In the end, I classify option grants as backdated or manipulated when their abnormal return differences rank exceeding the highest decile[9] of the sample options that have positive differences[10].

[9] Heron and Lie (2009) estimate on average 18.9% of all top executive option gratns are manipulated, with a fraction of 23% before and 10% after the 2002 SOX takes effect. Therefore, the choice of top 10% threshold provides a conservative estimate of option manipulation.

[10] By using this top 10% threshold, 21.58% of the sample firms are estimated to have manipulated their CEO stock option grants between 1999 and 2007. It thus provides a conservative estimate, compared with 29.2% between 1996 and 2005 in Heron and Lie (2009).

3.5 Empirical Results

3.5.1 Determinants of Option Manipulation

Mean-Test Analysis

Table 2 shows the testing results of univariate mean comparison analysis of CEO stock option grants[11]. On the whole, firms who have a higher propensity to manipulate their CEO option grants are smaller and younger. In addition, in the year before the grants, they tend to have more dispensable cash, lower return on assets, better governance structure, with a lower degree of managerial entrenchment. In the year of the grants, these firms are more likely to encounter higher stock volatility while their CEO have more stock option holdings relative to their total compensation.

Regression Analysis

I carry out the following OLS model to examine the relationships between some firm-specific characteristics and the option manipulation propensity,

$$Prob(MANIPULATE_{it}) = \alpha_0 + \beta_1 SIZE_{it-1} + \beta_2 AGE_{it} + \beta_3 CASHRATIO_{it-1} + \beta_4 GROWTH_{it-1} + \beta_5 PROFITABILITY_{it-1} + \beta_6 VOLATILITY_{it} + \beta_7 CEOHOLDING_{it} + \beta_8 GOVERNANCE_{it-1} + \varepsilon_{it}$$

, where MANIPULATE is a dummy variable, assigned to 1 for firm-date observations whose abnormal stock return differences rank above the top 10% of the entire sample with positive differences and 0 otherwise.

Table 3 displays the correlation matrix of the explanatory variables, and Table 4 displays the estimation results[12]. Panel A shows the estimates during the whole sample period, while Panel B presents the findings in two different sub-periods, i.e. before and after September 2002 in which the SOX is passed. The only difference in Specification (1) and (2) is that the former adopts GIM index while the latter adopts Entrenchment index to measure the

[11] I find similar testing results for median comparison anaysis (not reported).
[12] The results hold under Probit estimation (not reported).

governance level. Specification (3) and (4) further control for industry and year fixed effects for Specification (1) and (2), respectively.

When looking at the entire sample period, I find that smaller, younger, and better governed firms tend to manipulate their CEO option grants more. Not only that, when the firm underperforms in the previous year, and has higher stock price volatility this year while its CEO happen to have more stock option components relative to total compensation, the likelihood of options being manipulated is higher. Note that after controlling for the industry and year fixed effects, only the CEO option holding variable loses its influences on the propensity for option manipulation. It thus suggests that, on average, option manipulation is not a result of weaker corporate governance, but can be related to previous inferior firm performance.

More interestingly, once dividing the sample period into two with the 2002 SOX, disparate patterns emerge. Prior to the passage of the 2002 SOX, being smaller, younger, and better governed with higher cash holdings and stock volatility, is associated with a higher tendency to manipulate option grants. Once controlling for the industry and year fixed effects, only the (negative) effects of firm age remain. On the other hand, after the SOX takes effects in 2002, firms that are smaller and better governed, with more cash at hand, and facing inferior performance, tend to have manipulated grants. Once controlling for the industry and year fixed effects, the (negative) effects of firm size, return on assets, and both measures of corporate governance remain. Therefore, all taken, the evidence suggests that option manipulation is not a result of weaker governance or managerial entrenchment, regardless of the passage of the 2002 SOX, but, thereafter it is associated with inferior performance.

3.5.2 Option Manipulation and Performance

After exploring the determinants, in this section I attempt to examine the consequences that might result from option manipulation behavior. In particular, other than the legal ramifications, it is clearly that, for shareholders, what really matters is how the act might

influence performance, if any, which is measured by return on assets. I use the treatment-effects model (with two-step consistent estimates) to explore the relationship. Since the decision for option manipulation is not random, the choice of treatment models that consider the selection process is more appropriate compared with other simple linear models.

Similar to the empirical strategy in the previous section, in Table 5, Panel A displays the estimates during the whole sample period, and Panel B shows the findings in two different sub-periods, i.e. before and after the 2002 SOX. In order to understand better, the numerical results are further summarized in Table 6, which provides the predicted signs for the firm-specific factors that might influence the decision for option manipulation once taking into account both the industry and year fixed effects. Without distinguishing between prior- and post-SOX period, the act of manipulating CEO option grants is positively related with performance, suggesting a favorable role involved.

However, once again intriguingly, I find different results in the two sub-sample periods. More specifically, this positive relationship is mainly driven by the grants in post-SOX period whereas no significant relationship exists prior to the SOX taking effects. Furthermore, after the 2002 SOX, the firm-specific selection process of the manipulating behavior involves smaller firm size, higher dispensable cash ratio, poor previous performance, and better corporate governance. It thus seems to reflect the option repricing mechanism that provides incentives for managers whose existing options are deep out of the money. As for the pre-SOX period, smaller and younger firms with more cash holdings, higher stock volatility and fewer anti-takeover provisions are more likely to manipulate CEO option grant dates. Because it is not directly linked to performance (both before and after the manipulation), it is not obvious to me what the considerations behind might be.

In summary, once taking into account post-performance, during the pre-SOX period, option manipulation behavior is not a result of poor performance and is independent of post-performance. After the SOX is passed, this act resembles more of the option repricing mechanism. On top of that, I do not find evidence of weaker corporate governance and/or higher management entrenchment in the selection process, regardless of the sample period

under study. As a result, option manipulation does not result from a lax board monitoring or executive entrenchment.

3.5.3 Robustness Checks

As a robustness check, I relax the top 10% threshold and classify grants as manipulated as long as they have positive abnormal return differences. Table 7 and Table 8 show the estimation results for the determinants as well as the relationship between option manipulation and performance, respectively. On the whole, compared with the findings in the preceding analyses, most of the estimates are statistically insignificant, and the explanatory power of these regression models decrease dramatically. Therefore, it suggests that the choice of this 10% threshold is less of a concern about the misspecification issues.

3.6 Sub-Sample Analysis

In this section, I use a sub-sample of 126 firms, under (formal or informal) investigations or internal probes regarding option backdating related accounting rule violations and/or tax evasions[13] to further test the robustness of the previous findings. In addition, I estimate the market reaction to the press that reveals the practice of option backdating, which can be regarded as reputation risk to firms. I also examine if those firms commit other corporate frauds more in the past. In the end, I investigate possible drivers behind this reputation risk.

3.6.1 Case Study: Brocade Communications Systems

Founded in 1995, the Brocade is a data storage-networking company in San Jose, California. It provides storage switches that function as virtual traffic officers and allow for interconnection between storage devices. Gregory Reyes, who works as its CEO since mid-1998, resigns in January 2005, at the same time the company announces to restate financial statements

[13] I obtain the firm list from Wall Street Journal "Perfect Payday" report (the June 12, 2007 version), http://online.wsj.com/page/perfectpayday.html.

from 1999 to 2004 because of improper accounting for previous options granted to new or part-time employees, employees on leaves of absence or in transitory roles with the company. One of its most remarkable restatements is for fiscal 2000. During that year, Brocade actually losses $951.2 million, instead of the originally reported $67.9 million earnings. The $1 billion difference is related to its stock-based compensation and associated with income tax adjustments. After resignation, Mr. Reyes remains as consultant and director within the company for several months.

Similarly, some of Mr. Reyes' options are granted on highly favorable dates. For example, one grant is dated on October 1, 2001, at the time when its stock price reaches to the yearly lowest level; also, two other grants come at monthly stock lows. Even though Mr. Reyes does not exercise any options after the company goes public in 1999, he makes a fortune by selling at least $380 million of shares before its IPO. On May 16, 2005, Brocade discloses that the Justice Department and the SEC are investigating its option-granting practices. After two years, on May 31, 2007, Brocade agrees to settle with the SEC and pays $7 million.

Besides, since April 2006, Brocade has been under a class action lawsuit, lead by The Arkansas Public Employee Retirement System who claims a $1.9 million loss, stating that Brocade recruits employees by giving them offer letters with early, mostly inaccurate, starting dates for employment. For example, on January 6, 2000, David Smith receives an offer letter from Mr. Reyes and is employed as a vice president. His compensation consists of a base salary of $240,000 a year and 200,000 options, with the grant date of his first day of employment. However, Mr. Smith states that he does not start working full-time in Brocade until April, rather than the supposedly January starting date. Between 2000 and 2001, Mr. Smith pockets $7.4 million from the sale of his share holding.

The suit also alleges that Mr. Reyes has the authority to grant options "as a committee of one" and that he sometimes holds "ad hoc" board meetings with other executives to approve option grants. In the beginning, Mr. Reyes denies any backdating practice under his watch, but now he recognizes its existence. Nevertheless, facing criminal fraud charges

and millions of dollars in fines, he still defends himself by stating that its purpose is to retain and recruit talented employees, not to defraud shareholders. The one-person stock option committee is to facilitate the hiring and retaining procedure, and is legal under the law of Delaware, where Brocade is incorporated. What's more, he argues that he does not realize its accounting implications, is not directly involved in awarding backdated options, and investors does not consider them material, either.

3.6.2 Sample

Table 9 shows the summary statistics of these 126 sub-sample firms in firm size and industry classification. The size distribution in this sub-sample is similar to that in the sample universe. However, more than half of the sub-sample firms (55.56%) are in the information technology sector (including Computer & Electronic Parts industry and Software & Technology industry), in contrast with the sample universe (18.73%)[14].

To form a reference group for testing, for each sub-sample firm, I construct a matched portfolio that consists of at most two companies by size (total assets) and industry (four-digit SIC codes) on an annual basis between 1999 and 2006.

3.6.3 Testing Results

Firm-Specific Attributes of Backdating

i. Mean-Test Analysis

First I compare corporate governance structures between the sub-sample and the market as a whole in 1998 and 2006[15]. Panel A in Table 10 provides supporting evidence that backdating firms in general have at least as good corporate governance as the market average. For instance, in 2006, except the Delay category of GIM sub-index, backdating firms have significantly stronger shareholder rights. However, note that, these differences in var-

[14] This ratio increases to 35.56% in terms of option grants in the sample.

[15] I pool all companies in the database with available data to form the market. I do not conduct year-by-year testing because corporate governance across firms is stable over time.

ious corporate governance measurements seem to shrink with time. When it comes to the comparison between the sub-sample and its peer group, Panel B in Table 10 demonstrates similar despite weaker, patterns as previous findings in market comparison. Regardless, these results show that firms under option backdating related probes do not have inferior corporate governance, and these firms are not subjected to (high) managerial entrenchment, either.

Moreover, I compare accounting performance, stock volatility, and financial constraint between the sub-sample and its peer group on an annual basis between 1998 and 2005. In Table 11, Panel A shows that there is no significant difference between both types of firms in any of these three attributes over time. Panel B shows the testing results on stock return and volatility between the sub-sample and the market that I use three different proxies, i.e. S&P Composite Index, value weighted and equally weighted NYSE/AMEX/NASDAQ Index. Generally speaking, the sub-sample firms beat the market except in 2002, and their stock prices are more volatile than the market.

ii. Regression Analysis

After separate mean-tests of several firm attributes, I conduct two sets of regression analysis[16] to test whether the rationale behind option backdating or otherwise manipulation in Section 3.5 also holds for this sub-sample of firms. Due to small sample size, I allow for three cut-off points to classify stock options that are estimated to be backdated. In Table 12, Panel A shows the number of grants that are classified as backdated. Threshold (1) and (2) refer to the criteria in which the abnormal stock return differences exceed 90% and 75% of the distribution of the entire sample (the universe of option grants). Threshold (3) relax further to classify options that are backdated as long as their abnormal return differences are positive. Note that the peer group for each sub-sample firm in the regression analysis is formed in 2005 data only in order to avoid spurious interpretations.

These two sets of regression analysis differ in how I classify stock options as backdated.

[16] The model specification is identical with the one specified in the regression analysis of Section 3.5.1.

In Panel B, I choose stock options in the sub-sample firms only, and classify those whose abnormal return differences exceed specific threshold as being backdated, as illustrated in Panel A with the red dotted square. Alternatively, in Panel C, I take into account the stock options in the peer groups. Similarly, I classify options in the sub-sample firms whose abnormal return differences exceed some threshold as being backdated. However, different from Panel B, options classified as non-backdated are options in the peer groups only whose abnormal return differences do not exceed the same threshold, as illustrated in Panel A with the blue dotted circle.

In other words, in Panel B, the estimates provides what might lead to the decision to backdate CEO stock options within the sub-sample firms, while the estimates in Panel C give a more general explanation why to backdate. Regardless of which estimation method in use, either linear probability model or binomial probit model, the only firm attributes that matter are stock volatility (+) and corporate governance (-), and firm age (-) when taking options in peer group into consideration. The evidence suggests that firms backdate their CEO stock options in order to take advantage of stock volatility. This compensation has little to do with past performance, future growth opportunity, CEO incentives, and financial constraint. Therefore, it is not obvious what the reward is for, but it is not a result of poor corporate governance. In addition, the findings in this sub-sample analysis indicate a rationale that deviates from what Section 3.5 suggests, despite some consistency.

Backdating and News Announcement

In this section, I adopt the Event Study methodology to test if the press revealing backdating practice brings negative impacts on firms. To identify the event date, I use three different sources of news release, which are Factiva[17], WSJ, and one with the earlier date between the former two. Table 13 summarizes the press announcement dates from these two sources, together with the probe order and rulings announcement dates of individual firms. The

[17] It covers various sources of information including major wire services, U.S. business publications, national and regional newspapers, and trade publications.

event window starts from 30 trading days before through 30 trading days after the event, and the estimation period is 255 days ending 45 days before the event. Using market- and market risk-adjusted return models (with both equally- and value-weighted market index), I calculate the abnormal stock returns as the difference between the realized returns and the ones predicted by model. Generally speaking, it should be more appropriate to use the last source of news release, i.e. the earlier date between Factiva and WSJ, for analysis since people use massive sources of information, which also spreads quickly nowadays. Hence, I take it as my benchmark case for the remainder of this section.

By using equally-weighted market index and market adjusted return model, I find that on date 0, there is a -2.09% abnormal return and a -7.36% cumulative abnormal return (CAR) for the sub-sample firms. In addition, the whole event window is divided into three sub-periods, i.e. pre-event, event, post-event. Fig. 1 and 2 displays the CAR pattern during the event window period. For the market adjusted return model, prior to around 20 days before the announcement, the stock prices move in line with what the theory predicts but start to decrease sharply afterwards. In particular, the CAR from Day -20 to Day -1 is around -5%, or -0.25% a day. On the announcement date, the abnormal return plummets more than 2%, which is statistically significant and making its CAR exceeding -7.5%. Since then, the stock prices gradually resume to the theoretical trend, though they never return to previous levels. In particular, the abnormal return between Day 1 and Day 30 is meagerly 0.4% by equally weighted market index (or -0.16% by value weighted market index), both statistically insignificant. On the other hand, the market return model has similar but slightly weaker results (untabled).

As a result, the first press revealing backdating practice indeed causes non-trivial damages to backdating firms. One thing interesting is the monotonic and substantial decline since 20 days before the news. To explain it, two forces, among others, might come into play. For one thing, based on other information (e.g. abnormal stock trading), investors probably anticipate the news approaching; for the other, which is more likely, insiders anticipate that happening as well. Both factors are potentially involved, and further aggravate

the pattern during that period. At first glance, I suspect the second effect dominates the first one, since insiders should have better information access. But, since the abnormal return pattern almost disappears soon after the news, both effects are already priced in, and the investor effect is not necessarily dominated by the insider effect.

Backdating and Other Corporate Frauds

The last part of the empirical analyses aims to understand whether firms under investigations might in fact act not in bad faith. Following Shane et al. (2005), I collect corporate fraud information from the Accounting and Auditing Enforcement Releases (AAERs) published by the SEC. AAERs provide cases in which the SEC believes to have sufficient evidence of accounting or auditing frauds to bring a case against a firm or its executives. Namely, AAERs represent blatant violations of the Generally Accepted Accounting Principles (GAAP) standards of reporting and disclosure. Alternatively, I use the Stanford Securities Class Action Clearinghouse and find securities class action filings (SCAFs) in the U.S. between 1996 and 2007. Dyck et al. (2007) argue that the assumption that value-impacting corporate frauds follows by a security class action lawsuit filled under the 1933 Exchange Act or the 1934 Securities Act is justifiable. Hence, those filings are valid proxies for alleged corporate frauds. However, one possible problem is that using SCAFs might overestimate the actual corporate frauds; that is, some allegations are frivolous. The enactment of the Private Securities Litigation Reform Act of 1995 aims to reduce frivolous lawsuits. Since the data start from 1996, this overestimation problem is much alleviated.

Table 14 shows that the number of AAERs of each sub-sample firm ranges from 0 to as high as 10, with an average of 0.19 case per firm, and the number of SCAFs ranges from 0 to 3, with an average of 0.63 case per firm. Since AAERs capture outrageous cases of corporate wrongdoing, it can be viewed as the lower bound of the true corporate fraud level. Similarly, since SCAFs include frivolous cases, it is best viewed as the upper bound. Hence, the "confidence interval" of the true corporate frauds committed by firms should be between these two estimates. Note that I exclude backdating related cases for both AAERs

and SCAFs.

To compare, I use SCAFs in order to avoid underestimation (untabled). For the peer group as a whole, the number ranges between 0 and 1, and the mean is 0.27 (the median is 0.25) case per group. The mean test shows that backdating firms seem to commit significantly more other corporate frauds. Nevertheless, the median test indicates otherwise. So, the sub-sample firms on average face more class action lawsuits than their counterparts, but not so if the influences of outliers are eliminated. Even so, I do not find conclusive evidence to reject the hypothesis that backdating firms commit more other frauds. Note that it's possible that backdating investigations might be initiated by the "track record" of corporate frauds. In other words, not only simply being large, but also having more other fraud suits would make firms easy targets.

As mentioned earlier, one way for investors to express their views on firms is through the stock market. And therefore, to some extent, stock price variation can be regarded as "public outcry". Intriguingly, I want to see if there is relationship between CAR and corporate frauds. To achieve that, firstly I use the results from the Event Study in the previous session which include individual CAR during the whole event window. Table 14 reports the outcome in three different sub-periods, i.e. CAR(-1,0), CAR(-30,0) and CAR(-30,30). Panel B shows that the correlation between the number of AAERs and any CAR measure is negative, suggesting that the higher the number of AAERs is, the higher the negative cumulative abnormal return is. Since the level of negative cumulative abnormal return represents the severeness of public outcry for firms, it can be viewed as the reputation risk facing firms. As a result, the negative correlation between the two suggests that the higher the severity of public outcry, the more likely that the shareholders, or the blockholders, might file for law suits as long as they find evidence of wrongdoings of their firms.

Taking a step further, I conduct a regression analysis to know what, if any, might explain this public outcry. Because the abnormal stock return almost disappears after the event, Table 15 shows the estimation results for two dependent variables, CAR(-1,0)

and CAR(-30,0). For CAR(-1,0), in general, market-to-book ratio, ROA, and GIM index are positively associated, with different significant levels, with this CAR measure, which is negatively correlated to AAERs. So, having promising growth prospects, better profitability, and/or poor governance reduce the reputation risk, and committing other corporate frauds aggravates it. When the interaction term of GIM index*AAERs is added, the reputation risk is further reduced for firms with poor governance who also commit other corporate frauds at the same time. More, after controlling for industry effects, all the explanatory variables remain the same signs, but ROA and GIM index are not significant anymore.

When considering the whole pre-event period, a similar picture emerges. Nevertheless, now only growth opportunities and other corporate frauds matter for the reputation risk. The significance of profitability and governance disappear. More than that, another major difference is that, the magnitude for every important factor greatly increases. For both cases, replacing AAERs with SCAFs results in similar outcomes, though weaker again (untabled).

3.7 Concluding Remarks

The finding of positive abnormal stock return pattern after top executive option grants is first thought to be attributed to opportunistic timing of the grants or news. More recent studies increase the event window and discover the negative abnormal return before the grants. Heron and Lie (2007) argue that the majority of this V-shape pattern around the grants is strong evidence for option backdating practice. Since a 1998 regulatory change that required firms to expense the estimated value of repriced grants, top executive stock option repricing has been rare (e.g. Brenner et al., 2000; Chance et al., 2000; Callaghan et al., 2004, Chidambaran and Prabhala, 2003). Besides, several studies find a link between weak corporate governance and option backdating.

In this chapter, focusing on option repricing and corporate governance, I examine what firm-specific attributes might lead to the decision of CEO option backdating or otherwise grant date manipulation. More specifically, I test the alternative hypothesis that, option backdating is one way to reward outperforming executives for firms facing financial con-

straint and stock volatility. By using a sample of 6,836 top executive stock option grants in the S&P 1500 companies between 1999 and 2007, I find that option manipulation does not result from weak corporate governance, inconsistent with the managerial power view. In particular, firms that have a higher propensity to manipulate the grants do not have more anti-takeover provisions and higher management entrenchment levels.

When viewing this manipulating behavior as a treatment, I find that it provides a similar mechanism as option repricing, i.e. to re-incentivize managers with out-of-money options, after the passage of the 2002 SOX. Before that, it is not clear what the mechanisms are engaged in the selection process. The subset of 126 firms that are under option backdating related probes seem to conduct this practice solely to take advantage of stock price volatility, despite no evidence of poor corporate governance.

My analysis also suggests that the 2002 SOX changes how the decision of option manipulation is made. Given the evidence between the two sub-periods, this Act seems to elicit a beneficial influence on the corporate world. For future study, I will further classify options as scheduled or unscheduled. I expect that the results should be mainly driven by the unscheduled ones. Other than that, I will redo the analysis with longer event windows so that it might be able to further distinguish between different types of manipulating behavior.

3.8 Table and Figure

Table 1
Sample Statistics

This table provides summary statistics of sample firms/grants. Panel A displays the firm size distribution, in which the size is proxied by (mean) market value of sample firms between 1999 and 2007. Panel B and D display, firm-wise and grant-wise respectively, their industrial orientations in which the industrial classification is based on SIC codes as well as the classification by Chidambaran und Prabhala (2003). Panel D reports the year distribution of sample grants. Panel E shows other relevant descriptive statistics regarding the sample grants.

Panel A: Size (firm-wise)		
Market Value (US$ million)	Number of Firms	Fraction (%)
<500	189	14.50
500 – 1,000	222	17.04
1,000 – 2,000	267	20.49
2,000 – 3,000	116	8.90
3,000 – 4,000	91	6.98
4,000 – 5,000	52	3.99
5,000 – 6,000	51	3.91
6,000 - 7,000	28	2.15
7,000 – 8,000	25	1.92
8,000 – 9,000	28	2.15
9,000 – 10,000	19	1.46
10,000 – 20,000	119	9.13
20,000 – 30,000	27	2.07
30,000 – 40,000	13	1.00
> 40,000	56	4.30
Sample Size	1,303	100.00
Mean	8,100.82	
Median	1,876.49	
Maximum	460,758.90	
Minimum	15.61	
Standard Deviation	23,677.83	

Panel B: Industry (firm-wise)		
Industry	Number of Firms	Fraction (%)
Agriculture & Food	32	2.47
Mining	9	0.69
Construction	17	1.31
Oil & Petroleum	52	4.01
Small Scale Manufacturing	57	4.39
Chemicals/related manufacturing	148	11.40
Industrial Manufacturing	127	9.78
Computers & Electronic Parts	147	11.33
Printing & Publishing	21	1.62
Transportation	33	2.54
Telecommunication	23	1.77
Utilities	73	5.62
Wholesale	39	3.00
Retail	78	6.01
Services	119	9.17
Financials	175	13.48
Software & Technology	96	7.40
Biotech	52	4.01
Sample Size	1,298	100.00

Panel C: Industry (grant-wise)					
Industry	Number of Total Grants	Number of Non-Manipulated Options	Fraction (%)	Number of Manipulated Options[1]	Fraction (%)
Agriculture & Food	194	192	2.97	2	0.56
Mining	48	45	0.70	3	0.83
Construction	83	76	1.18	7	1.94
Oil & Petroleum	252	244	3.77	8	2.22
Small Scale Manufacturing	327	314	4.86	13	3.61
Chemicals/related manufacturing	893	860	13.30	33	9.17
Industrial Manufacturing	620	587	9.08	33	9.17
Computers & Electronic Parts	810	718	11.11	92	25.56
Printing & Publishing	147	146	2.26	1	0.28
Transportation	221	208	3.22	13	3.61
Telecommunication	102	96	1.49	6	1.67
Utilities	354	345	5.34	9	2.50
Wholesale	210	196	3.03	14	3.89
Retail	401	384	5.94	17	4.72
Services	571	538	8.32	33	9.17
Financials	885	860	13.30	25	6.94
Software & Technology	422	386	5.97	36	10.00
Biotech	284	269	4.16	15	4.17
Sample Size	6,824	6,464	100.00	360	100.00

Panel D: Year (grant-wise)					
Year	Number of Total Grants	Number of Non-Manipulated Options	Fraction (%)	Number of Manipulated Options	Fraction (%)
1999	501	460	7.11	41	11.36
2000	550	487	7.52	63	17.45
2001	689	604	9.33	85	23.55
2002	729	674	10.41	54	14.96
2003	908	868	13.41	40	11.08
2004	918	891	13.76	27	7.48
2005	949	932	14.40	17	4.71
2006	836	819	12.65	17	4.71
2007	756	739	11.41	17	4.71
Sample Size	6,836	6,474	100.00	361	100.00

[1] For grants whose AR(+1,+20)-AR(-20,-1) are among the top 10% of all sample grants with positive values.

Panel E: Others (grant-wise)								
	Firm Age	Dispensable Cash	M/B Ratio	Return on Assets	Stock Volatility	CEO Option Holding Ratio	GIM Index	Entrenchment Index
				Total Options				
Mean	28.21	456.39	-8.75	0.09	4.92	0.44	9.38	2.54
Standard Deviation	16.71	2,022.56	1,224.16	0.10	5.77	0.28	2.61	1.28
Median	23	62.52	4.81	0.09	3.35	0.41	9	3
Maximum	57	36,999	781.30	0.86	89.97	4.97	18	6
Minimum	2	-35,936	-101,170	-1.58	0.13	-0.28	1	0
Sample Size	6,835	6,833	6,835	6,835	6,835	6,835	6,835	6,157
				Non-Manipulated Options				
Mean	28.61	473.92	-9.59	0.09	4.86	0.43	9.43	2.56
Standard Deviation	16.72	2,074.91	1,257.83	0.10	5.67	0.28	2.60	1.28
Median	24	64.33	4.81	0.09	3.33	0.41	9	3
Maximum	57	36,999	781.30	0.86	89.97	4.97	18	6
Minimum	2	-35,936	-101,170	-1.58	0.13	-0.28	1	0
Sample Size	6,474	6,472	6,474	6,474	6,474	6,474	6,474	5,838
				Manipulated Options				
Mean	20.98	142.22	6.34	0.06	6.07	0.51	8.43	2.23
Standard Deviation	14.77	376.50	11.45	0.13	7.21	0.29	2.62	1.25
Median	14	44.96	4.67	0.07	3.73	0.51	9	2
Maximum	54	3,775	182.84	0.39	57.33	1.09	18	6
Minimum	3	-838	-45.39	-0.97	0.30	0.00	3	0
Sample Size	361	361	361	361	361	361	361	319

Table 2
Mean-Test Analysis of Manipulating CEO Stock Option Grants

This table shows the testing results of univariate mean comparison analysis of CEO stock option grants between 1999 and 2007. Option grants are assumed to be manipulated as long as the values of AR(+1,+20)-AR(-20,-1) are among the top 10% of all sample grants with positive values. Firm size has proxy of log(market value), and firm age is the difference between the first year in which the firm has data in Compustat and the option grant year. Dispensable cash ratio is defined as cash subtracted by interest expenses, scaled by total assets, and growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. Also, return on assets is a ratio of EBIT (earnings before interest and tax) to total assets, stock volatility is the standard deviation of monthly stock prices, and CEO option holding ratio is option value (black-scholes) divided by total compensation. GIM index adopts Gompers et al. (2003), while Entrenchment index follows Bebchuk, Cohen, and Ferrell (2004). The symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively. P-values are reported in the parentheses.

	Non-Manipulated Options (N)	Manipulated Options (M)	Difference (N,M)
Firm Size (t-1)	3.482	3.149	-0.334***
			(0)
Firm Age (t)	28.610	20.983	-7.626***
			(0)
Dispensable Cash Ratio (t-1)	0.071	0.096	0.025***
			(0)
M/B Ratio (t-1)	-9.588	6.336	15.924
			(0.8099)
Return on Assets (t-1)	0.091	0.062	-0.029***
			(0)
Stock Volatility (t)	4.860	6.068	1.209***
			(0.0001)
CEO Option Holding Ratio (t)	0.435	0.510	0.075***
			(0)
GIM Index (t-1)	9.430	8.429	-1.001***
			(0)
Entrenchment Index (t-1)	2.559	2.226	-0.333***
			(0)
Firm-Date Observation	6,474	361	

Table 3
Correlation Matrix

This table reports the correlations between explanatory variables. Firm size has proxy of log(market value), and firm age is the difference between the first year in which the firm has data in Compustat and the option grant year. Dispensable cash ratio is defined as cash subtracted by interest expenses, scaled by total assets, and growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. Also, return on assets is a ratio of EBIT (earnings before interest and tax) to total assets, stock volatility is the standard deviation of monthly stock prices, and CEO option holding ratio is option value (black-scholes) divided by total compensation. GIM index adopts Gompers et al. (2003), while Entrenchment index follows Bebchuk, Cohen, and Ferrell (2004).

	Firm Size	Firm Age	Dispensable Cash	M/B Ratio	Return on Assets	Stock Volatility	CEO Option Ratio	GIM Index	Entrenchment Index
Firm Size (t-1)	1								
Firm Age (t)	0.3206	1							
Dispensable Cash Ratio (t-1)	-0.1478	-0.2506	1						
M/B Ratio (t-1)	-0.0075	0.0169	-0.0218	1					
Return on Assets (t-1)	0.2645	0.0628	-0.0414	-0.0786	1				
Stock Volatility (t)	0.2436	0.0286	-0.0258	-0.0044	0.1413	1			
CEO Option Ratio (t)	0.1622	-0.1708	0.1513	0.0042	0.02	0.1176	1		
GIM Index (t-1)	0.0561	0.3307	-0.1618	-0.0027	0.0335	0.0023	-0.0939	1	
Entrenchment Index (t-1)	-0.1358	0.1178	-0.1084	-0.0051	0.0106	-0.0522	-0.1229	0.7191	1

Table 4
Determinants of Manipulating CEO Stock Option Grants

This table provides linear probability estimates of predictors for manipulating CEO stock option grants. The dependent variable is assigned to 1 for grants whose AR(+1,+20)-AR(-20,-1) are among the top 10% of all sample grants with positive values, and 0 otherwise. For the explanatory variables, firm size has proxy of log(market value) and firm age is the difference between the first year in which the firm has data in Compustat and the option grant year. Dispensable cash ratio is defined as cash subtracted by interest expenses, scaled by total assets, and growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. Also, return on assets is a ratio of EBIT (earnings before interest and tax) to total assets, stock volatility is the standard deviation of monthly stock prices, and CEO option holding ratio is option value (black-scholes) divided by total compensation. GIM index adopts Gompers et al. (2003), while Entrenchment index follows Bebchuk, Cohen, and Ferrell (2004). Panel A summaries the estimation results in the entire sample period, from 1996 to 2007, while Panel B uses two periods, which is separated by the month of August 2002. Industry fixed effects adopt four-digit SIC codes. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Whole Sample Estimation Results				
	(1)	(2)	(3)	(4)
Size (t-1)	-0.034[c]	-0.037[c]	-0.026[c]	-0.028[c]
	(0.004)	(0.005)	(0.006)	(0.006)
Age (t)	-0.000[c]	-0.001[c]	-0.000[a]	-0.001[b]
	(0)	(0)	(0)	(0)
Dispensable Cash Ratio (t-1)	0.020	0.020	0.012	-0.001
	(0.026)	(0.027)	(0.034)	(0.035)
Market to Book Ratio (t-1)	-0.000	-0.000	-0.000	-0.000
	(0)	(0)	(0)	(0)
Return on Assets (t-1)	-0.107[c]	-0.124[c]	-0.077[b]	-0.097[c]
	(0.028)	(0.029)	(0.035)	(0.036)
Stock Volatility (t)	0.003[c]	0.003[c]	0.001[b]	0.001[b]
	(0)	(0)	(0.001)	(0.001)
CEO Option Holding Ratio (t)	0.045[c]	0.043[c]	-0.008	-0.006
	(0.01)	(0.011)	(0.012)	(0.012)
GIM Index (t-1)	-0.005[c]		-0.005[c]	
	(0.001)		(0.001)	
Entrenchment Index (t-1)		-0.010[c]		-0.006[b]
		(0.002)		(0.003)
Industry FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes
R^2	0.0307	0.0321	0.1089	0.1168
Adjusted R^2	0.0296	0.0308	0.0651	0.0706
Sample Size	6,835	6,157	6,835	6,157

Panel B: Sub-Sample Estimation Results								
	Pre-SOX (01/1996-08/2002)				Post-SOX (09/2002-11/2007)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Size (t-1)	-0.037[c]	-0.043[c]	-0.017	-0.019	-0.025[c]	-0.027[c]	-0.028[c]	-0.030[c]
	(0.01)	(0.01)	(0.014)	(0.015)	(0.004)	(0.005)	(0.005)	(0.006)
Age (t)	-0.002[c]	-0.002[c]	-0.002[c]	-0.002[c]	-0.000	-0.000	0.000	0.000
	(0)	(0)	(0.001)	(0.001)	(0)	(0)	(0)	(0)
Dispensable Cash Ratio (t-1)	0.178[b]	0.181[b]	0.018	-0.008	0.084[c]	0.082[c]	0.041	0.023
	(0.077)	(0.08)	(0.105)	(0.109)	(0.023)	(0.024)	(0.029)	(0.031)
Market to Book Ratio (t-1)	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Return on Assets (t-1)	-0.078	-0.105	-0.060	-0.125	-0.151[c]	-0.162[c]	-0.117[c]	-0.119[c]
	(0.072)	(0.074)	(0.1)	(0.105)	(0.025)	(0.026)	(0.031)	(0.033)
Stock Volatility (t)	0.003[c]	0.003[c]	0.001	0.001	0.001	0.001	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO Option Holding Ratio (t)	0.030	0.031	-0.050	-0.041	0.013	0.011	0.003	0.004
	(0.026)	(0.027)	(0.031)	(0.032)	(0.009)	(0.01)	(0.01)	(0.011)
GIM Index (t-1)	-0.008[c]		-0.005		-0.003[c]		-0.003[b]	
	(0.002)		(0.003)		(0.001)		(0.001)	
Entrenchment Index (t-1)		-0.009[a]		0.000		-0.008[c]		-0.007[c]
		(0.005)		(0.006)		(0.002)		(0.003)
Industry FE	No	No	Yes	Yes	No	No	Yes	Yes
Year FE	No	No	Yes	Yes	No	No	Yes	Yes
R^2	0.0388	0.0379	0.1613	0.1776	0.0353	0.0393	0.1117	0.1236
Adjusted R^2	0.0354	0.0341	0.0559	0.0681	0.0336	0.0374	0.0472	0.0561
Sample Size	2,267	2,043	2,267	2,043	4,568	4,114	4,568	4,114

Table 5
Manipulating CEO Stock Option Grants and Performance

This table shows the two-stage treatment effect estimation results on how manipulating CEO stock option grants might influence performance, which is winsorized at the 1% level. The dependent variable is return on assets, a ratio of EBIT (earnings before interest and tax) to total assets. For the explanatory variables, option manipulation variable is a dummy variable, assigned to 1 for grants whose AR(+1,+20)-AR(-20,-1) are among the top 10% of all sample grants with positive values, and 0 otherwise. Firm size has proxy of log(market value), and firm age is the difference between the first year in which the firm has data in Compustat and the option grant year. Dispensable cash ratio is defined as cash subtracted by interest expenses, scaled by total assets, and growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. Moreover, stock volatility is the standard deviation of monthly stock prices, and CEO option holding ratio is option value (black-scholes) divided by total compensation. GIM index adopts Gompers et al. (2003), while Entrenchment index follows Bebchuk, Cohen, and Ferrell (2004). Panel A summaries the estimation results in the entire sample period, from 1996 to 2007, while Panel B uses two periods, which is separated by the month of August 2002. Industry fixed effects adopt four-digit SIC codes. Standard deviations are reported in the parentheses and the symbols a, b, and c represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Whole Sample Estimation Results				
	(1)	(2)	(3)	(4)
Controls:				
Size (t-1)	0.007[c]	0.008[c]	0.015[c]	0.016[c]
	(0.001)	(0.001)	(0.001)	(0.001)
Return on Assets (t-1)	0.677[c]	0.674[c]	0.580[c]	0.571[c]
	(0.007)	(0.007)	(0.008)	(0.008)
Option Manipulation	0.025	0.034[b]	0.045[c]	0.056[c]
	(0.016)	(0.017)	(0.016)	(0.017)
Selection Variables:				
Size (t-1)	-0.356[c]	-0.384[c]	-0.356[c]	-0.384[c]
	(0.046)	(0.049)	(0.046)	(0.049)
Age (t)	-0.006[c]	-0.007[c]	-0.006[c]	-0.007[c]
	(0.002)	(0.002)	(0.002)	(0.002)
Dispensable Cash Ratio (t-1)	0.027	0.016	0.027	0.016
	(0.232)	(0.245)	(0.232)	(0.245)
Return on Assets (t-1)	-0.636[c]	-0.727[c]	-0.636[c]	-0.727[c]
	(0.239)	(0.251)	(0.239)	(0.251)
Stock Volatility (t)	0.023[c]	0.023[c]	0.023[c]	0.023[c]
	(0.004)	(0.004)	(0.004)	(0.004)
CEO Option Holding Ratio (t)	0.407[c]	0.388[c]	0.407[c]	0.388[c]
	(0.092)	(0.097)	(0.092)	(0.097)
GIM Index (t-1)	-0.044[c]		-0.044[c]	
	(0.011)		(0.011)	
Entrenchment Index (t-1)		-0.084[c]		-0.084[c]
		(0.023)		(0.023)
Hazard:				
Lambda	-0.017[b]	-0.021[c]	-0.024[c]	-0.029[c]
	(0.007)	(0.008)	(0.008)	(0.008)
Industry FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes
Wald Chi^2	11743.36	10464.22	14512.31	13119.77
Probability > Chi^2	0	0	0	0
Sample Size	6,823	6,146	6,823	6,146

Panel B: Sub-Sample Estimation Results								
	Pre-SOX (01/1996-08/2002)				Post-SOX (09/2002-11/2007)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Controls:								
Size (t-1)	-0.001	-0.002	0.006[c]	0.008[c]	0.014[c]	0.016[c]	0.022[c]	0.023[c]
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Return on Assets (t-1)	0.685[c]	0.675[c]	0.545[c]	0.520[c]	0.694[c]	0.695[c]	0.600[c]	0.598[c]
	(0.013)	(0.015)	(0.016)	(0.017)	(0.009)	(0.01)	(0.01)	(0.011)
Option Manipulation	-0.043[b]	-0.080[c]	-0.020	-0.033	0.168[c]	0.185[c]	0.129[c]	0.151[c]
	(0.02)	(0.023)	(0.023)	(0.026)	(0.021)	(0.022)	(0.019)	(0.02)
Selection Variables:								
Size (t-1)	-0.229[c]	-0.275[c]	-0.229[c]	-0.275[c]	-0.471[c]	-0.479[c]	-0.471[c]	-0.479[c]
	(0.06)	(0.065)	(0.06)	(0.065)	(0.079)	(0.082)	(0.079)	(0.082)
Age (t)	-0.010[c]	-0.011[c]	-0.010[c]	-0.011[c]	-0.005[a]	-0.005	-0.005[a]	-0.005
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Dispensable Cash Ratio	0.768[a]	0.801[a]	0.768[a]	0.801[a]	0.674[b]	0.656[b]	0.674[b]	0.656[b]
(t-1)	(0.407)	(0.434)	(0.407)	(0.434)	(0.305)	(0.319)	(0.305)	(0.319)
Return on Assets (t-1)	-0.395	-0.517	-0.395	-0.517	-1.122[c]	-1.168[c]	-1.122[c]	-1.168[c]
	(0.402)	(0.429)	(0.402)	(0.429)	(0.316)	(0.328)	(0.316)	(0.328)
Stock Volatility (t)	0.014[c]	0.015[c]	0.014[c]	0.015[c]	0.015	0.016	0.015	0.016
	(0.004)	(0.004)	(0.004)	(0.004)	(0.01)	(0.01)	(0.01)	(0.01)
CEO Option Holding	0.164	0.178	0.164	0.178	0.163	0.124	0.163	0.124
Ratio (t)	(0.154)	(0.165)	(0.154)	(0.165)	(0.144)	(0.155)	(0.144)	(0.155)
GIM Index (t-1)	-0.043[c]		-0.043[c]		-0.038[b]		-0.038[b]	
	(0.015)		(0.015)		(0.017)		(0.017)	
Entrenchment Index (t-1)		-0.047		-0.047		-0.104[c]		-0.104[c]
		(0.031)		(0.031)		(0.036)		(0.036)
Hazard:								
Lambda	0.020[a]	0.039[c]	0.008	0.015	-0.081[c]	-0.089[c]	-0.062[c]	-0.071[c]
	(0.01)	(0.012)	(0.012)	(0.014)	(0.009)	(0.01)	(0.009)	(0.009)
Industry FE	No	No	Yes	Yes	No	No	Yes	Yes
Year FE	No	No	Yes	Yes	No	No	Yes	Yes
Wald Chi^2	2764.51	2282.09	4741.38	4467.99	7162.42	6156.80	10112.01	8618.42
Probability > Chi^2	0	0	0	0	0	0	0	0
Sample Size	2,266	2,043	2,266	2,043	4,557	4,103	4,557	4,103

Table 6
Summary of Manipulating CEO Stock Option Grants and Performance

This table summaries the estimation results in Table 5. It shows the relationships between the practice of CEO stock option grant date manipulation and its predictors, as well as how the manipulation might influence performance while controlling for firm size, the previous performance, industry fixed effects, and year fixed effects.

		Return on Assets (t)		
		Whole Period	Sub-Period: Pre-SOX	Sub-Period: Post-SOX
Size (t-1)		+	+	+
Return on Assets (t-1)		+	+	+
Option Manipulation		+		+
	Selection Variables:			
	Size (t-1)	−	−	−
	Age (t)	−	−	
	Dispensable Cash Ratio (t-1)		+	+
	Return on Assets (t-1)	−		−
	Stock Volatility (t)	+	+	
	CEO Option Holding Ratio (t)	+		
	GIM Index (t-1)	−	−	−
	Entrenchment Index (t-1)	−		−

Table 7
Robustness: Determinants of Manipulating CEO Stock Option Grants

This table provides linear probability estimates of predictors for manipulating CEO stock option grants. The dependent variable is assigned to 1 for grants whose AR(+1,+20)-AR(-20,-1) are positive, and 0 otherwise. For the explanatory variables, firm size has proxy of log(market value) and firm age is the difference between the first year in which the firm has data in Compustat and the option grant year. Dispensable cash ratio is defined as cash subtracted by interest expenses, scaled by total assets, and growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. Also, return on assets is a ratio of EBIT (earnings before interest and tax) to total assets, stock volatility is the standard deviation of monthly stock prices, and CEO option holding ratio is option value (black-scholes) divided by total compensation. GIM index adopts Gompers et al. (2003), while Entrenchment index follows Bebchuk, Cohen, and Ferrell (2004). Panel A summaries the estimation results in the entire sample period, from 1996 to 2007, while Panel B uses two periods, which is separated by the month of August 2002. Industry fixed effects adopt four-digit SIC codes. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Whole Sample Estimation Results				
	(1)	(2)	(3)	(4)
Size (t-1)	-0.028[c]	-0.035[c]	-0.032[b]	-0.037[c]
	(0.01)	(0.011)	(0.013)	(0.014)
Age (t)	-0.001[b]	-0.001[b]	-0.001[b]	-0.002[c]
	(0)	(0)	(0.001)	(0.001)
Dispensable Cash Ratio (t-1)	-0.120[b]	-0.127[b]	-0.095	-0.140[a]
	(0.059)	(0.062)	(0.077)	(0.081)
Market to Book Ratio (t-1)	-0.000	-0.000	-0.000	-0.000
	(0)	(0)	(0)	(0)
Return on Assets (t-1)	0.175[c]	0.175[c]	0.238[c]	0.215[b]
	(0.064)	(0.067)	(0.08)	(0.084)
Stock Volatility (t)	-0.000	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
CEO Option Holding Ratio (t)	0.006	-0.008	-0.035	-0.037
	(0.023)	(0.024)	(0.026)	(0.028)
GIM Index (t-1)	-0.003		-0.004	
	(0.002)		(0.003)	
Entrenchment Index (t-1)		-0.005		-0.004
		(0.005)		(0.006)
Industry FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes
R^2	0.0041	0.0048	0.0649	0.07
Adjusted R^2	0.003	0.0035	0.019	0.0214
Sample Size	6,835	6,157	6,835	6,157

Panel B: Sub-Sample Estimation Results								
	Pre-SOX (01/1996-08/2002)				Post-SOX (09/2002-11/2007)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Size (t-1)	-0.034[b]	-0.045[b]	-0.046[a]	-0.056[b]	-0.020	-0.024[a]	-0.027[a]	-0.026
	(0.016)	(0.017)	(0.024)	(0.025)	(0.013)	(0.014)	(0.016)	(0.017)
Age (t)	-0.001	-0.001[a]	-0.002	-0.002[a]	-0.001	-0.001	-0.001[a]	-0.001[a]
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dispensable Cash Ratio (t-1)	-0.161	-0.206	-0.148	-0.249	-0.067	-0.066	-0.114	-0.152
	(0.129)	(0.137)	(0.175)	(0.187)	(0.069)	(0.072)	(0.089)	(0.094)
Market to Book Ratio (t-1)	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0)	(0)	(0.001)	(0.001)	(0)	(0)	(0)	(0)
Return on Assets (t-1)	0.372[c]	0.387[c]	0.355[b]	0.379[b]	0.082	0.076	0.156	0.133
	(0.12)	(0.126)	(0.167)	(0.18)	(0.076)	(0.08)	(0.095)	(0.1)
Stock Volatility (t)	-0.001	-0.001	0.002	0.002	-0.001	-0.001	-0.003	-0.003
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CEO Option Holding Ratio (t)	-0.015	-0.028	-0.064	-0.080	-0.002	-0.014	-0.033	-0.031
	(0.044)	(0.046)	(0.052)	(0.056)	(0.028)	(0.03)	(0.032)	(0.034)
GIM Index (t-1)	-0.005		-0.001		-0.002		-0.003	
	(0.004)		(0.005)		(0.003)		(0.004)	
Entrenchment Index (t-1)		-0.006		0.007		-0.004		-0.002
		(0.009)		(0.011)		(0.006)		(0.008)
Industry FE	No	No	Yes	Yes	No	No	Yes	Yes
Year FE	No	No	Yes	Yes	No	No	Yes	Yes
R^2	0.0096	0.0123	0.1358	0.1421	0.0023	0.0025	0.0855	0.0916
Adjusted R^2	0.0061	0.0085	0.0272	0.0279	0.0006	0.0005	0.0191	0.0217
Sample Size	2,267	2,043	2,267	2,043	4,568	4,114	4,568	4,114

Table 8
Robustness: Manipulating CEO Stock Option Grants and Performance

This table shows the two-stage treatment effect estimation results on how manipulating CEO stock option grants might influence performance, which is winsorized at the 1% level. The dependent variable is return on assets, a ratio of EBIT (earnings before interest and tax) to total assets. For the explanatory variables, option manipulation variable is a dummy variable, assigned to 1 for grants whose AR(+1,+20)-AR(-20,-1) are positive, and 0 otherwise. Firm size has proxy of log(market value), and firm age is the difference between the first year in which the firm has data in Compustat and the option grant year. Dispensable cash ratio is defined as cash subtracted by interest expenses, scaled by total assets, and growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. Moreover, stock volatility is the standard deviation of monthly stock prices, and CEO option holding ratio is option value (black-scholes) divided by total compensation. GIM index adopts Gompers et al. (2003), while Entrenchment index follows Bebchuk, Cohen, and Ferrell (2004). Panel A summaries the estimation results in the entire sample period, from 1996 to 2007, while Panel B uses two periods, which is separated by the month of August 2002. Industry fixed effects adopt four-digit SIC codes. Standard deviations are reported in the parentheses and the symbols a, b, and c represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Whole Sample Estimation Results				
	(1)	(2)	(3)	(4)
Controls:				
Size (t-1)	0.003	0.003	0.016[c]	0.017[c]
	(0.002)	(0.002)	(0.002)	(0.002)
Return on Assets (t-1)	0.691[c]	0.684[c]	0.566[c]	0.552[c]
	(0.012)	(0.012)	(0.011)	(0.012)
Option Manipulation	-0.094[b]	-0.082[a]	0.051	0.067
	(0.043)	(0.044)	(0.04)	(0.046)
Selection Variables:				
Size (t-1)	-0.072[c]	-0.090[c]	-0.072[c]	-0.090[c]
	(0.025)	(0.027)	(0.025)	(0.027)
Age (t)	-0.002[b]	-0.002[b]	-0.002[b]	-0.002[b]
	(0.001)	(0.001)	(0.001)	(0.001)
Dispensable Cash Ratio (t-1)	-0.298[b]	-0.319[b]	-0.298[b]	-0.319[b]
	(0.149)	(0.155)	(0.149)	(0.155)
Return on Assets (t-1)	0.451[c]	0.457[c]	0.451[c]	0.457[c]
	(0.16)	(0.168)	(0.16)	(0.168)
Stock Volatility (t)	-0.001	-0.002	-0.001	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)
CEO Option Holding Ratio (t)	0.018	-0.015	0.018	-0.015
	(0.058)	(0.061)	(0.058)	(0.061)
GIM Index (t-1)	-0.008		-0.008	
	(0.006)		(0.006)	
Entrenchment Index (t-1)		-0.014		-0.014
		(0.013)		(0.013)
Hazard:				
Lambda	0.059[b]	0.052[a]	-0.032	-0.041
	(0.027)	(0.028)	(0.025)	(0.029)
Industry FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes
Wald Chi^2	6533.70	6582.94	12033.66	9743.93
Probability > Chi^2	0	0	0	0
Sample Size	6,823	6,146	6,823	6,146

Panel B: Sub-Sample Estimation Results								
	Pre-SOX (01/1996-08/2002)				Post-SOX (09/2002-11/2007)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Controls:								
Size (t-1)	0.004	0.007[a]	0.015[c]	0.020[c]	0.006[b]	0.006[a]	0.019[c]	0.020[c]
	(0.003)	(0.004)	(0.006)	(0.006)	(0.003)	(0.004)	(0.002)	(0.003)
Return on Assets (t-1)	0.657[c]	0.641[c]	0.477[c]	0.447[c]	0.681[c]	0.677[c]	0.578[c]	0.567[c]
	(0.026)	(0.03)	(0.046)	(0.048)	(0.014)	(0.016)	(0.01)	(0.012)
Option Manipulation	0.083	0.107[a]	0.180[a]	0.186[b]	-0.126[a]	-0.143	-0.000	0.045
	(0.056)	(0.06)	(0.096)	(0.095)	(0.075)	(0.097)	(0.056)	(0.071)
Selection Variables:								
Size (t-1)	-0.085[b]	-0.113[b]	-0.085[b]	-0.113[b]	-0.052	-0.063[a]	-0.052	-0.063[a]
	(0.041)	(0.044)	(0.041)	(0.044)	(0.032)	(0.034)	(0.032)	(0.034)
Age (t)	-0.003	-0.003[a]	-0.003	-0.003[a]	-0.002	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Dispensable Cash Ratio	-0.377	-0.515	-0.377	-0.515	-0.166	-0.165	-0.166	-0.165
(t-1)	(0.328)	(0.346)	(0.328)	(0.346)	(0.173)	(0.181)	(0.173)	(0.181)
Return on Assets (t-1)	0.939[c]	0.990[c]	0.939[c]	0.990[c]	0.228	0.216	0.228	0.216
	(0.309)	(0.324)	(0.309)	(0.324)	(0.191)	(0.2)	(0.191)	(0.2)
Stock Volatility (t)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
CEO Option Holding	-0.045	-0.071	-0.045	-0.071	-0.001	-0.029	-0.001	-0.029
Ratio (t)	(0.111)	(0.118)	(0.111)	(0.118)	(0.071)	(0.074)	(0.071)	(0.074)
GIM Index (t-1)	-0.011		-0.011		-0.005		-0.005	
	(0.01)		(0.01)		(0.008)		(0.008)	
Entrenchment Index (t-1)		-0.016		-0.016		-0.010		-0.010
		(0.022)		(0.022)		(0.016)		(0.016)
Hazard:								
Lambda	-0.052	-0.066[a]	-0.113[a]	-0.116[a]	0.079[a]	0.089	-0.000	-0.029
	(0.035)	(0.037)	(0.06)	(0.059)	(0.047)	(0.061)	(0.035)	(0.044)
Industry FE	No	No	Yes	Yes	No	No	Yes	Yes
Year FE	No	No	Yes	Yes	No	No	Yes	Yes
Wald Chi^2	1821.26	1348.27	1302.68	1170.48	3626.02	2805.19	12251.79	8952.07
Probability > Chi^2	0	0	0	0	0	0	0	0
Sample Size	2,266	2,043	2,266	2,043	4,557	4,103	4,557	4,103

Table 9
Sub-Sample: Summary Statistics

This table provides summary statistics of 126 sub-sample firms under investigations related to backdating CEO stock options in the U.S. Panel A displays, in 2001 and 2006, the size distribution of sample firms, in which the market value data are retrieved from Datastream. Panel B displays their industrial orientations in which the industrial classification is based on the four-digit SIC codes as well as the classification by Chidambaran und Prabhala (2003).

Panel A: Size				
Market Value (US$ million)	2001		2006	
	Number of Firms	Fraction in %	Number of Firms	Fraction in %
< 1,000	50	40.00	44	34.92
1,000 – 2,000	21	16.80	26	20.63
2,000 – 3,000	8	6.40	7	5.56
3,000 – 4,000	9	7.20	10	7.94
4,000 – 5,000	5	4.00	4	3.17
5,000 – 6,000	5	4.00	5	3.97
6,000 - 7,000	3	2.40	3	2.38
7,000 – 8,000	4	3.20	4	3.17
8,000 – 9,000	3	2.40	3	2.38
9,000 – 10,000	3	2.40	5	3.97
> 10,000	14	11.20	15	11.90
Sample Size	125	100.00	126	100.00

Panel B: Industry		
Industry	Number of Firms	Fraction in %
Agriculture & Food	2	1.59
Mining	0	0.00
Construction	1	0.79
Oil & Petroleum	2	1.59
Small Scale Manufacturing	0	0.00
Chemicals/related manufacturing	4	3.17
Industrial Manufacturing	8	6.35
Computers & Electronic Parts	40	31.75
Printing & Publishing	0	0.00
Transportation	1	0.79
Telecommunication	7	5.56
Utilities	0	0.00
Wholesale	3	2.38
Retail	8	6.35
Services	10	7.94
Financials	4	3.17
Software & Technology	30	23.81
Biotech	6	4.76
Sample Size	126	100.00

Table 10
Sub-Sample: Backdating and Corporate Governance

This table shows whether the sub-sample backdating firms have the same corporate governance level with the market average and their peers in 1998 and 2006, respectively. Panel A displays the mean test results, using t-test for equality, between the sample and the market average, while Panel B tests for the equality between the sub-sample and its peer group. The symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively. P-values are reported in the parentheses.

Panel A: Mean Test between Sub-Sample and Market Average

		1998			2006		
		Sub-Sample (S)	Market (M)	Difference (M,S)	Sub-Sample (S)	Market (M)	Difference (M,S)
GIM Index		7.11	8.78	-1.67*** (0.0003)	8.14	9.02	-0.88*** (0.0009)
GIM Sub-Index	Delay	1.76	2.11	-0.35* (0.076)	2.49	2.46	0.04 (0.7738)
	Protection	1.89	2.09	-0.20 (0.3585)	1.83	2.04	-0.21* (0.0722)
	Voting	0.53	0.68	-0.16 (0.2352)	0.52	0.71	-0.19** (0.0217)
	Others	0.39	0.94	-0.54*** (0.0003)	0.59	0.84	-0.25*** (0.0041)
	State	1.18	1.68	-0.50 ** (0.0144)	1.29	1.72	-0.43*** (0.0017)
BCF Entrenchment Index		1.16	2.00	-0.84*** (0.0001)	1.92	2.25	-0.33** (0.0124)
Sample Size		38	1,913		93	1,896	

Panel B: Mean Test between Sub-Sample and Peer Group

		1998			2006		
		Sub-Sample (S)	Peers (P)	Difference (P,S)	Sub-Sample (S)	Peers (P)	Difference (P,S)
GIM Index		7.00	7.97	-0.97** (0.0281)	8.13	8.74	-0.61** (0.0427)
GIM Sub-Index	Delay	1.76	2.03	-0.27 (0.1728)	2.49	2.40	0.09 (0.5665)
	Protection	1.84	1.80	0.04 (0.8757)	1.84	2.07	-0.23 (0.1697)
	Voting	0.51	0.51	0.00 (1)	0.51	0.62	-0.11 (0.2718)
	Others	0.38	0.84	-0.46*** (0.002)	0.59	0.75	-0.16* (0.0584)
	State	1.14	1.36	-0.23 (0.2815)	1.29	1.60	-0.30** (0.0207)
BCF Entrenchment Index		1.16	1.74	-0.58*** (0.0056)	1.90	2.18	-0.28* (0.0811)
Sample Size		37	37		92	92	

Table 11
Sub-Sample: Backdating and Performance, Stock Volatility, and Financial Constraint

This table shows the comparison of performance, stock volatility, and cash holdings between the sub-sample backdating firms and their corresponding peer group (Panel A), as well as the market (Panel B). There are three proxies for market, S&P Composite Index (S&P), and value weighted and equally weighted NYSE/AMEX/NASDAQ Index (VWNA and EWNA, respectively). In Panel A, performance is measured by return on assets, a ratio of EBIT (earnings before interest and tax) to total assets. Cash holdings is measured by total cash subtracted by interest and related expenses. In Panel B, performance is measured by average return of stock price (index). In Panel A and B, stock volatility is measured by standard deviation of stock price (index), scaled by its mean. The symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively. P-values are reported in the parentheses.

Panel A: Mean Test between Sub-Sample and Peer Group

	Performance			Stock Volatility			Cash Holdings		
	Sub-Sample (S)	Peers (P)	Difference (P,S)	Sub-Sample (S)	Peers (P)	Difference (P,S)	Sub-Sample (S)	Peers (P)	Difference (P,S)
1998	-0.063	0.006	-0.069*	0.272	0.279	-0.007	0.184	0.150	0.034*
			(0.0854)			(0.8054)			(0.0578)
1999	0.018	-0.021	0.039	0.306	0.300	0.007	0.179	0.162	0.018
			(0.1863)			(0.8143)			(0.3996)
2000	0.043	0.058	-0.015	0.360	0.363	-0.003	0.181	0.158	0.023
			(0.4133)			(0.9165)			(0.2156)
2001	-0.042	-0.034	-0.009	0.330	0.328	0.002	0.180	0.165	0.016
			(0.7385)			(0.946)			(0.3916)
2002	-0.016	0.010	-0.026	0.364	0.346	0.018	0.174	0.154	0.021
			(0.1521)			(0.591)			(0.1675)
2003	0.033	0.044	-0.011	0.277	0.297	-0.020	0.206	0.179	0.027
			(0.3719)			(0.4935)			(0.1104)
2004	0.061	0.059	0.002	0.183	0.187	-0.004	0.155	0.153	0.002
			(0.8707)			(0.7608)			(0.89)
2005	0.071	0.069	0.002	0.142	0.169	-0.028	0.164	0.150	0.014
			(0.8668)			(0.192)			(0.3921)
Sample Size (Maximum)	120	120		106	106		121	121	

Panel B: Mean Test between Sub-Sample and Market Average						
	Performance			Stock Volatility		
	Difference (S&P,S)	Difference (VWNA,S)	Difference (EWNA,S)	Difference (S&P,S)	Difference (VWNA,S)	Difference (EWNA,S)
1998	0.020***	0.024***	0.043***	0.194***	0.195***	0.152***
	(0.0018)	(0.0002)	(0)	(0)	(0)	(0)
1999	0.091***	0.088***	0.083***	0.261***	0.249***	0.233***
	(0)	(0)	(0)	(0)	(0)	(0)
2000	0.023**	0.024***	0.024**	0.307***	0.295***	0.259***
	(0.0145)	(0.0092)	(0.0109)	(0)	(0)	(0)
2001	0.031***	0.030***	0.002	0.240***	0.237***	0.251***
	(0)	(0)	(0.7845)	(0)	(0)	(0)
2002	0.000	-0.001	-0.011**	0.245***	0.250***	0.258***
	(0.9269)	(0.8563)	(0.0118)	(0)	(0)	(0)
2003	0.047***	0.044***	0.021***	0.189***	0.176***	0.083***
	(0)	(0)	(0)	(0)	(0)	(0)
2004	0.010***	0.008**	0.002	0.151***	0.146***	0.127***
	(0.0052)	(0.0168)	(0.6448)	(0)	(0)	(0)
2005	0.006**	0.004	0.005*	0.119***	0.109***	0.101***
	(0.0414)	(0.1609)	(0.0797)	(0)	(0)	(0)
Sample Size (Maximum)	120	120	120	120	120	120

Table 12
Sub-Sample: Regression Analysis of Determinants of Option Backdating

This table provides linear probability and binomial probit estimation results of determinants of option backdating in the firms that are under backdating related investigations (Panel B), together with their peer companies matched with 2005 data (Panel C). Panel A shows the number of option grants in both firm types depending on different cut-off points, 90% and 75% of the sample distribution, and 0. In Panel B, the dependent variable is assigned to 1 for grants whose AR(+1,+20)-AR(-20,-1) exceed three these three thresholds, and 0 otherwise. In Panel C, the dependent variable is assigned to 1 for grants in backdating sample firms whose AR(+1,+20)-AR(-20,-1) exceed these three different thresholds, and 0 otherwise in peer companies. For the explanatory variables, firm size has proxy of log(market value) and firm age is the difference between the first year in which the firm has data in Compustat and the option grant year. Dispensable cash ratio is defined as cash subtracted by interest expenses, scaled by total assets, and growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. Also, return on assets is a ratio of EBIT (earnings before interest and tax) to total assets, stock volatility is the standard deviation of monthly stock prices, and CEO option holding ratio is option value (black-scholes) divided by total compensation. GIM index adopts Gompers et al. (2003). Specification (1)-(6) use linear probability model, and Specification (7)-(12) use binomial probit model for estimation. Standard deviations are reported in the parentheses and the symbols a, b, and c represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Number of Option Grants

	Threshold (1)		Threshold (2)		Threshold (3)		Total
	>90%	≤90%	>75%	≤75%	>0	≤0	
Sub-Sample Firm	45	253	89	209	171	127	298
Peer Group	42	378	111	309	203	217	420
Total	87	631	200	518	374	344	

Panel B

Panel C

Panel B: Backdating Sub-Sample

	Linear Probability Model						Binomial Probit Model					
Dependent Variable=1, if for grants in backdating firms, AR(+1,+20)-AR(-20,-1)	(1) >90%	(2) >90%	(3) >75%	(4) >75%	(5) >0	(6) >0	(7) >90%	(8) >90%	(9) >75%	(10) >75%	(11) >0	(12) >0
Size (t-1)	-0.026	-0.022	-0.024	-0.009	-0.046	-0.030	-0.036	-0.033	-0.027	-0.012	-0.049	-0.030
	(0.04)	(0.04)	(0.052)	(0.053)	(0.056)	(0.058)	(0.039)	(0.039)	(0.053)	(0.055)	(0.057)	(0.059)
Age (t)	-0.004	-0.003	-0.005	-0.005	0.005	0.005	-0.005[a]	-0.004	-0.006	-0.005	0.005	0.005
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)

Panel B: Backdating Sub-Sample												
	Linear Probability Model						Binomial Probit Model					
Dependent Variable=1, if for grants in backdating firms, AR(+1,+20)-AR(-20,-1)	(1) >90%	(2) >90%	(3) >75%	(4) >75%	(5) >0	(6) >0	(7) >90%	(8) >90%	(9) >75%	(10) >75%	(11) >0	(12) >0
Dispensable Cash Ratio (t-1)	0.099	0.118	0.112	0.222	-0.173	-0.117	0.085	0.110	0.097	0.226	-0.177	-0.131
	(0.161)	(0.16)	(0.208)	(0.209)	(0.225)	(0.23)	(0.148)	(0.143)	(0.208)	(0.214)	(0.229)	(0.235)
Market to Book Ratio (t-1)	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001
	(0)	(0)	(0.001)	(0.001)	(0.001)	(0.001)	(0)	(0)	(0.001)	(0.001)	(0.001)	(0.001)
Return on Assets (t-1)	0.006	-0.058	0.066	-0.004	0.178	0.128	0.038	-0.006	0.070	0.010	0.200	0.125
	(0.174)	(0.176)	(0.226)	(0.229)	(0.244)	(0.252)	(0.164)	(0.156)	(0.232)	(0.235)	(0.261)	(0.269)
Stock Volatility (t)	0.016[c]	0.013[b]	0.017[c]	0.012[a]	0.013[a]	0.008	0.013[c]	0.011[b]	0.017[c]	0.012[a]	0.015[a]	0.010
	(0.005)	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)	(0.004)	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)
CEO Option Holding Ratio (t)	-0.002	-0.043	-0.021	-0.069	0.058	0.018	0.004	-0.049	-0.022	-0.073	0.059	0.020
	(0.06)	(0.061)	(0.078)	(0.079)	(0.085)	(0.087)	(0.06)	(0.069)	(0.082)	(0.089)	(0.085)	(0.088)
GIM Index (t-1)	-0.024[b]	-0.026[b]	-0.017	-0.017	-0.035[b]	-0.035[b]	-0.020[b]	-0.023[b]	-0.017	-0.017	-0.037[b]	-0.038[b]
	(0.01)	(0.01)	(0.013)	(0.013)	(0.014)	(0.015)	(0.009)	(0.009)	(0.013)	(0.014)	(0.015)	(0.015)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.0778	0.1415	0.049	0.1037	0.0475	0.0721						
Adjusted R^2	0.0523	0.0926	0.0227	0.0527	0.0211	0.0193						
LR statistic							23.01	40.42	14.31	30.31	15.14	23.53
Pseudo R^2							0.0909	0.1598	0.0394	0.0834	0.0372	0.0579
Sample Size	298	298	298	298	298	298	298	298	298	298	298	298

Panel C: Backdating Sub-Sample and Peer Group												
	Linear Probability Model						Binomial Probit Model					
Dependent Variable=1, if for grants in backdating firms, AR(+1,+20)-AR(-20,-1) (and 0 if not so for grants in matched companies)	(1) >90%	(2) >90%	(3) >75%	(4) >75%	(5) >0	(6) >0	(7) >90%	(8) >90%	(9) >75%	(10) >75%	(11) >0	(12) >0
Size (t-1)	-0.050	-0.080[b]	-0.036	-0.075	0.005	0.002	-0.049[a]	-0.081[a]	-0.035	-0.094	0.006	-0.028
	(0.031)	(0.038)	(0.043)	(0.052)	(0.05)	(0.059)	(0.027)	(0.043)	(0.043)	(0.059)	(0.051)	(0.081)
Age (t)	-0.003[a]	-0.010[c]	-0.004[b]	-0.010[c]	-0.003	-0.014[c]	-0.004[b]	-0.008[c]	-0.006[b]	-0.009[c]	-0.004	-0.016[c]
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.004)
Dispensable Cash Ratio (t-1)	0.148	0.192	0.231	0.017	0.203	-0.159	0.112	0.034	0.212	-0.047	0.207	-0.340
	(0.115)	(0.152)	(0.155)	(0.197)	(0.193)	(0.227)	(0.093)	(0.145)	(0.151)	(0.218)	(0.198)	(0.319)
Market to Book Ratio (t-1)	0.001	0.001	0.001	0.001	-0.001	-0.000	0.002	0.005[a]	0.001	0.006	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.005)	(0.001)	(0.002)
Return on Assets (t-1)	-0.130	-0.188	0.065	-0.126	0.198	-0.101	-0.082	-0.131	0.067	-0.135	0.203	-0.192
	(0.157)	(0.194)	(0.217)	(0.257)	(0.252)	(0.286)	(0.128)	(0.204)	(0.214)	(0.297)	(0.262)	(0.424)
Stock Volatility (t)	0.015[c]	0.016[c]	0.017[c]	0.013[b]	0.014[b]	0.007	0.010[c]	0.011[b]	0.016[c]	0.013[a]	0.015[b]	0.012
	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)	(0.006)	(0.003)	(0.005)	(0.005)	(0.007)	(0.006)	(0.009)
CEO Option Holding Ratio (t)	0.072	0.090	0.033	0.120	0.041	0.100	0.058	0.043	0.021	0.142	0.040	0.152
	(0.054)	(0.057)	(0.074)	(0.08)	(0.084)	(0.091)	(0.046)	(0.069)	(0.075)	(0.102)	(0.086)	(0.124)
GIM Index (t-1)	-0.020[c]	-0.023[c]	-0.021[b]	-0.022[b]	-0.030[b]	-0.014	-0.015[c]	-0.016[a]	-0.020[a]	-0.018	-0.031[b]	-0.019
	(0.007)	(0.008)	(0.009)	(0.011)	(0.012)	(0.013)	(0.006)	(0.009)	(0.01)	(0.013)	(0.012)	(0.018)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.092	0.3525	0.0765	0.3491	0.0544	0.3683						
Adjusted R^2	0.0745	0.2674	0.0576	0.2575	0.0345	0.2768						
LR statistic							40.59	74.39	30.95	93.13	21.63	103.23
Pseudo R^2							0.1416	0.3236	0.0732	0.262	0.0406	0.227
Sample Size	423	423	398	398	388	388	423	293	398	320	388	330

Table 13
Sub-Sample: Summary of the Press Announcement Date

This table summarizes the earliest dates of press announcement revealing backdating practice, informal or formal probes, and rulings of sample firms from two sources, Factiva and WSJ. Companies with bold letters have replaced their CEOs and companies with grey area have their financial statements unchanged.

Company	The earliest news release date (Factiva)	The earliest news release date on WSJ report	The news release date of informal probe order	The news release date of formal probe order (SEC)	The news release date of ruling
Activision	June 19, 2006	July 28, 2006	July 28, 2006	June 7, 2007	
Affiliated Computer Services	Mar. 7, 2006	May 10, 2006	Mar. 7, 2006		
Affymetrix	July 31, 2006	Aug. 1, 2006			
Agile Software	Sep. 12, 2006	Oct. 26, 2006			
Alkermes	May 26, 2006	Aug. 10, 2006	26 May 2006		May 25, 2007 (no enforcement)
Altera	May 9, 2006	June 21, 2006	May 25, 2007		Feb. 20, 2007 (no enforcement)
American Tower	May 20, 2006	May 23, 2006	May 20, 2006		
Amkor Technology	June 12, 2006	Aug. 16, 2006	Sept. 15, 2006		
Analog Devices	Nov. 11, 2005	May 24, 2006	Nov. 11, 2005		Nov. 2005 (settled with SEC), now under US Attorney Apr. 24, 2007 (civil charges)
Apollo Group	June 10, 2006	June 9, 2006	June 10, 2006		
Apple Inc.	June 29, 2006	June 2006	Oct. 4, 2006		
Applied Micro Circuits	May 31, 2006	May 31, 2006	June 12, 2006		
Applied Signal Technology	Jan. 18, 2007	Jan. 16, 2007			
ArthroCare	Aug. 23, 2006	Aug. 23, 2006	Aug. 23, 2006		June 1, 2007 (no enforcement)
Aspen Technology	June 12, 2006	Sept. 6, 2006	June 12, 2006		
Asyst Technologies	June 14, 2006	June 7, 2006	June 7, 2006		Feb. 6, 2007 (no enforcement)
Atmel	July 25, 2006	Aug. 15, 2006	Aug. 15, 2006		
Autodesk	Aug. 18, 2006	Aug. 17, 2006	Sept. 5, 2006		
Barnes & Noble	July 12, 2006	July 12, 2006	July 21, 2006		
BEA Systems	Aug. 4, 2006	Aug. 16, 2006			
Bed, Bath & Beyond	Aug. 4, 2006	Oct. 10, 2006	Oct. 10, 2006		
Black Box	Nov. 17, 2006	Nov. 17, 2006	Nov. 17, 2006		
Blue Coat Systems	July 14, 2006	Aug. 3, 2006	Aug. 3, 2006		
Boston Communications Group	May 22, 2006	July 21, 2006	July 21, 2006		
Broadcom	May 18, 2006	May 18, 2006	June 12, 2006	Dec. 18, 2006	
Brocade Communications Systems	Nov. 11, 2005	Jan. 7, 2005	May 16, 2005		July 20, 2006 (criminal and civil charges); May 31, 2007 (Settled with SEC)
Brooks Automation	Mar. 18, 2006	Late Apr. 2006	May 12, 2006		
CA (Computer Associates)	June 29, 2006	June 29, 2006			
Cablevision	Aug. 8, 2006	Aug. 8, 2006	Aug. 16, 2006		
Caremark Rx.	May 19, 2006	May 18, 2006	May 18, 2006		
CEC Entertainment	Aug. 7, 2006	Aug. 11, 2006	Aug. 11, 2006		

3.8. Table and Figure

Company	The earliest news release date (Factiva)	The earliest news release date on WSJ report	The news release date of informal probe order	The news release date of formal probe order (SEC)	The news release date of ruling
Ceradyne	Aug. 2, 2006	Aug. 4, 2006	Oct. 24, 2006		
Chordiant Software	Aug. 10, 2006	July 24, 2006	July 25, 2006		Feb. 14, 2007 (no enforcement)
Cirrus Logic	Oct. 25, 2006	Oct. 24, 2006	Oct. 30, 2006		
Clorox	Aug. 2, 2006	Aug. 2, 2006			
CNET Networks	May 22, 2006	May 22, 2006	May 24, 2006		
Computer Sciences	May 29, 2006	June 29, 2006	June 29, 2006		
Comverse Technology	Mar. 18, 2006	April 2006	May 4, 2006		Aug. 9, 2006 (criminal charges); Jan. 10, 2007 (settled with SEC)
Corinthian Colleges	July 12, 2006	July 12, 2006	Aug. 18, 2006		
Costco Wholesale	Oct. 13, 2006	Mar. 19, 2007	Mar. 19, 2007		
Crown Castle International	Aug. 4, 2006	Aug. 4, 2006	Aug. 4, 2006		
Cyberonics	June 8, 2006	June 8, 2006	June 9, 2006		
Dean Foods	Aug. 4, 2006	Nov. 1, 2006	Nov. 1, 2006		May 10, 2007 (no enforcement)
Delta Petroleum	May 24, 2006	May 22, 2006	June 19, 2006		
Electronic Arts	July 19, 2006	Sept. 20, 2006	Sept. 20, 2006		
Emcore	Nov. 7, 2006	Nov. 6, 2006			
Endocare	Aug. 24, 2006	Aug. 1, 2006	Aug. 1, 2006		
Engineered Support Systems	May 14, 2006	June 12, 2006	June 12, 2006		Feb. 6, 2007 (civil charges)
EPlus	Aug. 11, 2006	Aug. 11, 2006			
Equinix	June 12, 2006	June 12, 2006	June 12, 2006		Dec. 6, 2006 (termination of SEC probe); Jan. 17, 2007 (withdrawal of grand jury subpoena)
Extreme Networks	Sept. 21, 2006	Sept. 15, 2006	Sept. 15, 2006		
F5 Networks	May 22, 2006	May 22, 2006	May 22, 2006		
Forrester Research	Dec. 20, 2006	Dec. 19, 2006			
Foundry Networks	June 28, 2006	June 27, 2006	June 27, 2006		
Getty Images	Nov. 9, 2006	Nov. 9, 2006	Nov. 9, 2006		
Hansen Natural	Oct. 29, 2006	Oct. 31, 2006	Oct. 31, 2006		
HCC Insurance Holdings	Aug. 11, 2006	Nov. 17, 2006	Nov. 17, 2006		
Home Depot	June 16, 2006	June 16, 2006	June 23, 2006		
IBasis	Sept. 11, 2006	Oct. 20, 2006	Oct. 20, 2006		
Insight Enterprises	Oct. 21, 2006	Oct. 31, 2006	Oct. 31, 2006		
Integrated Silicon Solution	Aug. 4, 2006	Oct. 23, 2006			
Intuit	June 9, 2006	June 9, 2006	June 9, 2006		Oct. 30, 2006 (no enforcement)
J2 Global	Aug. 7, 2006	Aug. 11, 2006			
Jabil Circuit	Mar. 18, 2006	May 3, 2006	May 3, 2006		
Juniper Networks	May 17, 2006	May 22, 2006	May 22, 2006		
KB Home	Aug. 4, 2006	Aug. 23, 2006	Aug. 24, 2006		
Keithley	Aug. 12, 2006	Sept. 14, 2006	Sept. 14, 2006		
King Pharmaceuticals	Nov. 10, 2006	Nov. 10, 2006			
KLA-Tencor	May 22, 2006	May 22, 2006	May 22, 2006	Feb. 9, 2007	

3.8. Table and Figure

Company	The earliest news release date (Factiva)	The earliest news release date on WSJ report	The news release date of informal probe order	The news release date of formal probe order (SEC)	The news release date of ruling
KOS Pharmaceuticals	Aug. 16, 2006	Aug. 8, 2006	July (Aug. 8, 2006)		
Linear Technology	May 22, 2006	May 24, 2006	June 15, 2006		
Macrovision	June 14, 2006	June 13, 2006	June 13, 2006		Nov. 2, 2006 (no enforcement); Feb. 13, 2007 (withdrawal of grand jury subpoena)
Marvell Technology Group	May 22, 2006	July 5. 2006	July 5, 2006		
Maxim Integrated Products	May 22, 2006	June 7, 2006	June 7, 2006		
McAfee Inc.	May 19, 2006	May 25, 2006	May 25, 2006	June 9, 2006	
Meade Instruments	May 22, 2006	May 22, 2006	June 13, 2006		
Medarex	May 24, 2006	May 24, 2006	May 24, 2006		
Mercury Interactive	Nov. 11, 2005	May 15, 2006	Nov. 11, 2005		May 31, 2007 (settled with SEC)
Michaels Stores	June 9, 2006	June 14, 2006	June 15, 2006		Sept. 7, 2006 (withdrawal of one grand jury subpoena, but received another one)
Microtune	Sept. 20, 2006	Sept. 20, 2006			
Mips Technologies	Aug. 31, 2006	Sept. 19, 2006	Sept. 19, 2006		
Molex	Aug. 3, 2006	Aug. 2, 2006	Oct. 5, 2006		
Monster Worldwide	June 12, 2006	June 12, 2006	June 12, 2006		Feb. 15, 2007 (plead guilty to criminal charges)
msystems	June 2, 2006	June 1, 2006	July 3, 2006		
Nabors Industries	Dec. 27, 2006	Dec. 27, 2006	Feb. 7, 2007		May 9, 2007 (no enforcement)
Newpark Resources	July 14, 2006	June 29, 2006			
Nvidia	June 9, 2006	Aug. 10, 2006			
Nyfix	Nov. 11, 2005	May 20, 2006	Nov. 11, 2005		
Openwave Systems	May 22, 2006	May 22, 2006	May 22, 2006		
Pediatrix	Aug. 3, 2006	Dec. 6, 2006	Dec. 6, 2006		
Pixar	Aug. 8, 2006	Nov. 9, 2006	Sept. 17, 2006		
PMC-Sierra	Aug. 14, 2006	Nov. 9, 2006	Nov. 9, 2006		
Power Integrations	Apr. 19, 2006	May 5, 2006	May 24, 2006		
Progress Software	June 21, 2006	June 19, 2006	June 27, 2006		
Quest Software	May 23, 2006	May 22, 2006	June 1, 2006		
QuickLogic	July 27, 2006	Aug. 7, 2006	Aug. 7, 2006		Mar. 23, 2007 (no enforcement)
Rambus	May 24, 2006	May 30, 2006			
Redback Networks	July 1, 2006	June 30, 2006	June 30, 2006		
Renal Care	May 22, 2006	June 2, 2006	June 2, 2006		
Research In Motion	Sept. 29, 2006	Sept. 28, 2006	Oct. 27, 2006		
Restoration Hardware	Nov. 1, 2006	Aug. 28, 2006			
RSA Security	May 20, 2006	June 13, 2006	May 20, 2006		
SafeNet	May 19, 2006	May 19, 2006	May 19, 2006		
Sanmina-SCI	June 10, 2006	June 9, 2006	June 9, 2006		
Sapient	Oct. 17, 2006	Oct. 17, 2006			

3.8. Table and Figure

Company	The earliest news release date (Factiva)	The earliest news release date on WSJ report	The news release date of informal probe order	The news release date of formal probe order (SEC)	The news release date of ruling
Semtech	May 23, 2006	May 22, 2006	May 22, 2006		
Sepracor	May 24, 2006	June 2, 2006	June 2, 2006		
Sharper Image	Sept. 7, 2006	Sept. 7, 2006			
Sigma Designs	July 27, 2006	July 26, 2006	July 26, 2006		
Silicon Image	Oct. 29, 2006	Oct. 31, 2006	Oct. 31, 2006		
Sonus Networks	Nov. 6, 2006	Nov. 6, 2006			
Stolt-Nielsen	June 3, 2006	June 1, 2006	July 6, 2006		
Sunrise Telecom	Sept. 20, 2006	Sept. 20, 2006	Sept. 20, 2006		
Sycamore Networks	May 23, 2006	May 23, 2006		May 23, 2006	
Take-Two Interactive Software	July 10, 2006	July 10, 2006	July 10, 2006		Feb. 14, 2007 (settled with SEC)
The Cheesecake Factory	July 18, 2006	July 19, 2006	Aug. 3, 2006		
THQ	July 18, 2006	Aug. 7, 2006	Aug. 7, 2006		
Trident Microsystems	May 22, 2006	May 26, 2006	2004, June 16, 2006 (Justice)		
UnitedHealth	Mar. 18, 2006	May 11, 2006	May 11, 2006	Dec. 26, 2006	
Valeant Pharmaceuticals	Sept. 11, 2006	Sept. 11, 2006	Sept. 11, 2006		
Verint	Apr. 18, 2006	Apr. 17, 2006	July 20, 2006		
VeriSign	June 27, 2006	June 27, 2006	June 27, 2006		
Vitesse Semiconductor	Mar. 18, 2006	Apr. 19, 2006	May 18, 2006		
Witness Systems	Aug. 9, 2006	Aug. 9, 2006	Oct. 30, 2006		
Xilinx	June 7, 2006	June 23, 2006	June 23, 2006		Nov. 30, 2006 (no enforcement)
Zoran	May 23, 2006	July 3, 2006	July 3, 2006		

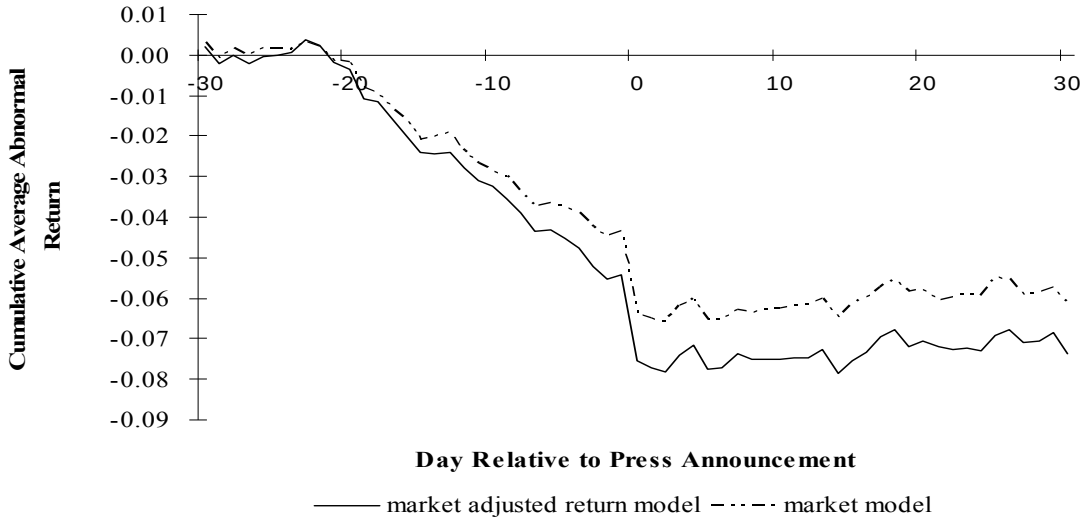

Fig. 1. Cumulative Abnormal Stock Returns Around Press Revealing Backdating Date

Figure1 displays the cumulative abnormal stock returns from 30 days before through 30 days after the earliest press release of backdating practice of the sample firms. Abnormal stock returns are estimated using the market model and market risk adjusted model, with equally-weighted market index excluding dividends, in which the estimation window lasts 255 days ending 45 days prior to the release. The release information is collected from Factiva and WSJ.

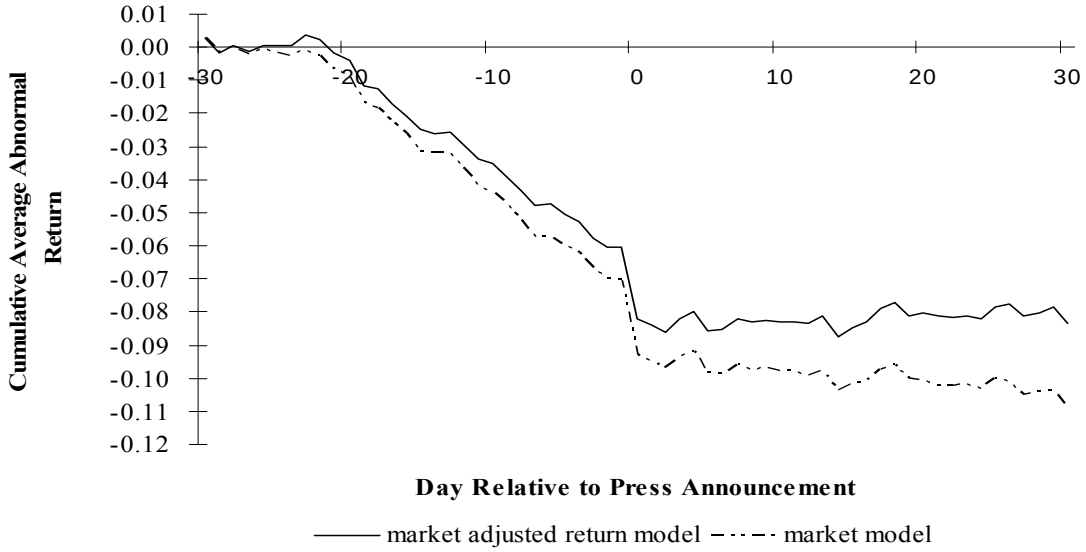

Fig. 2. Cumulative Abnormal Stock Returns Around Press Revealing Backdating Date

Figure2 displays the cumulative abnormal stock returns from 30 days before through 30 days after the earliest press release of backdating practice of the sample firms. Abnormal stock returns are estimated using the market model and market risk adjusted model, with value-weighted market index excluding dividends, in which the estimation window lasts 255 days ending 45 days prior to the release. The release information is collected from Factiva and WSJ.

Table 14
Sub-Sample: Corporate Fraud and Reputation Risk

Panel A gives a summary of number of Accounting and Auditing Enforcement Releases (AAERs) issued by the SEC, the number of Securities Class Action Filings (SCAFs) from the Stanford Securities Class Action Clearinghouse (SSCAC), and cumulative abnormal stock return (CAR) of each individual firm in the sample. In particular, for the CAR, three sub-periods are estimated by market adjusted return model with value weighted index excluding dividends. Panel B reports the correlation matrix.

Panel A: Summary					
Company	# of AAERs	# of SCAFs	Cumulative Abnormal Return (%) (-1,0)	(-30, 0)	(-30,30)
Activision	0	1	3.51	-10.79	-15.37
Affiliated Computer Services	0	0	1.07	10.97	-0.94
Affymetrix	0	1	-2.52	-26.46	-31.49
Agile Software	0	1	-0.63	6.16	10.89
Alkermes	0	1	8.27	-1.17	-12.09
Altera	0	0	-3.42	-0.45	-9.65
American Tower	0	0	-13.78	-9.72	53.66
Amkor Technology	0	0	-6.80	-8.95	-14.83
Analog Devices	0	0	2.12	2.69	-1.76
Apollo Group	0	1	-1.71	-23.46	-29.79
Apple Inc.	0	1	-0.01	-6.98	3.10
Applied Micro Circuits	0	1	-4.60	-17.47	-38.69
ArthroCare	0	0	-1.88	5.86	10.00
Aspen Technology	2	2	-3.21	-30.85	-49.24
Asyst Technologies	0	0	-2.65	1.78	-13.43
Atmel	0	3	-11.32	-6.19	23.15
Autodesk	0	1	2.34	2.18	-0.14
Barnes & Noble	0	0	-1.08	-8.22	-5.98
BEA Systems	0	1	1.90	-3.68	2.55
Bed, Bath & Beyond	0	0	3.04	-7.53	-3.21
Black Box	0	1	-1.73	2.40	-1.06
Blue Coat Systems	0	1	-15.32	-6.30	10.62
Boston Communications Group	0	2	7.60	-6.81	-29.90
Broadcom	0	1	3.01	4.14	6.17
Brocade Communications Systems	0	1	-8.77	-6.69	-7.72
Brooks Automation	0	0	-0.06	-6.88	-22.88
CA (Computer Associates)	10	1	-3.07	-7.51	-1.88
Cablevision	0	0	1.93	6.00	4.64
Caremark Rx.	0	0	2.77	-15.02	-32.69
CEC Entertainment	0	0	-0.72	-8.01	-0.20
Ceradyne	0	0	-6.55	0.31	-7.97
Chordiant Software	0	1	2.36	-15.04	-14.83
Cirrus Logic	0	0	-4.91	-7.02	-2.93
Clorox	0	1	-0.51	-4.16	-5.81
CNET Networks	0	0	-2.31	-13.47	-14.68
Computer Sciences	0	0	-0.04	-1.68	-3.78
Comverse Technology	0	1	-2.53	-19.73	-23.30
Corinthian Colleges	0	2	-0.93	1.16	-8.75
Costco Wholesale	0	0	4.97	8.30	7.15
Crown Castle International	0	0	6.72	-0.46	-1.38
Cyberonics	0	1	1.84	8.24	-5.33
Dean Foods	0	0	-0.09	3.01	10.06
Delta Petroleum	0	0	0.41	-2.84	-7.17
Electronic Arts	0	1	-0.32	12.62	19.72
Emcore	0	0	-6.76	-10.18	-7.80

3.8. Table and Figure

Panel A: Summary

Company	# of AAERs	# of SCAFs	Cumulative Abnormal Return (%) (-1,0)	(-30, 0)	(-30,30)
Eplus	0	0	-1.90	5.34	7.51
Equinix	0	1	-7.34	-32.05	-33.22
Extreme Networks	0	1	-2.84	-10.76	-5.18
F5 Networks	0	1	0.00	-35.85	-59.52
Forrester Research	0	0	-1.73	-12.49	-18.32
Foundry Networks	0	2	-3.91	-0.42	-22.07
Getty Images	0	0	-0.79	-16.87	-23.90
Hansen Natural	0	0	-14.38	-5.76	0.30
HCC Insurance Holdings	0	0	-0.33	-21.29	-22.44
Home Depot	0	1	-1.48	-2.70	-10.57
Ibasis	0	1	-0.99	12.06	6.33
Insight Enterprises	0	1	-5.51	9.49	4.54
Integrated Silicon Solution	0	0	-3.63	0.88	1.67
Intuit	0	0	-3.94	-1.35	15.25
J2 Global	0	0	-5.01	-20.34	-19.92
Jabil Circuit	0	0	1.83	-5.07	-4.49
Juniper Networks	0	2	1.69	-8.08	-11.68
KB Home	0	0	-7.20	-16.65	9.27
Keithley	0	1	-1.98	-9.64	-3.03
King Pharmaceuticals	0	1	3.06	-7.57	-11.01
KLA-Tencor	0	0	4.84	-15.52	-17.15
KOS Pharmaceuticals	0	1	1.83	9.82	22.54
Linear Technology	0	0	-5.71	-60.13	-59.06
Macrovision	0	0	-0.11	-4.83	-5.02
Marvell Technology Group	0	1	-11.22	-18.61	-55.16
Maxim Integrated Products	0	0	-1.91	-36.89	-50.41
McAfee Inc.	3	0	-3.63	-0.69	0.10
Meade Instruments	0	0	-1.50	13.64	2.78
Medarex	0	0	-4.18	-5.43	-20.43
Mercury Interactive	0	0	-1.41	-26.59	-23.95
Michaels Stores	0	1	-2.64	6.98	-4.43
Microtune	1	2	-3.27	-1.00	-18.16
Mips Technologies	0	0	-1.97	17.75	17.69
Molex	0	1	2.92	-5.00	9.08
Monster Worldwide	1	0	6.02	-5.37	-1.14
msystems	0	0	-14.19	-3.36	-12.12
Nabors Industries	0	0	-1.75	-7.04	-12.33
Newpark Resources	0	0	-1.57	-1.31	0.21
Nvidia	2	1	0.02	-5.25	-26.33
Openwave Systems	0	2	-14.28	-12.15	-18.94
Pediatrix	0	2	2.57	-3.18	4.92
PMC-Sierra	0	0	-0.78	-45.63	-34.51
Power Integrations	0	0	4.78	0.98	-30.59
Progress Software	0	0	-1.64	-7.52	-4.91
Quest Software	0	2	-4.21	-12.50	-22.99
QuickLogic	0	1	-26.01	-41.44	-58.73
Rambus	0	1	2.66	8.96	19.15
Redback Networks	0	3	3.12	-14.50	-21.79
Research In Motion	0	0	-2.25	10.90	46.95
Restoration Hardware	0	0	0.80	-6.93	28.23
RSA Security	1	0	-6.21	-0.56	7.44
SafeNet	0	0	-23.56	-46.48	-27.04
Sanmina-SCI	0	0	-0.97	6.95	17.93
Sapient	0	0	-11.81	1.31	6.18

3.8. Table and Figure

Panel A: Summary

Company	# of AAERs	# of SCAFs	Cumulative Abnormal Return (%) (-1,0)	(-30, 0)	(-30,30)
Semtech	0	0	3.97	-18.72	-15.67
Sepracor	0	1	5.00	-36.60	-43.64
Sharper Image	0	1	-1.91	-17.60	-7.61
Sigma Designs	0	1	-1.34	-23.73	28.43
Silicon Image	0	3	-5.69	-7.52	2.40
Sonus Networks	0	3	2.54	-6.69	15.26
Stolt-Nielsen	0	0	-0.50	-0.51	-13.88
Sycamore Networks	0	2	3.08	15.21	11.94
Take-Two Interactive Software	3	2	-7.99	-46.02	-16.27
The Cheesecake Factory	0	0	-2.58	-7.80	13.63
THQ	0	1	-2.76	-14.35	-17.20
Trident Microsystems	0	0	-8.70	-13.77	-14.46
UnitedHealth	0	2	3.25	22.26	-31.41
Valeant Pharmaceuticals	0	0	-3.69	-1.50	-12.97
Verint	0	0	-2.43	-7.40	-9.22
VeriSign	0	1	-1.23	-29.37	-27.93
Vitesse Semiconductor	0	0	-5.96	-17.59	-13.99
Witness Systems	0	0	-6.87	-30.84	-8.33
Xilinx	0	0	0.28	-27.75	-23.10
Zoran	0	0	6.39	-3.30	-12.02
Mean	0.19	0.63	-2.14	-8.25	-8.43

Panel B: Correlation Matrix

	# of AAERs	# of SCAFs	CAR(-1,0)	CAR(-30, 0)	CAR(-30,30)
# of AAERs	1				
# of SCAFs	0.098	1			
CAR(-1,0)	-0.039	0.033	1		
CAR(-30, 0)	-0.060	-0.006	0.319	1	
CAR(-30,30)	-0.015	-0.077	0.082	0.637	1

Table 15
Sub-Sample: Regression Analysis of Reputation Risk

This table provides OLS estimation of reputation risk, measured by the cumulative abnormal stock return during the revelation of backdating. AAERs are the Accounting and Auditing Enforcement Releases issued by the SEC, and SCAFs are the Securities Class Action Filings from the Stanford Securities Class Action Clearinghouse (SSCAC), both a proxy for corporate fraud. For explanatory variables, firm size has proxy of log(sales), growth opportunity is the market-to-book ratio defined as the market value of assets divided by the book value of total assets, i.e. the book value of assets plus the market value of common stock less the sum of book value of common equity and balance sheet deferred taxes. More, return on assets is a ratio of EBIT (earnings before interest and tax) to total assets. Panel A reports the correlations between explanatory variables, and Panel B displays the estimation results, in which some models control for industry effects coded using the first 2-digit NAICS codes. P-values are reported in the parentheses and the symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Correlations

	Size - log(sales)	Market to Book Ratio	Return on Assets	GIM Index	AAERs	GIM*AAERs	SCAFs	GIM*SCAFs
Size - log(sales)	1							
Market to Book Ratio	-0.145	1						
Return on Assets	0.325	-0.072	1					
GIM Index	0.073	0.048	0.030	1				
AAERs	0.082	-0.023	0.055	0.104	1			
GIM*AAERs	0.082	-0.021	0.049	0.118	0.994	1		
SCAFs	-0.121	0.035	-0.115	0.021	0.079	0.067	1	
GIM*SCAFs	-0.109	0.048	-0.124	0.155	0.098	0.094	0.970	1

Panel B: Estimation Results

Dependent Variable	CAR(-1,0)			CAR(-30,0)		
	(1)	(2)	(3)	(1)	(2)	(3)
Size - log(sales)	0.00485	0.00475	0.01115	0.01397	0.01328	0.01806
	(0.4362)	(0.4468)	(0.2382)	(0.5263)	(0.5480)	(0.5332)
Market to Book Ratio	0.00016**	0.00016**	0.00020**	0.00081***	0.00081***	0.00094***
	(0.0412)	(0.0435)	(0.0205)	(0.0035)	(0.0037)	(0.0019)
Return on Assets	0.00822**	0.00841**	0.00734	0.01095	0.01222	0.01135
	(0.0474)	(0.0443)	(0.1099)	(0.2086)	(0.1532)	(0.2610)
GIM Index	0.00420*	0.00389	0.00336	0.01109	0.00901	0.00649
	(0.0802)	(0.1057)	(0.2616)	(0.1288)	(0.1953)	(0.4517)
AAERs	-0.00504**	-0.04213***	-0.03898***	-0.01337	-0.25987***	-0.26523***
	(0.0204)	(0.0029)	(0.0064)	(0.2804)	(0)	(0.0003)
GIM Index*AAERs		0.00386***	0.00363***		0.02567***	0.02618***
		(0.0057)	(0.0072)		(0)	(0.0003)
Industry Effects	No	No	Yes	No	No	Yes
R^2	0.132	0.142	0.243	0.072	0.119	0.207
Adjusted R^2	0.085	0.086	0.046	0.021	0.061	0.001
Sample Size	98	98	98	98	98	98