

Executive Stock Option Exercises: Good Timing or Backdating?

Jie (Jay) Cai*

**Drexel University
LeBow College of Business
Department of Finance
Phone: (215)-895-1755
Fax: (215)-895-2955
Email: jaycai@drexel.edu**

Abstract

Using a large sample of executive stock option exercises by the CEOs of U.S. firms during 1997-2005, I identify three popular exercise mechanisms with different backdating incentives. A cash exercise offers an incentive to exercise at a lower stock price, a stock exercise offers an incentive to exercise at a higher stock price, and a cashless exercise offers little opportunity for backdating. Given the different directions of incentive effects, it becomes critical to separate the three types of option exercises. Empirical results show that for cash exercises the average abnormal stock return is significantly negative before the reported exercise date and significantly positive afterwards. In contrast, stock exercises have the opposite stock return pattern. The market return follows similar but weaker patterns. I estimate that prior to the Sarbanes-Oxley Act (SOX) around one out of eight cash exercises and one out of twenty stock exercises were backdated or otherwise manipulated. Finally, all return patterns become weaker after SOX shortens the reporting period.

First version: December 2006

This version: March 2007

* I thank Eli Fich, Yaniv Grinstein, Guojin Gong, Randy Heron, Erik Lie, Urs Peyer, Anand Vijh, and Ralph Walkling for their comments.

Executive Stock Option Exercises: Good Timing or Backdating?

I. Introduction

In recent years stock options have become a large part of compensation to senior executives of U.S. firms. Murphy (2003) documents that around the turn of the century stock options and other stock-based compensation accounted for roughly half of the total pay to the Chief Executive Officers (CEOs) of old-economy firms and four-fifths of the total pay to the CEOs of new-economy firms. Not surprisingly, the valuation and exercise policies of executive stock options and their incentive effects have become an area of active research in the finance literature.

More recently, the finance literature has focused on illegal option grant practices that result in higher CEO compensation than what is reported to shareholders in proxy statements. The evidence starts with Yermack (1997) who shows that stock options granted to CEOs during 1992-1994 precede average abnormal stock returns of 2% during a subsequent 50-day period. He attributes this result to the good timing abilities of CEOs. Aboody and Kasznik (2000) document similar patterns during 1992-1996, and they also find that CEOs manage the timing of their voluntary disclosures around option grant dates. Lie (2005) re-examines the evidence with an expanded sample during 1992-2002. He finds stronger price decreases before grant dates and price increases after grant dates combined with weaker but parallel patterns in market returns. He reasons that it is unlikely for CEOs to predict the subsequent market returns, so they must be choosing grant dates with the benefit of hindsight. This practice is now well-known as backdating. Heron and Lie (2006a) document that the price patterns weaken considerably after August 29, 2002, when the Sarbanes-Oxley Act (SOX) started requiring executives to file with the Securities and Exchanges Commission (SEC) within two days of an option grant instead of 45 days after the fiscal year-end. More interestingly, they show that the price patterns disappear for grants reported by the following day. This last evidence is inconsistent with the existence of good timing abilities, since such abilities should be unaffected by changes in filing requirements. Collins, Gong, and Li (2005a, b) and Narayanan and Seyhun (2006) provide additional evidence consistent with the backdating of option grants. Finally, the backdating of option grants is related to corporate governance. Bebchuk, Grinstein,

and Peyer (2006a, b) find that executive and director options are more likely to be backdated when the firm does not have an independent board. Bizjak, Lemmon, and Whitby (2006) find that interlocking boards play a significant role in backdating option grants.¹

Several reports in the *Wall Street Journal* and other media sources suggest that backdating has been a hot issue in the practitioner world during 2006. The Securities and Exchanges Commission (SEC) has launched investigations of over one hundred cases of possible backdating and numerous shareholder lawsuits have been filed against firms, CEOs, and directors. Given the cumulative evidence that some CEOs may have backdated their grant dates, a natural question arises as to whether they may also have backdated option exercises. The possibility exists, since before SOX the firm insiders were required to report their option exercises during a calendar month only by the tenth day of the following month. Backdating option exercise dates can reduce tax liability to the CEOs in some cases and make firms pay a higher price for shares sold by the CEOs as payment of exercise price in other cases.

Heron and Lie (2006a) identify a couple of instances where option exercises were backdated, but otherwise suggest that the practice may not be widespread. In this paper I re-examine this issue and find strong evidence consistent with backdating of option exercises. The difference between Heron and Lie and my results arises from a finer classification of option exercises in my paper. I investigate three popular mechanisms of option exercise and show that they offer incentives in different directions to CEOs willing to backdate their option exercises. These mechanisms are briefly described as follows. First, in the case of a cash exercise the CEO pays cash to exercise his options and holds the stock for some period after exercise. He has an incentive to understate the stock price, which decreases his ordinary income at the time of exercise and increases his capital gains at the time of a later stock sale. He benefits by an amount equal to the difference between the ordinary income tax rate and the capital gains tax rate, which translates into a post-tax saving of about \$0.20 from understating the stock price at exercise by \$1.

Second, in the case of a stock-swap exercise (which I often abbreviate as stock exercise) the CEO pays the exercise price by selling some of his previously-held stock to the firm. This mechanism

¹ I am aware of two contemporaneous working papers related to my study: Cicero (2007) and Dhaliwal, Erickson, and Heitzman (2007).

combines two transactions: an option exercise and a stock sale. The first transaction benefits from understating the stock price similar to the case of a cash exercise, but the second transaction benefits from overstating the stock price. Using typical parameters, I illustrate that the second incentive dominates in value. The combined incentive is smaller in this case, on the order of \$0.11 for every \$1 increase in exercise price, but remarkably it is in the opposite direction of a cash exercise.

Third, in the case of a cashless exercise the CEO simultaneously exercises the option and sells the stock either in the open market through a firm-appointed broker or to a private third party. The open-market stock sale makes it infeasible to understate or overstate the stock price at the time of exercise, although backdating may still be possible when the stock is sold to a private third party. However, the third party would be unwilling to buy the stock from the CEO at an inflated price unless it can benefit from elsewhere, such as favorable business treatment from the CEO's firm. The risk of being caught backdating is also greater since it involves parties outside the firm. Thus, I conjecture that the cashless exercises are much less likely to be backdated than the cash exercises and stock exercises discussed above.

I calculate that in general the incentives to backdate option exercises to a higher or lower stock price are smaller than the incentives to backdate option grants. Understating the exercise price by \$1 on grant date should benefit the CEO by an amount approximately equal to one minus the ordinary income tax rate multiplied by the probability of exercise, which may be in the order of $(1-0.35) \times 0.75 = \$0.49$. However, given the size and frequency of option exercises, the aggregate incentive to backdate option exercises may be still quite substantial. I treat this as an empirical matter.

Given the different directions of incentive effects, it becomes critical to separate all option exercises into cash exercises, stock exercises, and cashless exercises. I accomplish this by using the information available in Thomson Financial's Insider Filing Database. My sample period spans 1997-2005, which I divide into a pre-SOX subperiod, from January 1, 1997, to August 28, 2002, and a post-SOX subperiod, from August 29, 2002, to December 31, 2005. Given that some option exercises involve a small number of shares, less than in the case of most option grants, I further confine my attention to exercises with at least 10,000 shares. My main results are as follows.

First, I find that during the pre-SOX period cash exercises are preceded by an average abnormal stock return of -1.97% over a 15-day period ending on the exercise date and followed by a return of 5.13% over a 15-day period starting after the exercise date. Both returns are statistically significant in absolute terms and significantly different from corresponding returns for cashless exercises that are much less likely to be backdated. In sharp contrast, the pre-exercise and post-exercise average abnormal stock returns equal 4.31% and -0.65% for stock exercises where I predict that the CEO benefits from overstating the stock price at exercise. Graphs of cumulative abnormal stock returns starting 15 days before exercise date and ending 15 days later for cash exercises and stock exercises look like the opposite of each other, with a pronounced “valley” and a “hill” coinciding with the reported exercise date. In an unreported sensitivity test, I find that the raw stock returns follow a similar pattern as the abnormal returns.

Second, I find that the above return patterns become weaker but remain noticeable and statistically significant during the post-SOX period. I infer that SOX reduces backdating in option exercises, yet some backdating activity remains. The post-SOX evidence also distinguishes the backdating hypothesis from the private-information hypothesis or the good-timing hypothesis. If the pre-exercise and post-exercise return patterns for cash exercises and stock exercises merely reflect the timing abilities of CEOs as under these alternate hypotheses, then there is no reason for diminished return patterns during later years. Besides, I find a significant increase in the frequency of cashless exercises during the post-SOX period, which are unlikely to be backdated. I attribute this result to the reduced opportunity for backdating in view of the two-day reporting period.

Third, following Heron and Lie (2006a), I examine the abnormal market returns around option exercises. Interestingly, market returns tend to follow the pattern of stock returns during the pre-SOX period, although the magnitudes are smaller. This evidence further supports the backdating hypothesis. Apparently, the CEOs who backdate their option exercises to coincide with a more advantageous stock price do not differentiate between whether that price is the result of stock-specific or market-wide factors. This evidence is further inconsistent with the private-information or the good-timing hypotheses, which usually attribute timing abilities to the stock-specific component of returns.

Fourth, I compare the return patterns for large option exercises (involving 10,000 to 99,999 shares) and very large option exercises (100,000 or more shares). I find some evidence for cash exercises that very large transactions are associated with significantly more pronounced return patterns than just large transactions.

Fifth, following Heron and Lie (2006b) and Bebchuk et al. (2006a, b), I compare the stock price on the reported exercise to the rest of the calendar month. I estimate that during the pre-SOX period the timing and the associated stock price of about 12.4% cash exercises and 4.8% stock exercises were manipulated.

I conclude that the combined evidence of this paper is consistent with the proposition that some CEOs backdate their option exercises to their advantage. In the process, in some cases they reduce their taxes, and in some cases make their firms purchase their previously-held shares at an above-market price on the date when they really decide to exercise their options. However, I would like to emphasize that my results are based on averages, and may be driven by the backdating behavior of a subset of CEOs. As a necessary implication, however, this subset of CEOs may be realizing illegal wealth gains of a higher magnitude than those documented in this study.

The remainder of the paper is organized as follows: Section II discusses the different mechanisms of option exercise, their tax implications, and the backdating incentives. Section III discusses the data and methods, and Section IV presents the empirical results. Section V concludes.

II. Mechanisms of option exercise and backdating incentives

The academic finance literature typically treats an option exercise as the simple payment of a cash price and the receipt of shares. However, I find that there are three main mechanisms of option exercise – cash exercise, stock exercise, and cashless exercise – that differ considerably in how the payment is made and whether the stock is retained. Below I describe each mechanism, the associated tax

treatment, and the incentives to report a different exercise date with a higher or lower stock price. I restrict my attention to non-qualified stock options (NSO) that constitute the bulk of all options.²

A. Cash exercise

A cash exercise is the simplest mechanism in which the CEO pays the strike price of $\$X$ per option in cash and receives one share of stock from his firm priced at $\$S_t$ at the time of exercise t . While this mechanism resembles the traditional exercise of exchange-traded options in many respects, there is one significant difference. In many cases, the issuer of the option, the firm, loans the cash amount of $\$X$ to the CEO. Such executive loans were widespread before SOX, and Kahle and Shastri (2004) document that in their sample 28% of all executive loans were made for the purpose of option exercise. The loans were often made at below-market interest rates, which made cash exercises quite attractive.³ SOX prohibits executive loans, but Baker (2006) suggests that some firms continue to assist employees in obtaining third-party loans at favorable terms.

To understand the tax treatment, let us assume that the stock received upon exercise is later sold for $\$S_T$ at time T . I describe the tax treatment for one option, and the tax treatment for N_o options can be obtained by multiplying all expressions by N_o . At the time of exercise t , the CEO pays ordinary income tax at a rate of T_o on the exercise gains of $\$(S_t - X)$, for a net tax of $\$T_o(S_t - X)$. The received stock has a tax basis of $\$S_t$ and the holding period for subsequent capital gains or losses starts at t . At the time of a final sale at T , the CEO pays an additional capital gains tax of $\$T_c(S_T - S_t)$, where T_c is the capital-gains

² I do not include the incentive stock options (ISO) as their tax treatment is very different from non-qualified stock options (NSO). No tax is due on the exercise date of ISOs, and the entire difference between the stock price at the time of final sale (minimum one year later) and the strike price is treated as capital gains. The stock price at exercise thus does not affect the ultimate tax liability, although it does affect the interim alternative minimum tax (AMT) that can be later claimed as a credit.

³ Kahle and Shastri (2004) also document that in the vast majority of cases the loans were secured by the stock received upon exercise, and that in a minority of cases the loan was forgiven if the stock subsequently underperformed. The median term of the loan was five years.

tax rate.⁴ Ignoring the below-market and tax-deductible interest charge on loan, the total tax payment equals $\$T_o(S_T - X) + T_c(S_T - S_t)$. Alternatively, the net proceeds, NP, after repayment of loan and all taxes at T equal $\$[S_T - X - T_o(S_T - X) - T_c(S_T - S_t)]$. Notice the partial derivative of NP with respect to S_t equals $-T_o + T_c$. Given that the capital-gains tax rate T_c is at most equal to the ordinary income tax rate of T_o (for short-term capital gains) and usually much lower (for long-term capital gains), on average this partial derivative has a negative value. It follows that understating the stock price at exercise by \$1 leads to a tax saving of $T_o - T_c$ to the CEO. Notice this result does not depend on whether S_T is higher than S_t (i.e., later capital gain) or S_T is lower than S_t (i.e., later capital loss). For most of the period covered by my study, this difference has been around 0.20.

To complete the picture, I examine the tax implications to the firm. The gains from exercise to the CEO result in an equal and opposite deductible expense to the firm. This lowers the firm's tax bill by $\$T_{o,f}(S_T - X)$, where $T_{o,f}$ is the ordinary income tax rate of firm. It follows that understating the stock price at exercise by \$1 has a net cost to the firm of $\$T_{o,f}$. For profitable firms, the tax rate $T_{o,f}$ is usually comparable to T_o . Thus, combining the tax implications to the CEO and the firm at the time of initial exercise and the final sale, there is a net loss of $[(T_{o,f}) - (T_o - T_c)] \approx T_c$. In effect, the IRS ends up as a winner if the stock price at the time of exercise is understated. The losers are the firm's outside shareholders, as the result of a lower tax shield to the firm. In contrast, for unprofitable firms, the tax rate $T_{o,f}$ is close to zero, so there is a net gain to the combined entity in the approximate amount of $T_o - T_c$. The IRS ends up as a loser in this case, while the outside shareholders are relatively unaffected.⁵ Understating the stock price at exercise clearly benefits the CEO, regardless of the combined implications to the CEO and the firm. Thus, if I assume that the CEO maximizes his own utility, the incentive to choose an exercise date with a lower stock price exists.

⁴ The tax treatment of cash exercises is covered by Section 83 of the tax code.

⁵ One may argue that unprofitable firms generate valuable tax shields, so the effective tax rate is always positive. In that case, the tax implications will be somewhere between the two scenarios considered above.

B. Stock exercise

Many firms allow the executive to sell previously-held stock (old shares) to the firm at fair market value for the purpose of option exercise. Suppose the CEO holds a sufficient number of old shares. In order to exercise N_o options at a strike price of $\$X$ at time t , he simply hands over $N_o X/S_t$ old shares, which have a fair market value of $\$N_o X$. He then receives N_o shares from exercise, of which $N_o X/S_t$ shares are termed as replacement shares and the remaining $(N_o - N_o X/S_t)$ shares are termed as new shares. The tax code treats the tax basis and the holding period for replacement shares as identical to the old shares sold to the firm, so the net effect of stock exercise is the receipt of $(N_o - N_o X/S_t)$ new shares. The CEO pays taxes on exercise gains of $\$N_o(S_t - X)$, in the amount of $\$N_o(S_t - X)T_o$, but makes no other cash payment. His tax basis in new shares becomes $\$N_o(S_t - X)/(N_o - N_o X/S_t)$, or $\$S_t$ per share. The holding period for subsequent capital gains starts on the exercise date.⁶

On a per option basis, it is easy to see that the net effect of stock exercise is to make the firm pay the CEO the exercise proceeds of $\$(S_t - X)$ in the form of $(S_t - X)/S_t$ new share. I further assume that the CEO makes cash payment of tax, although later I consider that many firms allow the CEO to pay the withholding tax with additional shares of old stock. If the CEO subsequently sells the new shares at T , he realizes total capital gains of $\$(N_o - N_o X/S_t)(S_T - S_t)$ on new shares, and pays capital-gains tax of $\$(N_o - N_o X/S_t)(S_T - S_t)T_c$. Ignoring interest charge as before, his net proceeds, NP, at time T from stock exercise equal $\$[(N_o - N_o X/S_t)S_T - N_o(S_t - X)T_o - (N_o - N_o X/S_t)(S_T - S_t)T_c]$. Before deriving the incentive effects, I consider one interesting case of stock exercise in the limit. Suppose $T \rightarrow t$, i.e., the CEO sells the new shares an instant after exercise. In this case, $S_T \rightarrow S_t$, and the net proceeds equal $\$N_o(S_t - X)(1 - T_o)$, which equal the proceeds from cashless exercise as shown below.

To understand the motives for manipulating the exercise date and price, I again take the partial derivative of net proceeds, NP, with respect to S_t . This derivative equals $[(-T_o + T_c) + X S_t(1 - T_c)/S_t^2]$ on a per option basis. While the first term in parentheses is identical to the case of cash exercise, the second

⁶ The tax treatment of replacement shares and new shares is covered by Sections 1031(d), 1036, and 1223(1) of the tax code.

term is new, and it changes the direction of incentive effects. For an illustration, consider the following typical parameter values: $T_o=0.35$, $T_c=0.15$, $X/S_t=1/3$, and $S_T/S_t=1.12$. Then, the net proceeds increase by $[(-0.35+0.15)+(1-0.15)\times 1.12/3] = [-0.20+0.317] = 0.117$ as S_t increases by \$1. The second term provides an incentive to overstate the stock price at the time of stock exercise, which contrasts with the first term that provides an incentive to understate the stock price (similar to the case of cash exercise).

The intuition behind this result is as follows. A stock exercise involves two transactions between the CEO and his firm: an option exercise and a sale of stock. The first transaction leads to similar incentives to understate the stock price at the time of exercise in both cash exercise and stock exercise cases. The second transaction, however, benefits from overstating the stock price, which leads to the sale of fewer old shares. For the average X/S_t value of around $1/3$ and average annual stock return of around 12%, this term tends to dominate in value. However, if in certain cases X/S_t is very low (deep-in-the-money options), then the combined incentive may be to understate the stock price at exercise. Overall, I expect that the CEO will have an incentive to overstate the stock price at exercise in the case of stock exercise, but I also expect this incentive will be weaker than in the case of cash exercise due to the mix of transactions and parameter values.

I last consider the case that some firms allow the CEO to pay withholding taxes at the time of exercise with sale of additional old shares. Without going into more expressions, this should strengthen the incentive to overstate the stock price at the time of exercise.

C. Cashless exercise

In a cashless exercise, the executive also sells his previously owned stock to pay for the option exercise price. Thus, he also has the incentive to exercise the option at a higher stock price. However, unlike a stock exercise in which the stock is sold to the company, the stock is sold in the open market or to a private third party in a cashless exercise. When the stock is sold in the open market, the cashless exercise is a complex transaction that involves the near simultaneous short sale of stock on behalf of the CEO by a broker appointed by the firm, the option exercise, and the delivery of shares to close out the

short position. The requirement of an open market sale and delivery of stock makes it very difficult to alter the exercise date or the associated stock price.

When the stock is sold to a private third party, the option exercise could be backdated, but it requires the cooperation of the third party. The executive's gain from selling the stock at an inflated price is the third party's loss. Thus, the third party has no incentive to cooperate in backdating the option exercise unless it receives compensation from elsewhere, possibly from favorable business transactions with the CEO's firm. Therefore, a backdated cashless exercise can potentially be more costly to the firm than a backdated cash exercise or stock exercise. Unfortunately, I cannot empirically determine whether in a cashless exercise the stock is sold in the open market or to a private third party since they have the same transaction code in SEC filings. Overall, I conjecture that the cashless exercises are less likely to be backdated given its mixture of open market transaction and private stock sale.

D. Empirical implications

Previous research has shown that some CEOs backdate their option grants to obtain favorable exercise prices for their options. I expect that the presence of such CEOs in my sample will lead to different return patterns before and after different mechanisms of option exercise. First, in the presence of backdating, I expect the following patterns for cash exercises: 1. Both the abnormal stock returns and the abnormal market returns over an adjacent period before exercise will be significantly lower than for cashless exercises. 2. Both the abnormal stock returns and the abnormal market returns over an adjacent period after exercise will be significantly positive. Second, I expect the opposite but weaker return patterns for stock exercises.

Notice that I generally cannot make absolute statements for returns before exercise. This is because, absent illegal practices, it is a natural implication of option valuation models that exercises occur after periods of positive stock and market returns. I can only make relative statements by using the cashless exercises as a benchmark that are less influenced by backdating. However, I can and do make absolute statements for returns after exercise. This is because it is also a natural implication of the efficient markets hypothesis that subsequent returns after exercise are normal.

I next consider the implications of SOX. Before this act went into effect on August 29, 2002, firm insiders were required to report their option exercises during a calendar month only by the tenth day of the following month. This allowed ample time for backdating, so I expect stronger return patterns during the pre-SOX period. The Act cuts short the reporting period to two days, so I expect weaker return patterns during the post-SOX period. Notice a comparison of the pre-SOX and post-SOX return patterns also helps distinguish the backdating hypothesis from the private-information hypothesis or the good-timing hypothesis. If different types of option exercise are motivated by different types of information (positive for cash exercises and negative for cashless exercises), then the passage of SOX should be a non-event in my study.

Finally, SOX prohibits executive loans made by firms. I conjecture that to some extent the choice of an option exercise mechanism depends on the reporting delay and the availability of executive loans. I therefore expect to find a decrease in the frequency of cash exercises and stock exercises relative to cashless exercises during the post-SOX period.

III. Data and Methods

A. Sample selection

I obtain the sample of option exercises from the Thomson Financial's Insider Filing Database, which captures the insider transactions reported on SEC forms 3, 4, 5, and 144. Corresponding to the SEC filing format, this database is organized into two tables. Table 1 includes the stock transactions, and Table 2 includes the derivative transactions. I use the following procedure to identify option exercise transactions. First, since Table 2 reports the transactions of both stock options and non-option derivatives (such as warrants and convertible bonds), I require the derivative type to be options (CALL or OPTNS), non-qualified options (NONQ), employee options (EMPO), or director options (DIRO or DIREO). Next, I use the transaction codes M (Exercise of in-the-money or at-the-money derivative security acquired pursuant to Rule 16b-3 plan), X (Exercise of in-the-money or at-the-money derivative security), and C (Conversion of derivative security) to identify option exercise transactions. Finally, to maintain data

quality, I only keep records with cleanse codes R (Data verified through the cleansing process) and H (Cleansed with a very high level of confidence).⁷

An option exercise transaction is reported in Table 1 of SEC filings as an acquisition of the underlying stock and in Table 2 as a disposition of the option. To make sure I capture only option exercises but not other types of option disposition (such as forfeiture or cancellation), I match Table 2 transactions to Table 1 transactions, by transaction code, transaction date, number of shares, and transaction price. The transaction price is the stock acquisition price in Table 1 and the option exercise price in Table 2.

A CEO may exercise options from different grants on the same date, and Thomson Financial reports these exercises as different transactions. Since the incentive effects are likely to be the same for options exercised on the same day, I aggregate these into one exercise. The above procedure identifies 12,721 option exercises by firm CEOs between January 1997 and December 2005.

Next, I classify the option exercises into three categories as discussed before. First, in a stock exercise, the CEO pays the exercise price with previously-held stock of his firm. In this type of exercise, stock disposition with transaction code F (Payment of option exercise price or tax liability by delivering or withholding securities incident to exercise of a derivative security issued in accordance with Rule

⁷ Heron and Lie (2006a) also include observations with cleanse code C (A record added to non-derivative table or derivative table in order to correspond with a record on the opposing table). This code is appropriate for option grants since the grants only appear in the derivative table. However, as discussed below, an option exercise should appear in both tables and I match the records across the two tables to confirm an option exercise. Therefore, it is not appropriate to include observations with cleanse code C in option exercises.

16b-3) and option sale indicator A (All) or P (Partial) should be reported in Table 1.⁸ Second, in a cashless exercise, the CEO sells the stock in the open market or to a private party and delivers part of the proceeds to the firm to exercise the options. In this type of exercise, stock disposition with transaction code S (Open market or private sale of non-derivative or derivative security) and option sale indicator A (All) or P (Partial) should be reported. Third, in a cash exercise, no stock is sold to the firm or on the open market to facilitate option exercise. In this type of exercise, no stock disposition with transaction code F or S should be reported. I use these rules to classify the option exercises.⁹

Figure 1 shows the distribution of the number of shares corresponding to option exercises. There are many more small-size option exercises than option grants, the data for which are also obtained from the Thomson Financial's Insider Filing Database. Given the significantly smaller backdating incentives for exercises relative to grants as discussed in the introduction, it becomes necessary to use a size filter. I exclude roughly one-third of options exercises which involve less than 10,000 shares from my analysis, since the incentive to backdate the exercise of these options may be quite small (less than \$2,000 gain to

⁸ Sometimes a stock disposition with transaction code D (Disposition to the issuer of issuer equity securities pursuant to Rule 16b-3(e)) is reported in Table 1 on the option exercise day. The CEO may use the proceeds of this stock disposition to pay for the option exercise price. However, the terms of a stock disposition under Rule 16b-3(e) need to be approved in advance by the board of directors, a board committee composed solely of two or more outside directors, or the majority shareholders. Thus, stock dispositions with transaction code D are pre-arranged and are unlikely to provide the opportunity for backdating. In addition, transaction code D appears much less frequently than transaction code F. Therefore, I do not include these transactions in the stock exercise category.

⁹ I suspect some stock exercises may be misclassified as cashless exercises since the transaction code S includes private sales, which may be interpreted by some CEOs as including stock sales to the firm. Further, some CEOs report stock dispositions with transaction codes F and S on the same day, suggesting both stock and cashless exercises. It is likely that such transactions are related, so I classify them as cashless exercises, since at least some stock was sold on the open market or to a third party. This adds some noise to the data and works against finding the evidence.

the CEO for every \$1 manipulation of stock price). This criterion reduces the sample size from 12,721 to 8,478 exercises. I further exclude the option exercises that are within two weeks of the option vesting date, option expiration date, or the fiscal year-end of the firm, as they may be scheduled or subject to considerations such as window dressing before filing the proxy statement. Finally, I require the stock prices to be available from CRSP on the reported exercise date. My final sample consists of 6,905 exercises, of which 3,490 are during the pre-SOX period and 3,415 are during the post-SOX period.

Insert Figure 1 about here

Figure 2 shows the sample distribution by the year and the exercise mechanism. There are relatively few exercises during 2001-2002, when stock prices were low, while there is a corresponding surge during 2003-2005. Cashless exercise is the most frequently used mechanism, accounting for 63% of all exercises. Cash exercise and stock exercise account for the remaining 21% and 16%. Recall that cashless exercises are much less likely to be backdated than cash and stock exercises. I notice that there is a sharp increase in the frequency of cashless exercises, from 57% pre-SOX to 69% post-SOX, which is consistent with my prediction that the shorter filing requirements post-SOX have made it difficult to backdate option exercises. The associated χ^2 test statistic is significant at 1% level.

Insert Figure 2 about here

B. Summary statistics

Table 1 reports the summary statistics of the three mechanisms of option exercises during the pre-SOX and post-SOX periods. Since I exclude exercises of less than 10,000 shares, the option exercises in my sample are sizeable financial transactions. The average market value of shares acquired in the cash exercises equals \$1.79 million in the pre-SOX period and \$1.62 million in the post-SOX period. To illustrate the backdating incentive, assume a CEO backdates the option exercise to a 5% lower stock price. If the ordinary income tax rate is 20% higher than the capital gain tax rate, he can reduce his tax liability by $\$1,790,000 \times 0.05 \times 0.2 = \$17,900$. The average market value of shares acquired in stock

exercises equals \$5.93 million and \$5.08 million in the pre-SOX and post-SOX periods. Thus, even if the backdating incentive per dollar of stock price is lower for stock exercises, the aggregate incentive may be comparable. The average size of cashless exercises is between the cash exercises and stock exercises.

Insert Table 1 about here

The reporting lag is similar in all three types of option exercises. Prior to SOX, all three mechanisms have median reporting lag of 16 days. After SOX, the reporting lag becomes much smaller, so I look at the averages, which equal 2.94, 1.93, and 1.45 days for cash, stock, and cashless exercises. Thus, cashless exercises with less backdating possibilities are filed in a more timely fashion than cash and stock exercises. Based on reporting lags during pre-SOX and post-SOX periods, I examine cumulative abnormal stock returns and market returns over two windows: A short window of two days and a long window of 15 days before and after the reported exercise dates.

C. Computation of abnormal stock returns around option exercises

I calculate the abnormal stock returns by subtracting the market returns from the stock returns. The market return is measured by the CRSP value-weighted return including dividends (VWRETD). I do not use the market model or the Fama-French factor model to estimate the predicted stock returns since option exercises typically follow a period of high stock returns. Using stock returns prior to option exercise to estimate the predicted returns will introduce a downward bias in abnormal stock returns. This bias makes the return patterns of cash exercises appear to be stronger than the actually are and the return pattern of stock exercises appear to be weaker than they are.

IV. Empirical results

A. Abnormal stock returns during the pre-SOX period

Column (a) of Table 2 shows the abnormal stock returns around cash exercises in the pre-SOX period. Over a one-year period ending on TD-15 (where TD refers to the transaction date of option exercise), the average abnormal return equals 18.35%, significant at the 1% level. This verifies that option exercises follow high stock returns. In contrast with this long-time trend, the abnormal returns become

negative immediately before option exercise, with average values of -0.88% over the short window spanning [TD-1, TD] and -1.97% over the long window spanning [TD-14, TD], both significant at the 1% level. Then, immediately after exercise, the abnormal returns turn to positive, with average values of 2.26% and 5.13% over the short window spanning [TD+1, TD+2] and the long window spanning [TD+1, TD+15], both significant at the 1% level. The differences between the pre- and post-exercise abnormal returns are also significant at the 1% level. Consistent with the backdating hypothesis, these results suggest that, on average, cash exercises occur at lower prices relative to those prevailing at the beginning and the end of the windows bracketing the exercise date.

Insert Table 2 about here

Column (b) shows the abnormal stock returns around stock exercises during the pre-SOX period. Similar to cash exercises, there is a significant price run-up in the one-year period ending on TD-15. However, opposite to the return pattern of cash exercises, the abnormal stock return continues to be positive during the 15-day period immediately before the reported exercise date, with average values of 1.06% and 4.31% over the short and the long windows, both significant at 1% level. Immediately after exercise, the abnormal stock return for stock exercises becomes negative, with average values of -0.09% and -0.65% over the two windows, significant at 5% level in the second case. The differences between the pre- and post-exercise abnormal returns are also significant at 1% level. Consistent with the backdating hypothesis, these results again suggest that, on average, stock exercises occur at higher prices relative to those prevailing at the beginning and the end of the bracketing windows.

Column (c) shows the abnormal stock returns around cashless exercises in the pre-SOX period. In contrast to the cash and stock exercises, the abnormal stock returns around cashless exercises remain significantly positive in all windows. Consistent with option valuation and exercise models, the pre-exercise long-window return is a large 6.50% while the post-exercise long-window return is a much smaller 0.58%. More importantly, on average, cashless exercises do not occur at higher or lower prices relative to those prevailing at the beginning and the end of the bracketing windows.

Since backdating is far more difficult with cashless exercises, I next compare the abnormal stock returns of cash exercises and stock exercises to cashless exercises. Column (a) – (c) shows the contrast between cash exercises and cashless exercises. During the 15 days ending on TD, the average abnormal return of cash exercises is significantly lower than that of cashless exercise in every window examined. In the 15 days beginning on TD+1, the pattern is the opposite, and significant over four out of six windows. Both the pre- and post-exercise returns in this column support the backdating hypothesis. Next, column (b) – (c) shows that the average abnormal stock returns of stock exercises are lower than that of cashless exercises in both long windows. The post-exercise returns in this column support the backdating hypothesis.

The left panel of Figure 3 provides a visual contrast of the cumulative abnormal stock returns around the three types of option exercises in the pre-SOX period. The cash exercises have a “V” shape return pattern and the exercise date is at the bottom of the “V”. The stock price starts to decline about two weeks before the reported exercise date, and the decline accelerates on the last day before exercise. The stock price rebounds about 2% on the next day after exercise, and then continues to climb for the next two weeks. The stock exercises have an inverse “V” return pattern and the exercise date is at the top of the inverse “V”. The pattern is almost symmetric to that of the cash exercises. The return pattern of the cashless exercises is similar to the return patterns documented in previous studies (see Figure 3 of Carpenter and Remmers (2001)). I conclude that, in cases where the exercise date can be manipulated to coincide with the best stock price for the CEO, on average, the exercise date coincides with the best stock price.

Insert Figure 3 about here

B. Abnormal stock returns during the post-SOX period

The backdating hypothesis predicts that the return patterns may be similar to those documented above but should be less significant during the post-SOX period with the requirement of a two-day filing period. This contrasts with the predictions of the alternate private-information or good-timing hypotheses

that the length of filing period is a non-issue. The last seven columns in Table 2 test these predictions. In a nutshell, the evidence supports the backdating hypothesis.

While the table provides many contrasts, I summarize here the more important ones. Column (d) shows that the pre- and post-exercise returns over short windows equal -0.50% and 0.94% for cash exercises during the post-SOX period, significant in both cases, and compared to -0.88% and 2.26% during the pre-SOX period. The long window returns equal 0.47% and 2.55%, significant in the second case, and compared to -1.97% and 5.13% during the pre-SOX period. Column (a) – (d) shows that the difference between the pre-SOX and post-SOX abnormal stock return is in the direction predicted by the backdating hypothesis in all four cases, and significant at 1% level in three cases.

Column (e) shows the abnormal stock returns around stock exercises in the post-SOX period. I still find positive pre-exercise abnormal returns and negative post-exercise abnormal returns, which suggests that backdating in stock exercises also does not completely disappear after SOX. However, the negative post-exercise abnormal return is statistically significant only over the short window [TD+1, TD+2] and not over the long window [TD+1, TD+15]. This suggests that SOX limits backdating to a shorter period. Column (b) – (e) shows that the return patterns around stock exercises do not differ significantly between the pre-SOX and post-SOX periods. This may be attributed to the generally lower incentive effects in stock exercises compared to cash exercises. Next, Column (f) shows the abnormal stock returns around cashless exercises in the post-SOX period. The pre-exercise abnormal returns remain significantly positive, but the post-exercise abnormal returns become marginally negative.

The right panel of Figure 3 graphically depicts the post-SOX abnormal stock return patterns around the three mechanisms of exercises. The exercise date is still at a low stock price for cash exercises and a high stock price for stock exercises. However, the “valley” or the “hill” in stock returns becomes flatter in magnitude and narrower in time than during the pre-SOX period. The combined evidence suggests that SOX reduces backdating in option exercises, yet some backdating activity remains.

C. Market returns around option exercises

To further differentiate the backdating hypothesis from the good timing hypothesis, I examine the market returns around option exercises. Following Lie (2005), I argue that the CEOs are unlikely to possess private information about the future market returns. Therefore, the good timing hypothesis predicts no market return patterns around option exercises. However, if the CEO backdates the option exercises to a more advantageous stock price, then the market return will show patterns similar to the stock returns. That is because in backdating to the more advantageous stock price the CEO may not differentiate between whether it is caused by stock-specific or market-wide factors.

Figure 4 shows the cumulative market returns around the three types of option exercises. In the pre-SOX period, the market clearly shows a dip around the date of cash exercises. Although the market return has an overall upward trend for cash exercises, it starts to decline three days before the reported exercise date and reaches the bottom on TD-1. After the reported exercise date, the market quickly rebounds back to the upward trend within two days. In contrast, the stock exercises occur when the market reaches the peak of a period, although the post-exercise decline is less obvious. In the post-SOX period, the cumulative market return shows no obvious patterns around the reported exercise dates, except a small dip for cash exercises.

Insert Figure 4 about here

To examine the statistical significance of the market return patterns, I calculate the abnormal market return by subtracting the expected market return from the raw market returns. The expected market return is measured as the cumulative market return over the entire pre- or post-SOX period adjusted for the number of trading days in a return window.

Column (a) of Table 3 shows the abnormal market returns around cash exercises during the pre-SOX period. The average pre-exercise abnormal market returns equal -0.01% and -0.11% over the windows [TD-1, TD] and [TD-14, TD]. While insignificant, both are negative, and contrast with positive and usually significant abnormal market returns for stock and cashless exercises over the corresponding windows. The average post-exercise returns equal 0.34% and 0.82% over the windows [TD+1, TD+2]

and [TD+1, TD+15], both significant at the 1% level. Compared to the cashless exercises shown in column (c), the cash exercises have significantly lower pre-exercise abnormal market returns and significantly higher post-exercise abnormal market returns. These results support the backdating hypothesis.

Insert Table 3 about here

Column (b) of Table 3 shows the abnormal market returns around stock exercises in the pre-SOX period. The average pre-exercise abnormal market returns equal 0.08% and 0.89% over the windows [TD-1, TD] and [TD-14, TD], significant at the 1% level in the second case. The average post-exercise returns equal -0.08% and -0.33% over the windows [TD+1, TD+2] and [TD+1, TD+15], significant at the 10% level in the second case. However, the abnormal market returns around stock exercises are not significantly different from cashless exercises in all but one case. These results provide some support to the backdating hypothesis.

During the post-SOX period the evidence based on abnormal market returns tends to become largely insignificant. This is not surprising. Abnormal market returns are expected to show weaker patterns than abnormal stock returns, which in turn are weaker during the post-SOX period than the pre-SOX period. Alternatively, the limited opportunities to backdate option exercises during the post-SOX period may be largely based on abnormal stock returns.

D. Abnormal stock returns around option exercise by reporting delay during the post-SOX period

The cumulative evidence from Tables 2 and 3 and Figures 3 and 4 thus far suggests that, consistent with backdating of option exercises, all return patterns become less significant during the post-SOX period. Following Heron and Lie (2006a), I now examine whether the weakening within the post-SOX period further shows up in a comparison of return patterns between subsets formed by whether the SEC report was filed by TD+1, on TD+2, or on TD+3 and later. Table 4 and Figure 5 present the evidence for cash exercises and stock exercises.

Insert Table 4 about here

Insert Figure 5 about here

Table 4 shows that the sample sizes become quite small, given the decreased frequency of these exercise mechanisms during the post-SOX period to begin with. However, I still find that for stock exercises the post-exercise stock return is more negative for longer reporting delays. Setting aside the question of statistical significance, the right panel of Figure 5 does show that a higher reporting delay for stock exercises is related to the height of the “hill”, thus supporting the backdating hypothesis. In contrast, the relation between stock returns and reporting delay during the post-SOX period is less obvious for cash exercises.

E. Abnormal stock returns around option exercises by the number of shares in exercise

I exclude option exercises with less than 10,000 shares from my sample based on the argument that such exercises do not provide sufficient incentive for backdating. Based on this argument, I should expect that still larger option exercises offer bigger incentives and show more pronounced return patterns. To test this prediction, I divide my sample by whether an option exercise involves 10,000 to 99,999 shares, or 100,000 or more shares.

Figure 6 shows the results for cash exercises and stock exercises during the pre-SOX period. The left panel shows that for cash exercises of 100,000 shares or more, there is an average abnormal stock price drop of about 5% over the two and a half weeks before the reported exercise date and a rebound of more than 5% within a week after the reported exercise date. In contrast, for cash exercises of between 10,000 and 99,999 shares, the average drop is about 1% and the rebound is about 3%. This evidence further supports the backdating hypothesis.

Insert Figure 6 about here

The right panel of Figure 6 shows that for stock exercises, the return patterns do not differ significantly between the large and very large exercises. The large exercises actually have higher average

pre-exercise abnormal stock returns. It is possible that this result is related to risk-aversion, since CEOs who hold very large positions may exercise earlier than those who hold just large positions. I do notice that the two-day post-exercise price drop is greater for the very large exercises, which may be related to backdating.

F. Estimating the fraction of manipulated option exercises

Heron and Lie (2006b) and Bebchuk et al. (2006a, b) also examine the stock price ranking on the reported option grant dates relative to the rest of the month. They find that the options are more likely to be granted at the lowest stock price of the month than by random chance. They further estimate the fraction of manipulated (including backdated) option grants as the realized fraction of options granted at the lowest stock price minus the expected fraction of options granted at the lowest price if the grant date is randomly selected. It is reasonable to assume that in absence of price or date manipulation the option grant date is uncorrelated with stock price. However, this assumption does not apply to option exercises since many option valuation models have shown that executives are more likely to exercise their options when the stock price is higher.¹⁰ Thus, a higher-than-random fraction of options are exercised at the highest stock price of a month even if the date or price is not manipulated.

To estimate the fraction of manipulated option exercises, I use the fraction of cashless exercises at the highest or the lowest stock price of the month as the benchmark of no manipulation. I have shown above that cashless exercises are much more difficult to backdate and I find little evidence of backdating for this type of exercise.¹¹ Figure 7 plots the number of option exercises by the three mechanisms during the pre- and post- SOX periods. Prior to SOX, the fraction of cashless exercises at the highest price of the

¹⁰ See for example Hall and Murphy (2002) and Cai and Vijh (2005).

¹¹ Even if very few cashless exercises might be backdated, some CEOs may manipulate the stock price around option exercises through news release (known as spring-loading or bullet dodging). If this is the case, the “normal” fraction of option exercised at the highest price may be overstated, while the fraction at the lowest price may be understated. Therefore, the estimated fraction of manipulated stock exercises may be understated and the estimated fraction of manipulated cash exercise may be overstated.

month equals 7.8%, and equals 2.6% at the lowest price. In contrast, in the same period 12.6% of the stock exercises are at the highest price of the month and 15.0% of the cash exercises are at the lowest price of the month. Thus, I estimate that during the pre-SOX period 4.8% of the stock exercises and 12.4% of the cash exercises were backdated or manipulated. After SOX became effective on August 29, 2002, the estimated fraction of backdated or manipulated option exercises drop to 1.8% for stock exercises and 2.8% for cash exercises.

Insert Figure 7 about here

V. Conclusion

Recent studies suggest that the grant dates of many executive stock options may be determined retroactively. More than a hundred firms have been under investigation for backdating option grants by the SEC. A natural question therefore arises as to whether the exercises of executive stock options may also be backdated. Prior academic studies find little conclusive evidence, so I re-examine this issue in this study.

Using a large sample of options exercised by the CEOs of U.S. firms during 1997-2005, I identify three mechanisms of exercise: cash exercise, stock exercise, and cashless exercise. I show that the backdating incentives are quite different across these three mechanisms. A cash exercise offers the CEO an incentive to exercise at a lower stock price, while a stock exercise offers him the incentive to exercise at a higher stock price. A cashless exercise is unlikely to be backdated since an open market transaction or a third party outside the firm is involved. Thus, it becomes important to separate the three mechanisms when examining the stock price patterns around option exercises.

I find that for cash exercises the average abnormal stock return is significantly negative before the reported exercise date but significantly positive afterwards. Thus, the stock price exhibits a “V” shape pattern, with the reported exercise date at the bottom. For stock exercises, the abnormal return pattern is the opposite – an inverse “V” shape pattern, with the reported exercise date at the top. This suggests that

the timing of option exercises may be manipulated. In comparison, the return pattern around cashless exercises is consistent with the predictions of option valuation models.

I also find that the market return around these option exercises follows a similar but weaker pattern. Further, I find that the return patterns diminish after SOX shortens the reporting period. Both pieces of evidence are consistent with the backdating hypothesis, but not the good-timing hypothesis. In addition, the abnormal return patterns are significantly stronger for larger cash exercises. Finally, I estimate 12.4% of the cash exercises and 4.8% of the stock exercises during the pre-SOX period were backdated or otherwise manipulated.

From a regulatory perspective, my evidence suggests that an open-market cashless exercise may be the preferred mechanism for executive stock options since it does not accommodate the incentives to manipulate the timing of exercises. I also find that SOX has been effective in reducing the backdating of option exercises, particularly for the exercises reported timely. As an implication of this study, it may be desirable for SEC to tighten the reporting requirement of option grants and exercises to same-day filing, and with stricter enforcement.

Finally, I would like to emphasize that my results are based on the average return patterns within a large sample of option exercises by firm CEOs. I do not intend to imply that all, or even the majority, of CEOs indulge in this illegal practice of backdating their option exercises. Only a subset of CEOs are likely to have indulged in this practice. At the same time, the extent of manipulation by this subset of CEOs should be higher than that documented for the aggregate sample in this study.

References

- Aboody, D., Kasznik R., 2000. CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics* 29, 73-100.
- Baker, A., 2006. *The stock option book*, 7th Edition. National Center for Employee Ownership, Oakland, California.
- Bebchuk, L., Grinstein, Y., Peyer, U., 2006. Lucky CEOs. Harvard Law School working paper.
- Bebchuk, L., Grinstein, Y., Peyer, U., 2006. Lucky Directors. Harvard Law School working paper.
- Bizjak, J., Lemmon, M., Whitby, R., 2006. Option Backdating and board interlocks. Portland State University and University of Utah working paper.
- Cai, J., Vijh, A., 2005. Executive stock and option valuation in a two state-variable framework. *The Journal of Derivatives* 12, 9-27.
- Carpenter, J., Remmers, B., 2001. Executive stock option exercises and inside information. *Journal of Business* 74, 513-534.
- Cicero, D., 2007. Timing and backdating of executive stock option exercises – before and after the Sarbanes-Oxley Act. University of Georgia working paper.
- Collins, D., Gong, G., Li, H., 2005a. The timing of CEO stock option grants: scheduled versus unscheduled awards. University of Iowa and Pennsylvania State University working paper.
- Collins, D., Gong, G., Li, H., 2005b. The effect of the Sarbanes-Oxley Act on the timing manipulation of CEO stock option awards. University of Iowa and Pennsylvania State University working paper.
- Dhaliwal, D., Erickson, M., Heitzman S., 2007. Taxes and the backdating of stock option exercise dates. University of Arizona, University of Chicago, and University of Rochester working paper.
- Hall, B., Murphy, K., 2002. Stock options for undiversified executives. *Journal of Accounting and Economics* 33, 3-42.
- Heron, R., Lie, E., 2006a. Does backdating explain the stock price pattern around executive stock option grants? *Journal of Financial Economics*, forthcoming.
- Heron, R. and Lie, E., 2006b, What fraction of grants to top executives have been backdated or manipulated?, Indiana University and University of Iowa working paper.
- Kahle, K., Shastri, K., 2004. Executive loans. *Journal of Financial and Quantitative Analysis* 39, 791-811.
- Lie, E., 2005. On the timing of CEO stock option awards. *Management Science* 51, 802-812.
- Murphy, K., 2003. Stock-based pay in new economy firms. *Journal of Accounting and Economics* 34, 129-147.
- Narayanan, M. P., Seyhun, N., 2005. Do managers influence their pay? Evidence from stock price reversals around executive stock option grants, working paper. University of Michigan.
- Yermack, D., 1997. Good timing: CEO stock option awards and company new announcements. *Journal of Finance* 52, 449-476.

Table 1**Summary statistics**

I obtain my sample of CEO option exercises from the Thomson Financial's Insider Filing Database using the following criteria: 1. The derivative type is OPTNS, CALL, NONQ, EMPO, DIRO, or DIREO. 2. The transaction code is M, X, or C. 3. The cleanse code is R or H. 4. There is a matching stock acquisition record in the stock transaction table. 5. The first (highest rank) role code is CEO. 6. I aggregate options from different grants that are exercised on the same date into one exercise, and exclude exercises with less than 10,000 shares that presumably provide less backdating incentive. 7. I exclude exercises that occur within two weeks of the option vesting date, expiration date, or fiscal year-end of the firm, which may have been scheduled ahead of time. 8. The stock return data around exercise date is available from CRSP. I next classify all option exercises in my sample into one of three categories using the following procedure. First, if on the option exercise date there is an option exercise related stock disposition record with transaction code F, then I classify it as a stock exercise. Second, if on the option exercise date there is an option exercise related stock sale record with transaction code S, then I classify it as a cashless exercise. Third, if it is neither a stock exercise nor a cashless exercise, then I classify it as a cash exercise. Market value of shares equals the number of shares in an option exercise times the stock price on the exercise date. Reporting lag equals the number of trading days between the option exercise date and the SEC filing date. SOX is an acronym for the Sarbanes-Oxley Act. A SOX amendment to the SEC Rule 16a that governs the reporting of ownership and trading by corporate insiders went into effect on August 29, 2002.

Variables	Cash Exercise			Stock Exercise			Cashless Exercise		
	N	Mean	Median	N	Mean	Median	N	Mean	Median
<i>Panel A: Pre-SOX (1/1/1997 – 8/28/2002)</i>									
Number of Shares	869	75,740	30,000	649	130,092	40,500	1,972	61,679	30,000
Market value of shares (\$,000)	869	1,788	619	649	5,927	1,669	1,972	2,720	1,215
Reporting lag (in trading day)	869	19.54	16.00	649	19.12	16.00	1,972	10.64	16.00
<i>Panel B: Post-SOX (8/29/2002 – 12/31/2005)</i>									
Number of Shares	575	80,943	31,009	478	131,983	60,000	2,362	63,559	32,000
Market value of shares (\$,000)	575	1,616	595	478	5,076	1,798	2,362	2,305	1,075
Reporting lag(in trading day)	575	2.94	1.00	478	1.93	2.00	2,362	1.45	1.00

Table 2

Mean abnormal stock returns around reported option exercise dates

The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises are described in Table 1. The abnormal stock return equals the cumulative stock return over a window minus the cumulative market return. The market return is measured by the CRSP value-weighted return including dividends (VWRETD). All returns are expressed in percent form. TD denotes the reported transaction date of option exercise. The number of observations is as of TD. Statistical significance is determined by t-statistics. The notations ^{***}, ^{**}, and ^{*} denote statistical significant at the 1%, 5%, and 10% levels.

Stock Return Windows	Pre-SOX (1/1/1997 – 8/28/2002)					Post-SOX (8/29/2002 – 12/31/2005)					Differences (Pre-SOX - Post-SOX)	
	Cash Exercise	Stock Exercise	Cashless Exercise	Difference		Cash Exercise	Stock Exercise	Cashless Exercise	Difference		Cash Exercise	Stock Exercise
	(a)	(b)	(c)	(a) – (c)	(b) – (c)	(d)	(e)	(f)	(d) – (f)	(e) – (f)	(a) – (d)	(b) – (e)
[-266, -15]	18.35 ^{***}	18.19 ^{***}	61.82 ^{***}	-43.47 ^{***}	-43.63 ^{***}	39.84 ^{***}	18.12 ^{***}	36.91 ^{***}	2.93	-18.79 ^{***}	-21.49 ^{**}	0.07
[-14, -5]	-1.29 ^{***}	2.03 ^{***}	3.77 ^{***}	-5.06 ^{***}	-1.74 ^{***}	0.96 ^{**}	1.79 ^{***}	1.88 ^{***}	-0.92 ^{**}	-0.08	-2.25 ^{***}	0.24
-4	-0.07	0.24 [*]	0.49 ^{***}	-0.56 ^{***}	-0.25 [*]	0.21	0.34 ^{***}	0.29 ^{***}	-0.08	0.05	-0.28	-0.10
-3	0.01	0.38 ^{***}	0.56 ^{***}	-0.55 ^{***}	-0.18	-0.17	0.46 ^{***}	0.31 ^{***}	-0.47 ^{***}	0.15	0.18	-0.08
-2	-0.32	0.45 ^{***}	0.50 ^{***}	-0.82 ^{***}	-0.05	-0.09	0.50 ^{***}	0.35 ^{***}	-0.44 ^{***}	0.14	-0.23	-0.04
-1	-0.26	0.85 ^{***}	0.66 ^{***}	-0.91 ^{***}	0.19	-0.32 ^{**}	0.52 ^{***}	0.30 ^{***}	-0.62 ^{***}	0.22 ^{**}	0.06	0.32 ^{**}
TD	-0.63 ^{***}	0.21 ^{**}	0.43 ^{***}	-1.06 ^{***}	-0.22 [*]	-0.19	0.24 ^{***}	0.19 ^{***}	-0.38 ^{**}	0.05	-0.44 [*]	-0.03
1	1.67 ^{***}	-0.22 ^{**}	0.16 ^{**}	1.50 ^{***}	-0.38 ^{***}	0.59 ^{***}	-0.26 ^{***}	-0.05	0.64 ^{***}	-0.21 ^{**}	1.07 ^{***}	0.04
2	0.59 ^{***}	0.13	0.05	0.54 ^{***}	0.07	0.31 [*]	0.04	-0.06	0.37 ^{**}	0.10	0.28	0.09
3	0.24	-0.23 ^{**}	0.01	0.23	-0.25 ^{**}	0.02	0.07	-0.02	0.05	0.10	0.22	-0.31 ^{**}
4	0.40 [*]	0.03	0.16 ^{**}	0.24	-0.13	0.10	-0.14	-0.03	0.13	-0.10	0.30	0.16
5	0.48 ^{***}	-0.11	0.06	0.42 ^{**}	-0.17	0.11	-0.19 ^{**}	-0.02	0.13	-0.17 [*]	0.37 [*]	0.08
[6, 15]	1.39 ^{***}	-0.24	0.21	1.18 ^{**}	-0.45	1.25 ^{***}	0.05	-0.12	1.36 ^{***}	0.16	0.14	-0.28
[16, 267]	1.98	-1.82	3.70 ^{**}	-1.72	-5.51 ^{***}	6.90 ^{**}	2.76 ^{**}	3.03 ^{***}	3.88	-0.26	-4.92	-4.58 ^{**}
[-1, TD] (1)	-0.88 ^{***}	1.06 ^{***}	1.09 ^{***}	-1.97 ^{***}	-0.03	-0.50 ^{**}	0.76 ^{***}	0.50 ^{***}	-1.00 ^{***}	0.27 [*]	-0.37	0.29
[1, 2] (2)	2.26 ^{***}	-0.09	0.21 ^{**}	2.05 ^{***}	-0.30 [*]	0.94 ^{***}	-0.23 ^{**}	-0.10 [*]	1.04 ^{***}	-0.12	1.32 ^{***}	0.14
(1) – (2)	-3.14 ^{***}	1.14 ^{***}	0.88 ^{***}			-1.44 ^{***}	0.99 ^{***}	0.60 ^{***}				
[-14, TD] (3)	-1.97 ^{**}	4.31 ^{***}	6.50 ^{***}	-8.47 ^{***}	-2.19 ^{***}	0.47	3.98 ^{***}	3.39 ^{***}	-2.91 ^{***}	0.60	-2.44 ^{***}	0.33
[1, 15] (4)	5.13 ^{***}	-0.65 ^{**}	0.58 ^{**}	4.55 ^{***}	-1.23 ^{***}	2.55 ^{***}	-0.41	-0.30 [*]	2.86 ^{***}	-0.11	2.58 ^{***}	-0.24
(3) – (4)	-7.10 ^{***}	4.96 ^{***}	5.92 ^{***}			-2.08 ^{**}	4.39 ^{***}	3.69 ^{***}				
N	869	649	1,972			575	478	2,362				

Table 3

Mean abnormal market returns around reported option exercise dates

The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises are described in Table 1. The market return is measured by the CRSP value-weighted return including dividends (VWRETDD). The abnormal market return equals the realized cumulative market return minus the expected market return. The expected market return is measured as the cumulative market return over the entire pre-SOX or post-SOX period adjusted for the number of trading days in a window. All returns are expressed in percent form. TD denotes the reported transaction date of option exercise. The number of observations is as of TD. Statistical significance is determined by t-statistics. The notations ***, **, and * denote statistical significant at the 1%, 5%, and 10% levels.

Market Return Windows	Pre-SOX (1/1/1997 – 8/28/2002)					Post-SOX (8/29/2002 – 12/31/2005)					Differences (Pre-SOX - Post-SOX)	
	Cash Exercise	Stock Exercise	Cashless Exercise	Difference		Cash Exercise	Stock Exercise	Cashless Exercise	Difference		Cash Exercise	Stock Exercise
	(a)	(b)	(c)	(a) – (c)	(b) – (c)	(d)	(e)	(f)	(d) – (f)	(e) – (f)	(a) – (d)	(b) – (e)
[-1, TD] (1)	-0.11	0.08	0.31***	-0.42***	-0.24***	0.03	0.16***	0.21***	-0.18***	-0.05	-0.14	-0.09
[1, 2] (2)	0.34***	-0.08	-0.07*	0.41***	-0.01	0.07	-0.04	0.00	0.07	-0.04	0.26***	-0.04
Difference (1) – (2)	-0.44***	0.16	0.39***			-0.04	0.20***	0.21***				
[-14, TD] (3)	-0.01	0.89***	0.57***	-0.58***	0.32	0.13	0.65***	0.57***	-0.44***	0.08	-0.14	0.24
[1, 15] (4)	0.82***	-0.33*	-0.25**	1.07***	-0.09	0.13	-0.19	0.03	0.10	-0.22*	0.69***	-0.15
Difference (3) – (4)	-0.83***	1.23***	0.81***			-0.01	0.84***	0.54***				
N	869	649	1,972			575	478	2,362				

Table 4**Mean abnormal stock returns around reported option exercise dates as a function of reporting delay**

The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises are described in Table 1. The abnormal stock return equals the cumulative stock return over a window minus the cumulative market return. The market return is measured by the CRSP value-weighted return including dividends (VWRETDM). All returns are expressed in percent form. TD denotes the reported transaction date of option exercise. I classify the option exercises in the post-SOX period by whether they are filed with SEC within one trading day of TD, on the second trading day after TD, or on the third day after TD and later. The number of observations is as of TD. Statistical significance is determined by t-statistics. The notations ^{***}, ^{**}, and ^{*} denote statistical significant at the 1%, 5%, and 10% levels.

Stock Return Windows	Filed by	Filed on	Filed on or	Differences	
	TD+1	TD+2	after TD+3	(b) – (a)	(c) – (a)
	(a)	(b)	(c)		
<i>Panel A: Cash Exercises</i>					
[-14, TD]	0.97	0.08	-0.60	-0.88	-1.56
[-1, TD]	-0.59 ^{**}	-0.31	-0.99	0.29	-0.39
[1, 2]	0.66 ^{***}	1.51 ^{**}	-0.32	0.85	-0.99
[1, 15]	1.08	4.37 ^{***}	2.33	3.29 ^{**}	1.25
N	289	240	46		
<i>Panel B: Stock Exercises</i>					
[-14, TD]	3.67 ^{***}	4.10 ^{***}	6.10 [*]	0.43	2.44
[-1, TD]	0.69 ^{***}	0.87 ^{***}	-0.44	0.18	-1.13 ^{**}
[1, 2]	-0.05	-0.29 ^{**}	-1.55	-0.24	-1.50
[1, 15]	0.19	-0.61 [*]	-4.87 ^{**}	-0.80	-5.06 ^{**}
N	190	275	13		

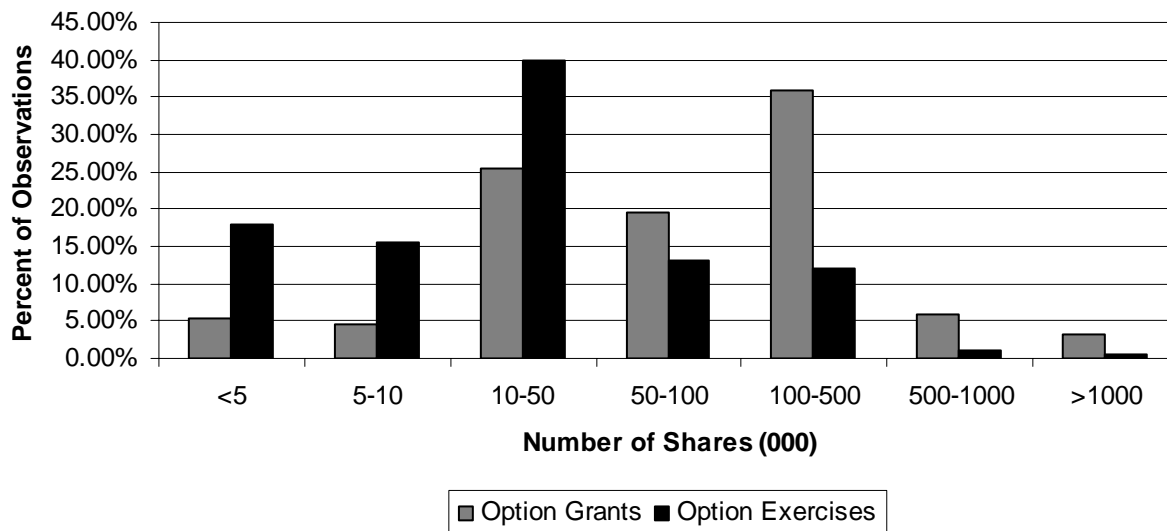


Figure 1. Frequency distribution of the number of shares underlying option grants and option exercises. This figure includes all option grants to and option exercises by firm CEOs in the Thomson Financial's Insider Filing database between January 1, 1997, and December 31, 2005. I aggregate options granted or exercised on the same date into one grant or exercise.

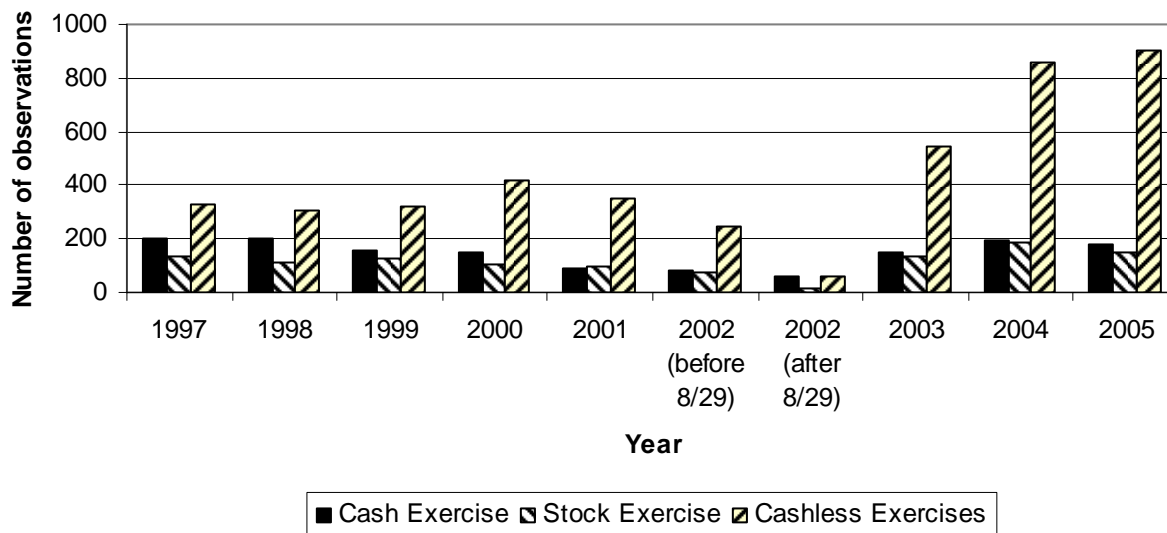


Figure 2. Sample distribution over time. The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises are described in Table 1.

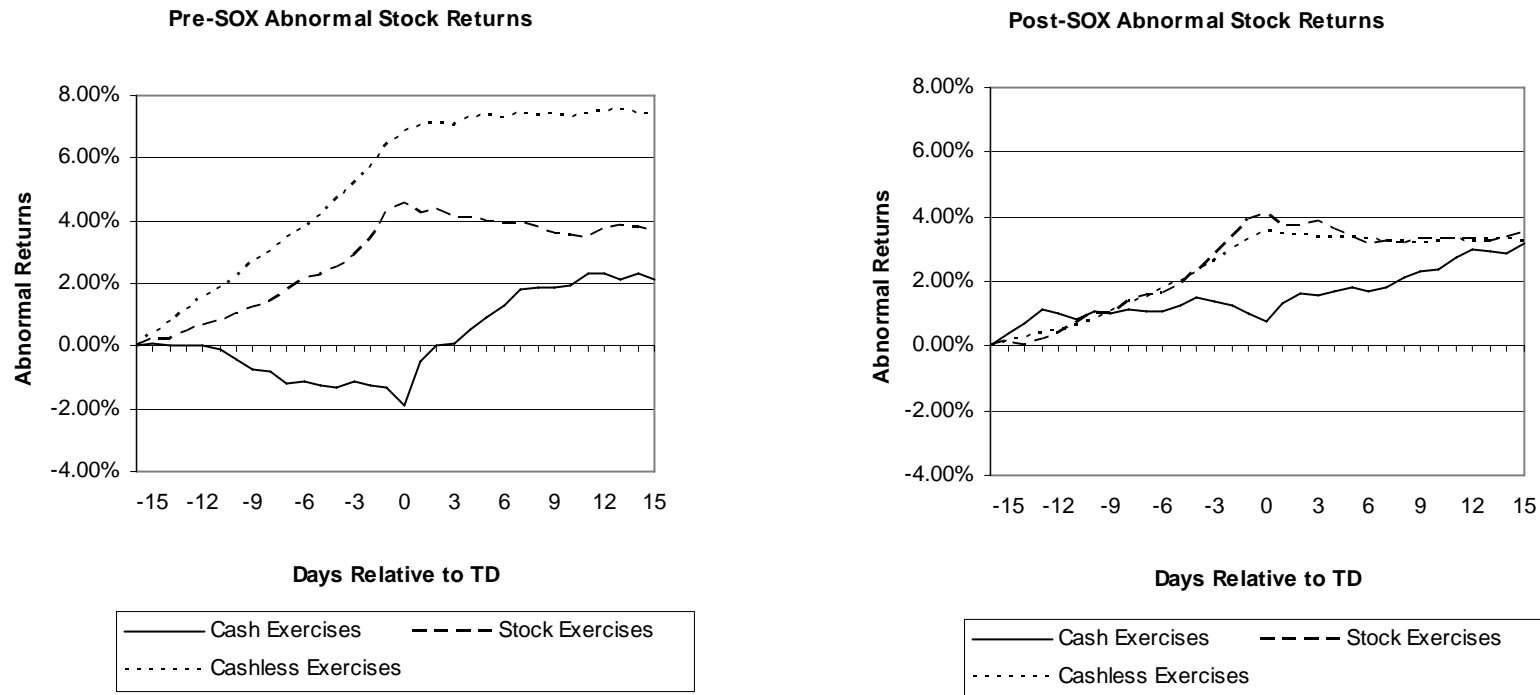


Figure 3. Mean abnormal stock returns around reported option exercise dates. The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises are described in Table 1. The pre-SOX period is between January 1, 1997, and August 28, 2002, and the post-SOX period is between August 29, 2002, and December 31, 2005. The abnormal stock return equals the cumulative stock return over a window starting on TD-15 minus the cumulative market return. The market return is measured by the CRSP value-weighted return including dividends (VWRETD). All returns are expressed in percent form. TD denotes the reported transaction date of option exercise.

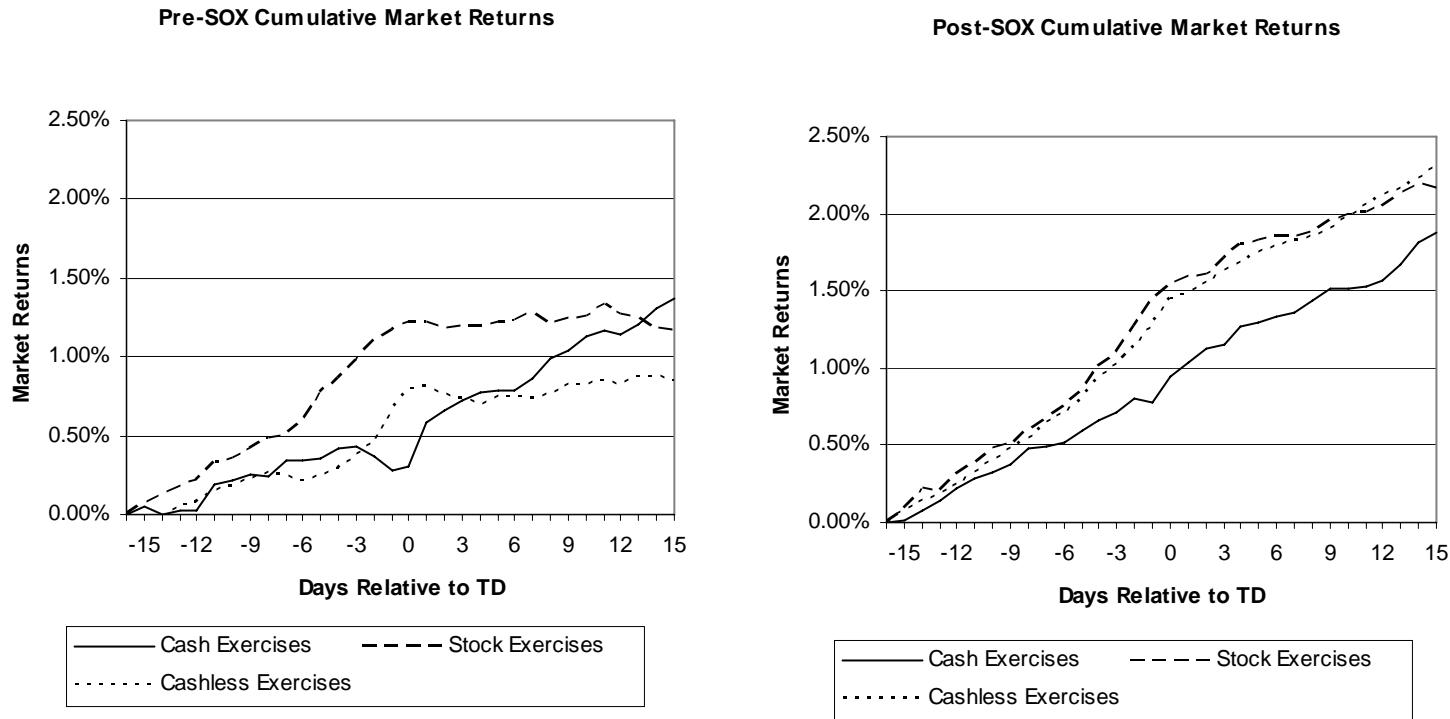


Figure 4. Mean cumulative market returns around reported option exercise dates. The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises are described in Table 1. The pre-SOX period is between January 1, 1997, and August 28, 2002, and the post-SOX period is between August 29, 2002, and December 31, 2005. The market return is measured by the CRSP value-weighted return including dividends (VWRETD). All returns are expressed in percent form. TD denotes the reported transaction date of option exercise.

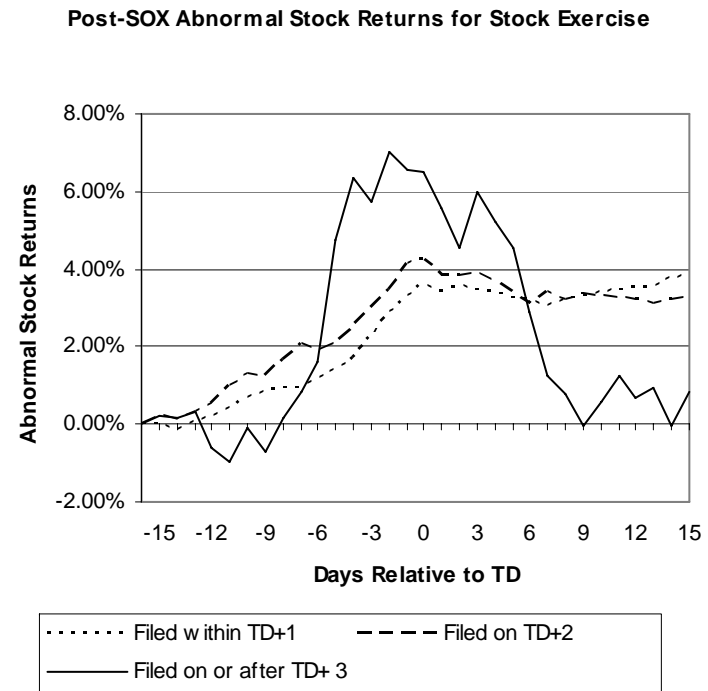
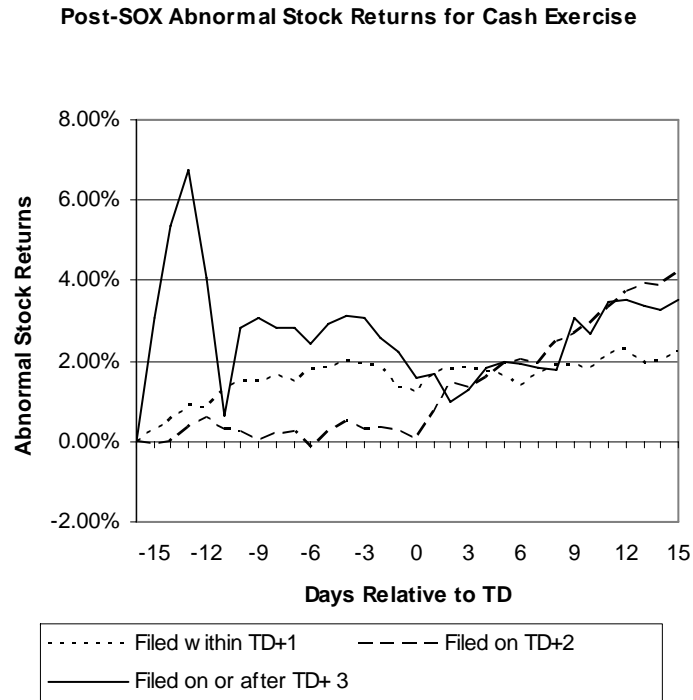


Figure 5. Mean abnormal stock returns around reported option exercise dates as a function of reporting delay. The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises are described in Table 1. The post-SOX period is between August 29, 2002, and December 31, 2005. The abnormal stock return equals the cumulative stock return over a window starting on TD-15 minus the cumulative market return. The market return is measured by the CRSP value-weighted return including dividends (VWRETD). All returns are expressed in percent form. TD denotes the reported transaction date of option exercise. I classify the option exercises in the post-SOX period by whether they are filed with SEC within one trading day of TD, on the second trading day after TD, or on the third day after TD and later.

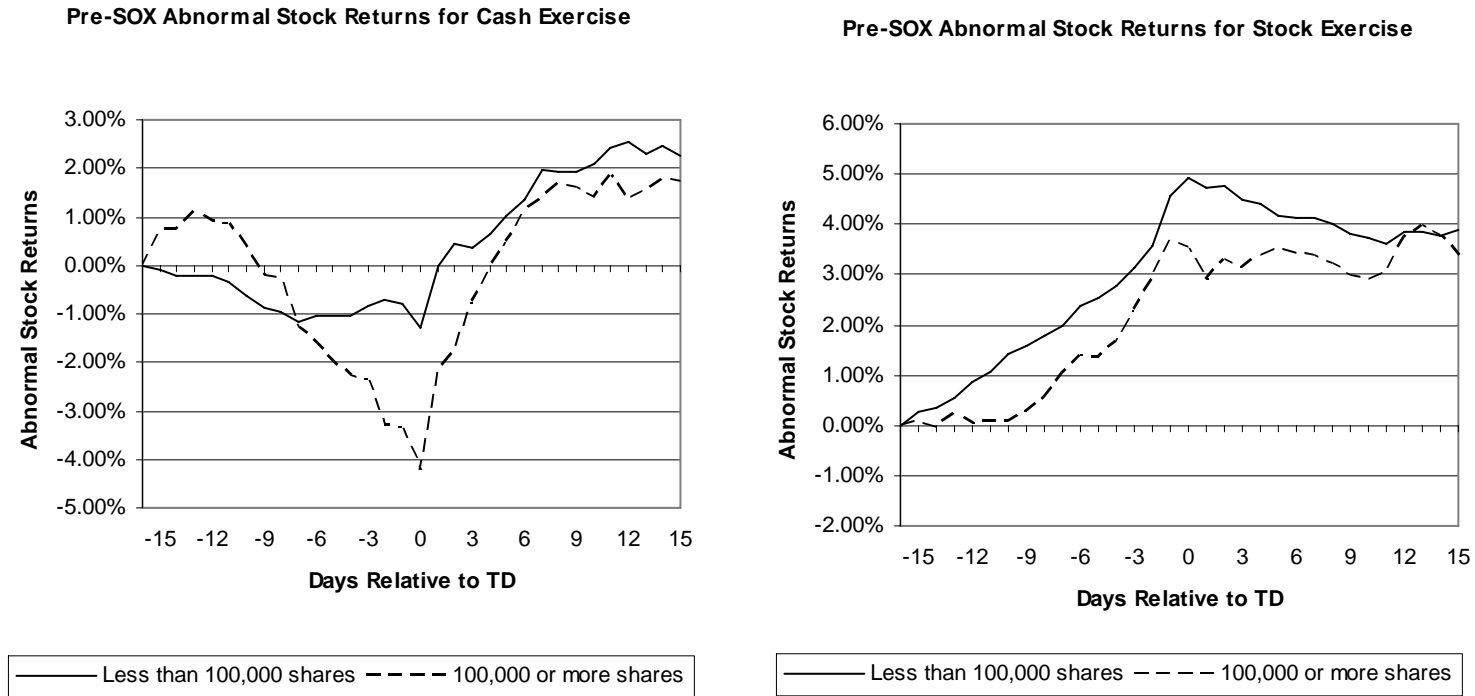


Figure 6. Mean abnormal stock returns around reported option exercise dates based on the number of shares in an exercise. The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises is described in Table 1. I categorize the option exercises by whether there are between 10,000 and 99,999 shares, or 100,000 or more shares. The pre-SOX period is between January 1, 1997, and August 28, 2002. The abnormal stock return equals the cumulative stock return over a window starting on TD-15 minus the cumulative market return. The market return is measured by the CRSP value-weighted return including dividends (VWRET). All returns are expressed in percent form. TD denotes the reported transaction date of option exercise.

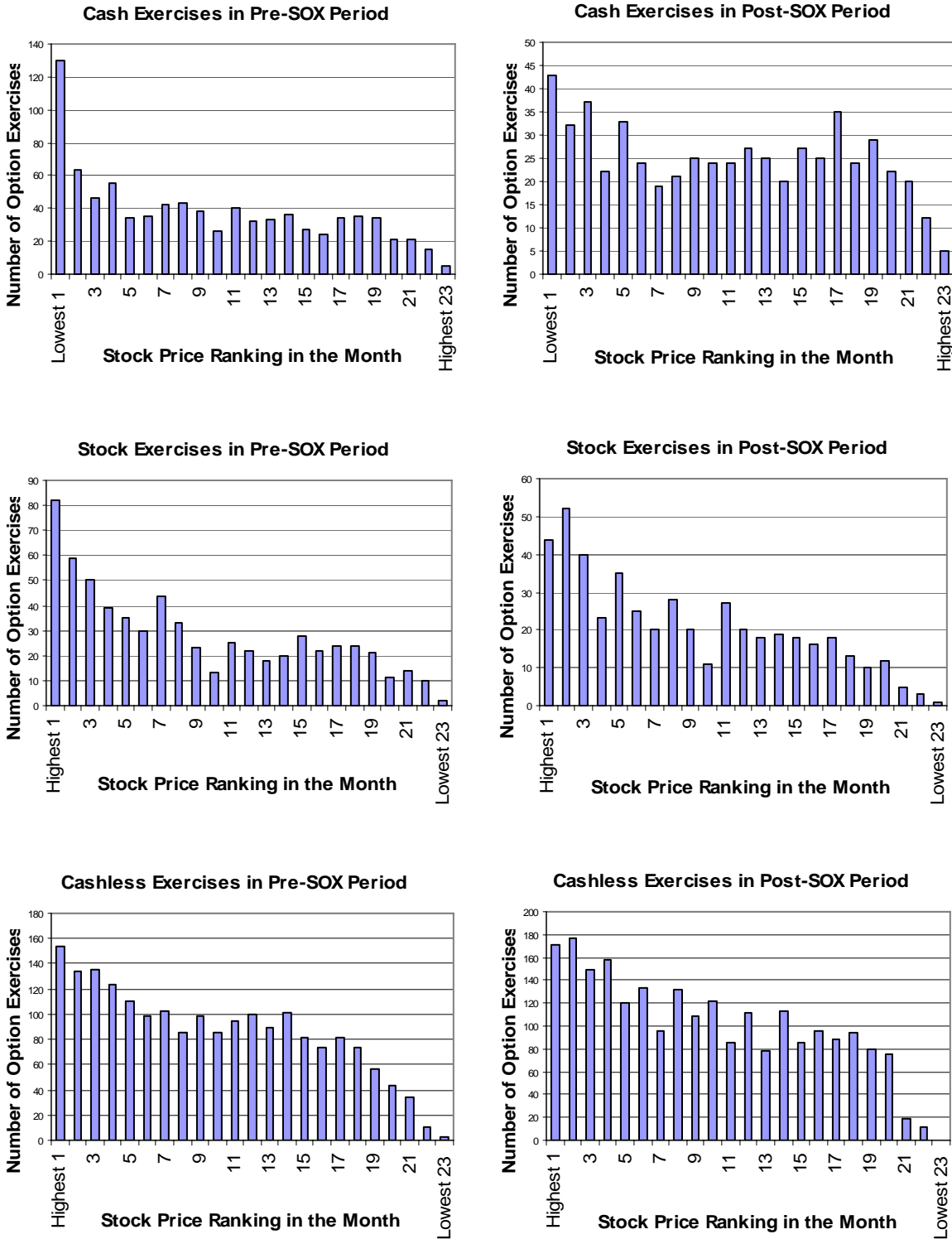


Figure 7. Distribution of the ranking of closing stock price on the option exercise date. The samples of option exercises and the identification of cash exercises, stock exercises, and cashless exercises is described in Table 1. The figures show the ranking of the closing stock price on the option exercise date relative to the remaining days of the month. In the top two panels of cash exercises, stock price ranking of one denotes the lowest closing stock price of the month. In the bottom four panels of stock and cashless exercises, stock price ranking of one denotes the highest closing stock price of the month.