Investor Reaction to First News of Option Backdating Probes

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PRELIMINARY AND INCOMPLETE.

November 16, 2007

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Abstract

We investigate investor reactions to two front-page *Wall Street Journal* news reports that highlighted SEC probes into widespread improper backdating of employee stock option grants. For a large sample comprising of all firms that made questionable executive stock option grants, we find mean abnormal 2-day returns around the first, November 11, 2005, report are negative and significant (-0.33%) and are, in the cross-section, associated with measures of the likelihood that the firm may have backdated option grants. By contrast, sample-wide mean abnormal 2-day returns around the second (but more famous, Pulitzer prize-winning) March 18, 2006, report are *not* significantly negative. This pattern of results suggests that investors had impounded the implications of the first report into stock prices and the second report did not incrementally affect their expectations. Interestingly, firms that subsequently admitted to or were alleged to have backdated are penalized around both reports. Overall, while the first report created spillovers to all stock option granting firms, the second report seems to have affected only firms most seriously at risk of regulatory action.

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1 Introduction

Lie [2005] documented that the incidence of fortuitously timed executive stock option grants (Yermack [1997], Aboody and Kasznik [2000]) dropped precipitously after the implementation of tighter stock option grant reporting rules enacted in the Sarbanes-Oxley Act of 2002. This finding suggested widespread *backdating* of stock option grants (option grants being recorded on a date preceding the actual grant date) and on November 11, 2005, *The Wall Street Journal* (hereafter, *Journal*) first reported that the SEC was investigating improper backdating of stock option grants. Four months later, a March 18, 2006, report titled *Perfect Payday* highlighted suspicious option grant timing at several public companies and earned the *Journal* a Pulitzer prize. These articles led to a veritable flood of SEC probes, admissions of corporate wrong-doing, accounting restatements and executive firings and/or resignations that are still ongoing and have been widely studied.[1]

While backdating, if authorized and properly accounted for, is perfectly legal and permissible, and may in some instance even be benign or inconsequential, unauthorized and unrecognized backdating can trigger severe adverse consequences.[2] For one thing, unless disclosed to investors, backdating violates US securities laws. Second, *in-the-money* stock option grants have unfavorable tax and accounting consequences. Backdated grants, upon being discovered, can lead to loss of tax shields and to accounting restatements. Consequently, when undisclosed backdating is detected, a firm faces both significant out-of-

[1] As of November 2007, allegations and revelations about backdating activity at major public companies continue to be a topic of extensive and prominent press coverage while the SSRN web-site lists over 30 papers with the word *backdating* in the title, abstract or keywords.

[2] Since backdated options are usually in-the-money grants, they are more valuable than un-backdated (at the money) options. If the number of options granted to rank and file employees is reduced when grants are backdated, then so is the resulting dilutive effect. If properly recorded, such backdating may be a relatively benign practice. However, if options granted to executives are backdated and the number of options granted is not reduced, as may happen for instance if a compensation committee is unaware of the backdating, managers may be able to award themselves overly generous grants (Walker [2007]). In addition, the employer also faces the serious financial reporting and tax consequences discussed in the text.

pocket costs (penalties, litigation costs) as well as potentially large opportunity costs (loss of reputation, regulatory sanctions, executive suite turmoil and turnover).

Several studies have examined investors' responses to firm-specific news of backdating activity (Narayanan, Schipani and Seyhun [2007], Becker and Lu [2007], Jain and Rezaee [2007]). These studies therefore speak to investor reactions for firms that either admit to or are accused of backdating (hereafter, *tainted* firms) at the time the admission or accusation is made. In contrast to these studies of firm-specific announcements only, Bernile and Jarrell [2007] also examine the impact of the March 18, 2006, *Journal* report (hereafter, *March 18 report*) on tainted firms' stock prices. They find that even though the March 18 report predated most of the firm-specific announcements,[3] there is a significant and negative market reaction for the tainted firms.

The finding that investors were able to form expectations about the potential impact of the backdating probes *before* any firm-specific disclosures occurred is very intriguing and opens up two further lines of inquiry. First, have similar reactions also occurred for other, *non-tainted*, firms that had made apparently questionable executive stock option grants? If at the date of the March 18 report, investors had little but suspicion to go on, there is little reason to believe that such suspicion would be confined only to the sub-set of tainted firms at a time when hundreds, possibly thousands, of firms were being alleged to have made questionable grants. Second, given investor reactions to the March 18 report, could investors also have reacted to the earlier, November 11, 2005 report (hereafter *November 11 report*)?

To address these questions, we include in our analysis all firms that had made executive stock option grants prior to the dates of these stories. Using various techniques developed in the literature for identifying backdated stock option grants, we develop an index of questionable stock option granting activity and investigate four key questions. First, did

[3] Of their sample of 130 tainted firms only six had made firm-specific disclosures *before* March 17, 2006.

investors react to the first news (November 11, 2005) of regulatory investigations? Second, was the cross-sectional variation of abnormal stock returns during the reaction window associated with the extent of questionable grants made by the firm? Third, at the time of first report, were investors able to further distinguish between tainted firms and non-tainted firms? Fourth, how, for this larger set of companies in our sample, did investors react to the March 18, 2006, report?

The first question addresses how investors reacted to the initial report of regulatory probes into backdating. In an efficient market, investors who were already aware of the potential adverse and costly ramifications of backdated grants would have impounded the expected costs of these regulatory actions into stock prices at the time of the initial report. The extent of investor reactions to the initial report, therefore, can provide evidence as to (1) whether investors were aware of the implications of the regulatory probes and (2) whether they expected the problem to be pervasive.

The second question builds on prior research which suggests factors such as industry membership and auditor identity affect the likelihood of backdating as does the presence of multiple suspicious grants. To the extent that these factors were publicly observable, if the stock returns observed around the time of the initial *Journal* report were triggered by concerns about backdating, we would expect the cross-sectional variation in event window stock returns to be related to variations in the determinants of the likelihood of backdating activity. A number of studies have suggested using the pattern of stock prices and stock returns around option grant dates to identify *suspect* option grants, i.e. grants likely to have been backdated (Bebchuk, Grinstein and Peyer [2006a and b], Heron and Lie [2006b], Narayanan, Schipani and Seyhun [2007] and Narayanan and Seyhun [2006]). We use the approaches suggested in these studies to develop firm-level *suspicion indices* (number of suspect grants scaled by all grants made by the firm). We then investigate whether the cross-

sectional variation in stock returns around the time of the two *Journal* reports varies systematically with the suspicion index, industry membership, measures of financial distress and auditor identity. Conducting this test increases our confidence that the observed market reaction is reliably attributable the backdating report.

The third question follows naturally from the second: how well were investors able to predict which firms would be most deeply implicated in the backdating scandal? Finding that firms that subsequently were implicated were punished more heavily around the date of the initial *Journal* report would suggest that investors were able to meaningfully distinguish between the two groups of firms from the beginning of the scandal. The fourth question addresses the incremental impact of the second, now more famous, *Journal* report of March 18, 2006.

Our key findings are as follows. First, the overall market reaction to the initial report of November 11, 2005, is significantly negative. This suggests that the initial news adversely affected the value of a large sample of stock-option granting firms and that investor response was not confined to just the set of tainted firms only. Second, the cross-sectional variation in stock returns is systematically associated (a) with the suspicion index (firms with a higher fraction of suspicious grants are penalized more), (b) with industry membership (technology and new economy firms are penalized more), (c) with firm's financial distress (more distressed or firms with lower Altman's Z score are penalized more), (d) with stock price volatility (more volatile firms are penalized more), and (e) with auditor identity (Big Four auditees are penalized less). The cross-sectional analyses strongly support the conclusion that the market reaction reflects investor responses to the news about backdating.

Third, we find some evidence that tainted firms experienced more negative returns in both event windows. Interestingly, these firms also had higher suspicion index scores relative to a sample of industry and size-matched control firms, suggesting that various methods

proposed in the literature to identify suspicious grants do in fact capture factors likely to be driving investors' concerns about the fallout from a news report. Finally, the overall market reaction around the time of the March 18, 2006, report is not statistically significant: investors seem to have incorporated the implications of the story into stock prices by the time the second article was published. Nevertheless, there is some evidence of cross-sectional variation in the return performance, i.e. stock returns are negatively related with the suspicion indices and industry dummies utilized in the analysis.

Our study complements extant research in four key respects. First, in addition to the sample of firms studied in prior research, our sample includes many more firms that also made suspicious grants *but were not subsequently identified as having backdated grants*. The market response for these firms has not been studied in prior research, leading to a potential understatement of the impact of the news. Second, we investigate determinants of the cross-sectional variation in (four-factor) abnormal stock returns, something prior studies have, for the most part, ignored. Third, we add to prior studies of the backdating scandal by investigating the market reaction to the first public report of widespread improper backdating activity on November 11, 2005. Prior research, has by contrast, focused on firm-specific news and in one case on the later, March 18, 2006, report. Finally, we develop indices of suspicious grant-making activity based on various approaches that have been developed for identifying backdated option grants. These indices control for the extent of a firm's stock option granting activity, yielding a metric of the "intensity" of questionable grant-making activity that is comparable across firms. Comparing indices across tainted and non-tainted firms also permits us to asses how well these approaches actually identify backdated grants.

The rest of the paper proceeds as follows. Section 2 discusses prior related research and research expectations. Section 3 describes the sample, data and research methods. Section 4 reports results, Section 5 discusses additional tests and Section 6 concludes.

2. Prior Research and Predictions

Extant studies of the market reaction to backdating news focus attention largely on firm-specific news announcements made by tainted firms. Narayanan, Schipani and Seyhun (2007) find that a sample of 44 firms alleged to have backdated experienced an average loss of 8% ($510 million) in market capitalization during a 21-day window around *firm-specific* backdating news. Bernile, Jarrell and Mulcahey (2006) find that for a sample of 110 firms identified by the *Wall Street Journal* as alleged backdaters, firm market capitalization declined by about 25% over a 140-day period around *firm-specific* backdating news. Jain and Rezaee (2007) find that within a sample of 180 alleged backdaters, firms with executive departures, shareholder lawsuit filings and higher stock volatility experience more negative returns around firm-specific backdating announcements. Becker and Lu (2007) find that firms facing regulatory probes experience a greater decrease in market value around firm-specific announcements than does a control sample of firms not facing such probes.

In contrast to studies which focus on firm-specific announcements of backdating, Bernile and Jarrell (2007) investigate the market reaction for a sample of 130 alleged backdaters during a 40-day window around the March 18, 2006 Wall Street Journal report and document a negative and significant mean market adjusted return (about -1%) over this period. As discussed earlier, at the time of the March 18 report, in only six cases had these firms been specifically identified as being backdaters. The remaining firms were apparently being penalized because investors expected them to face future regulatory penalties. Consequently investors can be expected to display similar anticipatory reactions to other firms that had also made suspicious grants. We investigate this possibility.

Given the investor reaction to the March 18 report, it is natural to ask if the earlier, November 11, 2005, report also caused similar (or stronger) reactions since that report was

the first to make public SEC investigations of backdating at several prominent companies. The November 11 report can be expected to have alerted rational investors to the potentially widespread nature of backdating activity. Moreover, to the extent that the tools to detect potentially suspect behavior (e.g. Lie's methodology) were already well known, investors would have been able to gauge (albeit with noise) the extent of questionable option granting activity at any particular firm. Thus even though the first *Journal* report identified by name only a relatively small number of firms, rational investors aware of the potential ramifications of the news that the SEC was systematically focusing on a particular type of activity, might well have anticipated the fallout to a much larger set of potentially at-risk firms. This would lead us to expect both a widespread reaction for firms that had a history of making questionably timed grants as well as a systematic pattern of cross-sectional variation in stock returns with firms having made more questionable grants being penalized more heavily.

Heron and Lie (2006b) find that backdaters tend to be technology firms, are smaller, have higher stock price volatility[4] and are more likely to be audited by non-Big-Five auditors. We therefore expect that high technology firms, firms with high stock price volatility, and firms audited by non-big 4 auditors will be penalized more heavily. Bebchuk et al. (2006a) also find that backdating firms tend to issue multiple "lucky" grants and tend (but are not restricted to) to be new economy firms. Nevertheless, past research has shown that new economy firms are more likely to use more stock-based compensation (Murphy 2003, Ittner, Lambert and Larcker 2003). To the extent a higher usage of stock-based compensation

[4] Walker (2007) also explains that firms with higher stock return volatility have a greater expected discount and have a greater incentive to backdate. Further, employees from such firms are more likely to exercise their options earlier. A shorter expected option life increases the expected value of the backdated option and also increases the firm's incentives to backdate. However, volatility is a two-edged sword in the sense that while the stock's volatility gives the option a "head start" in the option value, it is also likely that this head start will not persist till vesting, hence, reducing the incentives to backdate. Heron and Lie (2006b) find that firms with a higher stock volatility are more likely to backdate consistent with Walker's former explanations, suggesting that while the actual benefit to backdating is low, the perceived benefit to backdating increases the firms' incentives to backdate.

translates into more opportunities for backdating, we also analyze new economy firms. We expect such firms to be penalized more heavily. In addition, financial distress may affect firms' incentives to backdate: more distressed firms are likely to have fewer available avenues for increasing executive compensation and thus are more likely to backdate options to achieve that objective. We, therefore, expect that more financially distressed firms will be penalized more heavily.

In addition to these variables, we also use a measure of the extent of suspicious stock granting activity by a firm. Using different approaches drawn from prior research to classify grants as suspicious or not, we compute, for each firm, various suspicion indices defined as the number of suspicious grants scaled by the total number of grants made by the firm. The suspicion indices build on the Bebchuck et al. (2006a,b) finding that firms with multiple lucky (suspicious) grants are more likely to have backdated, but controls for the full extent of the firm's option granting activity. We expect firms with a higher suspicion index score to be penalized more heavily.

3 Methods and Data.

3.1 Identifying event dates and backdaters.

We searched the Lexis-Nexis database for all articles containing the keyword "backdating" in the full text of general news in major newspapers, business news in business and finance, and all available newswires for the year 2005. This search revealed three articles all dated November 11, 2005: (i) the front page article in *The Wall Street Journal*, (ii) an article mentioning *The Wall Street Journal* article on www.midnighttrader.com, and (iii) another article featuring options backdating posted on www.CFO.com[6]. Since the November

11, 2005, *Journal* article mentioned five firms by name (Analog Devices, Brocade, Mercury, Nyfix and Siebel Systems), we searched the Lexis-Nexis database for firm-specific news for these five firms for the years 2004 and 2005 using the keywords "option" and the respective firm names. This step checks for news that could be related to options backdating but for which the term "backdating" was not used.

Prior to November 11, 2005, the news reports focus on the timing of option grants[7] and not to options backdating (See Appendix I for details). Therefore, we focus on November 11, 2005, as our event date. To identify potentially confounding events, we searched the general news events reported in The *Wall Street Journal* for five days before and five days after November 11, 2005. None of the news identified appear to be systematically related to backdating activities (a list of the news events is available on request). To further investigate the extent to which investors were able to distinguish between firms at the time of the November 11, 2005, Journal report, we also identified 241 firms that were subsequently named in various sources such as the *Wall Street Journal* and the *Analyst Observer*[8] as having backdated option grants.

3.2 Sample Selection and Data Sources.

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[6] Heron and Lie (2006a) and Bizjak et al. (2006) quoted a report in Buffalo News on March 18, 2001 that made some reference to backdating. Also, Lie (2005) was published in May 2005. However, as the specific date when Lie's (2005) research was made available is unknown, it makes it difficult to run an event study around that date. Miller (2006) notes that the press can either play the role of an "original analyst" or that of a "rebroadcaster." The *Journal* article on November 11, 2005, highlights possible consequences to firms based on original interviews with accounting and legal experts. It also names five firms (Analog Devices, Brocade, Mercury, Nyfix and Siebel Systems) as specifically being at risk. Collectively, these features suggest that the November 11 report was not a mere rebroadcast of extant news.

[7] Narayanan and Seyhun (2006) describe that there are two types of option related games, one is commonly referred to as timing games where management time the grant of the options or time the news around the option grant, while the other is commonly referred to as dating games where management "cherry-pick" the dates that the options are supposedly granted.

[8] http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html, http://www.accountingobserver.com/blog/2006/12/more-backdating-guidance-coming-from-the-sec-and-a-list/.

We obtain options grant data from the Thomson Financial Insider Trading Table 2 Derivatives Database Form 4 filings. All firms with grants made to the CEO[9] with grant dates from 1 January 1996 to 30 September 2005 are included in our sample.[10] To be included in our sample, a firm must also have daily CRSP returns data available for the year ending two months before the month in which the news is reported. We use four-factor adjusted abnormal returns as measures of the investor reaction to news.[11] We obtain financial statement and auditor-related data from Compustat (Compustat 2006 version providing data up to May 2006). To ensure that the data is available to investors as of 11 November 2005, we use Compustat data from fiscal year 2004 (i.e. firms with valid annual data for the fiscal year ending from June 2004 to May 2005), so that the financial data has been in the public domain for at least four months as of the event day.

Table 1 provides details of data loss due to the informational requirements of the study. Scheduled grants are excluded because the timing of the former is fixed and thus not very susceptible to manipulation.[12] Grants not at-the-money are also excluded since they presumably would not have been the result of backdating manipulations (since the aim of intentional backdating is to disguise in-the-money grants as at-the-money grants). Since all

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[9] These include grants for the following executives coded by Thomson Financial as "CEO", "P", or "CB". We exclude any chairman of the board who is a non-executive director.

[10] Prior literature (Bebchuk et al., 2006a; Heron and Lie, 2006b) uses the timing of CEO grants to identify potential backdating and since some of our suspicion indices are based on the approach adopted in these studies, we also focus on CEO grants.

[11] Abnormal returns are computed by first estimating the coefficients (a, b, c, d and e) in the model:
$R=a + b*R_m + c*SML + d*HML + e*UMD + u$
where R is the daily raw stock return and R_m is the daily value weighted market return during the year ending two months before November 11, 2005. The number of observations per firm varies depending on the number of days the firm was traded during the year. We end the estimation period sixty days before the event to avoid any event-related shift in the return patterns. The daily factors *SML*, *HML* and *UMD* are obtained from http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/. The estimated coefficients are then used to compute an expected daily return within the event window for each firm given the values of the factors for that day. The abnormal return is the difference between the actual return and the expected return.

[12] A grant is scheduled when it is issued within 1 day of an option grant date in the prior year. For the remaining grants, they are scheduled if they are issued within 1 day of an option grant date in the subsequent year. All other grants are unscheduled.

the methods used to identify suspicious grants are based on stock price behavior around grant dates, we also exclude grants made during ex-dividend months (when stock prices go ex-dividend and thus can move appreciably even without any new information) and during months for which no stock prices are available (and thus stock price behavior cannot be examined). We also exclude grants made after September 2005, i.e. two months before the beginning of the month of the first news report, so as to ensure that the grants on which we base the suspicion indices are all likely to have become known to investors. Many of the firms are small and lack sufficient price data to compute abnormal returns with any degree of reliability, so we exclude them as well. Finally, some firms are not covered by *Compustat* so we cannot obtain relevant financial statement information and exclude them for our analysis. This leaves us with a final sample of 2,949 firms with usable data.

3.3 Suspicious Grants and Suspicion Indices.

We identify suspicious grants using various methods proposed in the literature.[13] In identifying suspicious grants, we ensure that grants are at the money (i.e. the exercise price equals the stock price on the grant date or the day before) and are unscheduled. The number of suspicious grants made by a firm constitutes the numerator of the suspicion index. Total firm-grants (the denominator of the index) are computed as the total option grants made by the firm over 1 January 1996 (the first date for which Thomson Financial data is available) to 31 October 2005. We discuss the various indices in more detail below.

Four methods of identifying suspicious grants have been proposed in the literature. Bebchuk et al. classify unscheduled at-the-money grants as *lucky*[14] if the exercise price equals either (1) the lowest price (Bebchuck et al. 2006a) during the calendar month in which

[13] All grants made by the firm on the same day count as 1 firm grant.
[14] Collins et al. (2005a,b, and 2006) uses those ranked in the lowest quintile, which is similar in concept to Bebchuk et al. (2006a,b).

the grant was made, or, (2) one of the three lowest prices (Bebchuck et al. 2006b) during the calendar month in which the grant was made. The ratio of the number of lucky grants made at the monthly minimum price, scaled by the total number of grants made (*BGP1*) and that of the number of lucky grants made at the three lowest monthly prices to the total number of grants made (*BGP2*) constitute our first two suspicion indices.

Heron and Lie (2006b) use a positive difference between 2-day (alternative, 20-day) returns after and before the stock grant date as evidence of a suspicious grant (the underlying intuition being that stock returns around a randomly chose date should be approximately centered around zero). We use the number of unscheduled grants with a positive difference between 2-day (20-day) post- and pre-grant returns scaled by the total number of grants made: the resulting measures, *HL2* and *HL20* comprise our next two suspicion indices.

Narayanan and Seyhun (2006) use reversals in stock returns to identify suspicious grants. If 10-day pre-grant returns are less than –α% and 10-day post grant returns are greater than +α%, the call the grant suspicious (they use α values of 0%, 2% and 5%). We compute the number of suspicious grants using each of the three cut-offs, 0%, 2% and 5%, and use the ratio of the average number of suspicious grants to the total number of grants to compute a suspicion index, *RSRR*. Narayanan et al. (2007), by contrast, use positive 5, 10, 20, 30, 40, 50 and 90-day post-grant stock returns to identify suspicious grants. We compute the number of unscheduled at-the-money grants with a positive post-grant stock return pattern for the 5-day, 10-day (*NSS10*), 20-day, 30-day, 40-day, 50-day and 90-day period respectively and use the ratio of the average number of suspicious grants to the total number of grants as another index (*NSS*). In addition to these measures, we also compute two summary indices: a)

SUSAVG is the average of all six measures (*BGP1*, *BGP2*, *HL2*, *HL20*, *NS10* and *NSS*), and b) *SUSTOTR* is the sum of the tercile rankings based on the six measures.[15]

4. Results.

4.1 Mean returns.

Table 2 reports daily mean abnormal returns (4-factor adjusted) for the final sample of 2,949 firms for a five-day period [day -2 to day +2] centered on the news report (November 11, 2005).[16] We employ two test statistics to infer statistical significance of the mean abnormal returns. One is the commonly used cross-sectional t-statistic (T). The other is a Z-statistic (Z) computed using a bootstrap variance estimate of the corresponding daily abnormal portfolio return over a 60 day window [day -76 to day -17] preceding the test period.[17] The bootstrap Z statistic is a more conservative test that adjusts for the cross-sectional correlation of event window returns (Campbell, Lo and MacKinlay 1997, Campbell 1997) and thus we derive inferences based on it.

Panel A of Table 2 reports the mean daily abnormal returns for the whole sample of 2,949 firms. The T statistic indicates that mean abnormal returns for days -2 and -1 are negative and significant (-0.19% and -0.33%, respectively) while the Z statistic shows a significantly negative reaction only for day -1 (p-value of 0.03).[18] We attribute this pattern of

[15] All firms are ranked and divided into terciles based on each measure. The rankings for the six measures are summed across each firm to derive SUSTOTR.

[16] Prior research emphasizes the importance of exploratory data analysis around the putative event date since the researcher can never know for sure if the observed date of information release if correct or not (see, e.g., Miller 2006).

[17] This test statistic avoids complications stemming from cross-sectional correlation in event-window returns by using bootstrap estimates of the variance of returns based on random samples drawn with replacement from the set of 60 returns observed over days [-76,-17]. Thus the variance used to test the significance of the mean return to portfolio of 2,949 grant-making firms is based on the variance of the returns to this sample of firms, while the variance used to test the mean return to the portfolio of alleged backdating firms is based on the variance of the returns to that portfolio over days [-76,-17] and so on.

[18] The results are similar when we use the market-model adjusted returns. We use the value-weighted return from the CRSP database in our market model. The results also remain similar when we drop the firms that

results to news leakage.[19] It is also worthy of note that November 11, 2005, was a Friday. DellaVigna and Pollet [2005] suggest that investor reactions to Friday news (specifically, earnings) releases are less pronounced than on other days, so the reaction observed on day 0 may reflect only partially investors' responses to the news.

Panels B and C of Table 2 report results for two sub-samples: 2,759 firms that have not been alleged of backdating (panel B) and 190 firms that admitted to or were alleged to have backdated options (panel C). The mean abnormal returns and the test statistics reported in panel B are very similar to those reported in panel A. Thus, the Z statistic shows the mean abnormal return for day -1 to be negative (-0.31%) and significant (p-value of 0.04). Panel C shows that the 190 alleged backdaters suffered a loss on day -1 that is significant (p-value of 0.04) and almost double (-0.598%) the loss suffered by all other sample firms (-0.31% in panel B). The results of panel C suggest that around the November 11 report investors were able to sort out firms that were likely to be involved in backdating activities. The results of panels A and B suggest that investor concerns about backdating spilled over to the wider set of firms granting stock options.

Additional untabulated results show two patterns worthy of note. First, the return on day -1 is the *most negative* in the 30 days surrounding the event date and the only day that is statistically significant using the bootstrap Z-Statistic. Second, for the sample of 125 alleged backdaters used in Bernile and Jarrell (2007) mean abnormal returns are as large as those

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were subsequently reported in the financial press as possible backdaters. The results also remain similar when we exclude stocks with stock prices less than $1. We also attempt to obtain a sample of firms that have never done any SEC filings with respect to option grants throughout the sample period from 1 January 1996 to 31 October 2005. For this sample of firms, the four-factor adjusted returns on event day -1 is statistically insignificant using both the T and Z statistics.

[19] The Journal report quoted the views of academics and legal experts on the consequences to firms of backdating as well as statements made by officers of the firms under investigation. Given the large number of people involved in breaking a story of this magnitude, it is possible that leakage may explain the observed pattern of returns.

observed during the later, March 18, 2006 report and about 40% of the returns around the firm-specific news (admission or allegation of backdating) date.

Table 3 reports the corresponding results for the second *Journal* report on March 18, 2006. The full sample for this window is smaller than the full sample for the November 11, 2005 window due to insufficient data for 122 firms. Unlike Table 2, the mean abnormal daily returns reported in all three panels of Table 3 show very little evidence of a systematic, sample-wide reaction. In panel C, the mean abnormal return in day -1 for the sub-sample of 183 backdaters is negative (-0.39%) and significant using the T-statistic, but once event window return correlations are accounted for, the bootstrap Z-statistic shows that returns are not significant even for this sub-sample. Our results are comparable to Bernile and Jarrell who find insignificant negative mean market-model industry adjusted returns for their sample of 130 backdaters as well. Overall, the pattern of results in Tables 2 and 3 indicates that the primary and most substantial reaction to backdating news appears to have occurred around the date of the first news report in November 2005.

4.2 Suspicion Indices

Table 4 reports descriptive statistics for the suspicion indices and several other variables used in a factor analysis to identify variables that may affect the cross-sectional variation in the returns tabulated in Tables 2 and 3. The sample consists of several very large firms: Mean total assets are about $2,653 million per firm (mean sales, about $2,390 million). Mean (median) Altman Z scores, an overall measure of financial distress is abut 5.9 (about 3.7) suggesting the average sample firm is not financially distressed (given a usual cutoff of 3.0). Mean and median stock return volatility are quite close at about 2.7% (mean) and 2.4% (median). About 84% of the sample is audited by Big Four auditors. New economy and high

technology firms constitute a disproportionately large part of the sample (about 19% and about 10% respectively) relative to their base rates in the entire economy (not shown).

Prior research suggests that the corporate governance environment of the firm is related to options backdating as well (Collins et al. (2007)). As such, we include an additional variable, average proportion of number of outside directors (or "Prop_Nosdirgrants"). This is computed using the number of outside directors to whom option grants are issued on the same day that grants were made to CEO divided by the total number of persons granted option grants on that day. This proportion is averaged over the sample period. In about 36% of cases, outside directors are also granted shares on the dates of executive stock option grants (Prop_Nosdirgrants) while about 13% of the grants studied are scheduled grants (Prop_Scheduled).[20] The means of the various suspicion indices range from about 6.5% for BGP1 to 34% for NSS and the two BGP indices seem to display considerable skewness (both have zero as their median value). The skewness is smoothed out in the average index (SUCAVG) which has a mean of about 20% and a median value of about 17%: somewhere between 17% and 20% of all grants made by the "average" firm are classified as suspect.

4.3 Conditional Analyses of Overall Market Reaction

Table 5 shows the results of a univariate analysis of abnormal returns to hedge portfolios formed by ranking the sample firms on each of the various suspicion indices. Since Tables 2 and 3 suggest that the reaction happened primarily on day -1, to guard against noise introduced by using too wide a window (Miller 2006) we use day -1 abnormal returns (*RET[-1]*) as one of three measures of hedge returns. Jain and Rezaee (2007) suggest two additional measures: the minimum of abnormal returns over days [-1,0] (*MINRET*) captures the

[20] This is the number of scheduled grants divided by the total grants over the total sample period examined in the paper.

possibility that for some firms the reaction occurred on day -1 and for others on day 0 while the cumulative abnormal returns over [-1,0] (*CUMRET*) captures lagged reactions or reversals of the initial market reaction. For each suspicion index, hedges are formed by going short in firms with high suspicion scores and long in firms with low suspicion scores. If investors penalize firms with higher suspicion scores, hedge returns are expected to be positive, otherwise zero. Without exception, hedge returns for the November 11, 2005, window reported in Table 5 are highly significantly positive across all suspicion indices. The pattern of univariate hedge returns around the March 18, 2006 report is strikingly different: only the hedge formed on *RSRR* is significant in the *RET[-1]* column and none of the hedges are significant in the *CUMRET* column. All the hedges yield significant positive returns in the *MINRET* column suggesting that there may have been some systematic reaction on either day -1 or day 0, but as the results of the *CUMRET* column suggest, the price movements being picked up in this column were most likely transient and were quickly reversed. Overall, these univariate analyses show that the cross-sectional variation of investor reaction to the initial news for our sample of firms is related to the likely extent of backdating activity as measured by the suspicion indices and provides some validation that the investor reaction documented in Table 2 is related to the option backdating news report.

4.4 Decomposing the cross-sectional variation: Factor analysis and Regressions.

Since the various suspicion indices are highly correlated and the sample firms are largely to be found in particular industries, we conduct a principal component analysis (Johnson and Wichern [2002]) that reduces the complex of variables listed in Table 4 into four principal components. This reduction permits us to avoid concerns stemming from multicollinearity among explanatory variables to be used in the cross-sectional regressions.

We use a general rule of thumb to retain the number of principal components whose eigenvalue is greater than 1. The factor pattern matrix, which shows the correlation between each of the retained principal components and the fourteen variables, is presented in Table 6. The higher the magnitude of the correlation, the more the principal component reflects the information contained in a given variable. The first principal component (factor 1) appears to be a combination of the suspicion indices and Prop_Scheduled so we label it "Suspicious." Newecy and HighTech have the highest correlation with the second principal component (factor 2) so we label this as an Industry Factor. The third principal component loads on auditor type and stock return volatility and, for simplicity, we label it Risk. The fourth principal component appears to be a combination of Altman's Z (financial distress) and Prop_Nosdir (governance) so we label it as Distress. We use these loadings to compute four principal component scores for each firm and then estimate the following models using OLS with heteroskedasticity corrected (White) standard errors:

RET[-1] or *CUMRET[-1,0]* or *CUMRET[-2,+2] = a + b*Suspicious + c* Industry + d* Risk factor + e* Distress + f * Backdater dummy + u*

RET [-1], CUMRET[-1,0] and *CUMRET[-2,+2]* are the day -1 return, the cumulative return over days -1 and 0, and the cumulative return over days -2 through +2, respectively. The factors *Suspicious* through *Distress* are the principal components scores described above and *Backdater dummy* takes the value one for tainted firms and zero otherwise.

Table 7, panel A reports the regression results for the November 11, 2005, window. In all three regressions the intercept is negative and highly significant indicating an average negative reaction for the 2,949 sample firms regardless of the length of the window. In the first (day -1) regression both the suspicious and industry factors are significantly negative (-0.0014 and -0.0018, respectively) implying additional penalties for firms with more suspicious grants and in the new economy and high technology industries. Although the

backdater dummy obtains a negative coefficient (-0.0026) it is not significant. Perhaps its effect is subsumed to some extend by the suspicion index. In the second regression the industry factor maintains its significance while the suspicious factor looses it. However, the backdater dummy is now significant with a negative coefficient (-0.0061) implying that investors identified within the two-day window firms that were subsequently accused of backdating. Taken together, regressions (1) and (2) show that abnormal returns during the November 11, 2005, window vary systematically with ex-ante and ex-post indicators of backdating. Therefore, the detected significant market reaction appears to be due to the backdating news in the journal report. These results[21] become even stronger in (untabulated) robust regressions, which downweight potential outliers[22]. In these regressions, the coefficient on the backdater dummy is negative and significant in two out of three regressions. Thus around the first news report the market may had had greater doubts about the tainted firms but the evidence on this score is mixed and does not show up in the robust-standard-error OLS analysis in Table 7.

Table 7, Panel B shows the corresponding results for the March 18, 2006, window. The overall pattern of these results is quite different from that in Panel A: the regression intercepts are not significant and there is no evidence of significant association between suspicion and abnormal returns. The backdater dummy is significant in the first (day -1) regression, but not in the other two regressions. Thus the market reaction to the March 18 report seems confined largely to the sample of tainted firms. Additional results (untabulated) from robust regressions show that the suspicion score is marginally significant in two of the

[21] In general, when the dependent variables are replaced using daily market-model adjusted return, minimum market-model adjusted returns over day -1 and day 0 and the cumulative market-model adjusted returns over day -1 to day 0, the results remain similar. Inferences remain similar when the firms that were reported or subsequently reported in the financial press as alleged backdaters are dropped from the analysis.
[22] Outliers with Cook's distance greater than 1 are dropped from the sample. The remaining observations are weighted based on the leverage scores of the observations. The higher the leverage, the lower the weight. Median regressions which minimize the least absolute deviations yields similar results.

three regressions, but the magnitude is so small and the overall model fit so poor as to render these estimates unreliable. Overall, we conclude that the second report affected only the sample of tainted firms and not the overall sample of all option granting firms.

Taken together, the results reported in Table 7 paint a picture in which the first news report on November 11, 2005 which named only four firms caused an immediate market-wide reaction (spillover) for all firms that had made suspicious executive stock option grants. By contrast, the later, March 18, 2006, report appears to have caused investors to revalue only firms that had a high risk of facing subsequent disclosures and regulatory scrutiny.

5. Additional analyses.

We also examined several other news dates for similar reactions. A news search (see Appendix I for dates) shows that as early as March 30, 2004, press coverage had begun to report that the SEC was investigating whether firms were timing news releases around option grant dates. However we found no significant market reaction around this date. This news was followed by a string of firm-specific news or general news related to the timing of news around option grants. We also examined the day Nyfix announced the resignation of Deloitte and Touche (October 27, 2005). Given the Enron-Arthur Andersen debacle, we wanted to examine if an auditor resignation from a company facing backdating problems would send a signal to the rest of the market relating to the potential severity of the stock options backdating issue. While there was a statistically significant negative reaction of -0.26% on day 0, both the OLS and robust regression results show no association between abnormal returns and either the suspicion factor or the backdater dummy. E-mail correspondence with the author of the *Journal* reporter, Mark Maremont, confirms that November 11, 2005 was the first report on the options backdating phenomenon. He brought to our attention another *Journal* article dated November 2, 2005 that reported on Mercury International executives

resigning in the wake of an SEC probe. However we detected no significant market reaction on that day.

Finally, to increase our confidence in the interpretation of the suspicion scores, we compared tainted firms' suspicion scores to those of a size and industry-matched control sample. These results, reported in Table 8 show that four of the six suspicion indices as well as the average suspicion score are significantly higher for tainted firms than for the non-tainted sample. Overall, therefore, the suspicion indices appear to both explain stock returns during bad news windows and be positively associated with the likelihood of a firm admitting to or being accused of backdating. This finding suggests that these scores may be useful in future research on stock option backdating.

6. Summary and Conclusions

We investigate investor reaction to two key news reports of widespread backdating activity and associated regulatory probes. Using evidence from stock returns to a large sample of over 2400 firms that made executive stock option grants, we find investors impound the news into stock prices around the time of the first, November 11, 2005 news report: after controlling for factors identified in prior research as associated with backdating activity, the cross sectional variation in abnormal (four-factor) stock returns is negatively associated with several suspicion indices that measure the proportion of suspicious stock option grants made by the firm, and with whether or not the firm was (subsequently) alleged to have backdated. These findings imply that not only did investors impound information about the firm's past pattern of stock option granting activity, but also had some insight into the likely egregiousness of these grants. Overall, the evidence suggests that the first news report created a market-wide concern that was not confined to a handful of egregious offenders but spilled over to all firms that had made executive stock option grants. This

widespread reaction stands in contrast to an insignificant overall investor reaction to the later (but more famous) March 18, 2006, Wall Street Journal report. Finally, the suspicion indices developed in this study are found to be systematically associated with investor reactions and thus may be useful to researchers interested in corporate governance, strategy and performance as well as in financial reporting and audit quality.

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Table 1

Sample Construction

	Firm-grants	Firms
Number of Firm-Grants from Thomson Financial Insider with grants made to CEOs from 1 January 1996 to 31 December 2006	42,147	9,233
Less: Number of firm grants without CRSP daily prices to re-examine exercise dates	(7,735)	(2,147)
Number of Firm-Grants from Thomson Financial Insider with grants made to CEOs from 1 January 1996 to 31 December 2006 with CRSP daily data around grant dates	34,412	7,086
Less: Scheduled grants	(5,728)	
Less: Grants not issued at-the-money	(11,007)	
Less: Grants issued in the month of an ex-dividend date	(1,658)	
Less: Grants without stock prices for the entire month to compute "lucky" grants	(845)	
Less: Grants granted after 30 September 2005*	(1,533)	
		900
Remaining grants	13,641	7,986
Less: Firms without CRSP data to compute volatility of returns (standard deviation of returns of the year ending 2 months before the month the news was reported) or the predicted coefficients of the four-factor model		(3,628)
Remaining Firms before consideration of Compustat Data		4,358
Less: Firms with missing Compustat Data		(1,409)
Final Sample		2,949

* December 31, 2005 for the firms in the March 18, 2006 event sample.

Table 2

Daily Returns around November 11, 2005

Panel A: Full sample (2,949 Option Granting Firms)

Date	Event Time	4-Factor Adjusted Return	*T*	P(|*t*|)≥*T*	*Z*	P(|z|)≥*Z*	
11/9/2005	-2	-0.00190	-3.387	<.001***	-1.253	0.21	
11/10/2005	-1	-0.00333	-5.533	<.001***	-2.192	0.03	**
11/11/2005	0	0.00012	0.201	0.84	0.081	0.94	
11/14/2005	1	0.00034	0.619	0.54	0.224	0.82	
11/15/2005	2	-0.00062	-1.007	0.31	-0.408	0.68	

Panel B: 2,759 Non-tainted firms

Date	Event Time	4-Factor Adjusted Return	*T*	P(|*t*|)≥*T*	*Z*	P(|z|)≥*Z*	
11/9/2005	-2	-0.00171	-2.939	<.001***	-1.146	0.25	
11/10/2005	-1	-0.00314	-4.977	<.001***	-2.106	0.04	**
11/11/2005	0	0.00039	0.603	0.55	0.263	0.79	
11/14/2005	1	0.00009	0.158	0.87	0.061	0.95	
11/15/2005	2	-0.00075	-1.161	0.25	-0.500	0.62	

Panel C: 190 Alleged Backdaters

Date	Event Time	4-Factor Adjusted Return	*T*	P(|*t*|)≥*T*	*Z*	P(|z|)≥*Z*	
11/9/2005	-2	-0.00469	-2.20298	0.03**	-1.60703	0.11	
11/10/2005	-1	-0.00598	-3.48896	<.001***	-2.05121	0.04	**
11/11/2005	0	-0.00379	-3.31036	<.001***	-1.29801	0.19	
11/14/2005	1	0.00395	2.50006	0.01***	1.35410	0.18	
11/15/2005	2	0.00123	0.63685	0.52	0.42172	0.67	

*, ** and *** indicate significance at 10%, 5% and 1% levels (two-tailed).

Four factor returns are estimated using the model $R=a+b*R_m+c*SML+d*HML + e*UMD + u$, using twelve calendar months of daily data ending one month before the event date. *R* is the daily raw stock return and R_m is the daily value weighted market return. The daily factors *SML*, *HML* and *UMD* are obtained from Professor Kenneth French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

P(|t|)≥T is a 2-tailed p-value computed based on cross-sectional T-Statistics. P(|z|)≥Z is a 2-tailed p-value computed based on a Z-Statistic. For the calculation of the Z-statistic an out-of-sample estimate of the standard deviation of daily mean returns for the sample of firms in each panel. The out-of-sample estimate is derived from bootstrap estimates based on 10,000 random samples drawn with replacement from 60 daily mean returns observed over days [-76,-17].

Excluding stocks with prices below $1 yields similar results.

Table 3

Daily Returns around March 18, 2006

Panel A: For 2,827 Option Granting Firms

Date	Event Time	4-Factor Adjusted Return	*T*	P(|*t*|)≥*T*	*Z*	P(|z|)≥*Z*
3/15/2006	-2	-0.00013	-0.29667	0.77	-0.12063	0.90
3/16/2006	-1	-0.00007	-0.13571	0.89	-0.06731	0.95
3/17/2006	0	0.00033	0.63418	0.53	0.29930	0.76
3/20/2006	1	0.00110	2.03046	0.04**	1.00686	0.31
3/21/2006	2	0.00124	2.59656	0.01***	1.13536	0.26

Panel B: For 2,644 Option Granting Firms Excluding Alleged Backdaters

Date	Event Time	4-Factor Adjusted Return	*T*	P(|*t*|)≥*T*	*Z*	P(|z|)≥*Z*
3/15/2006	-2	-0.00027	-0.59050	0.55	-0.24398	0.81
3/16/2006	-1	0.00019	0.33529	0.74	0.16891	0.87
3/17/2006	0	0.00028	0.51867	0.60	0.24728	0.80
3/20/2006	1	0.00110	1.94420	0.05**	0.98369	0.33
3/21/2006	2	0.00115	2.29089	0.02**	1.02079	0.31

Panel C: For 183 Alleged Backdaters

Date	Event Time	4-Factor Adjusted Return	*T*	P(|*t*|)≥*T*	*Z*	P(|z|)≥*Z*
3/15/2006	-2	0.00191	1.19831	0.23	0.78846	0.43
3/16/2006	-1	-0.00388	-1.99285	0.05**	-1.59910	0.11
3/17/2006	0	0.00106	0.51894	0.60	0.43722	0.66
3/20/2006	1	0.00111	0.61114	0.54	0.45592	0.65
3/21/2006	2	0.00268	1.64196	0.10*	1.10528	0.27

*, ** and *** indicate significance at 10%, 5% and 1% levels (two-tailed).

Four factor returns are estimated using the model $R=a+b*R_m+c*SML+d*HML + e*UMD + u$, using twelve calendar months of daily data ending one month before the event date. *R* is the daily raw stock return and R_m is the daily value weighted market return. The daily factors *SML*, *HML* and *UMD* are obtained from Professor Kenneth French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

P(|t|)≥T is a 2-tailed p-value computed based on cross-sectional T-Statistics. P(|z|)≥Z is a 2-tailed p-value computed based on a Z-Statistic. For the calculation of the Z-statistic an out-of-sample estimate of the standard deviation of daily mean returns for the sample of firms in each panel. The out-of-sample estimate is derived from bootstrap estimates based on 10,000 random samples drawn with replacement from 60 daily mean returns observed over days [-76,-17].

Excluding stocks with prices below $1 yields similar results.

Table 4

Descriptive Statistics for Suspicion Indices and other variables used in factor analysis.

Variable	Mean	Standard Deviation	25th Percentile	Median	75th Percentile
Total Assets (in mil)	2653.57	9543.29	90.61	361.16	1403.35
Altman's Z score	5.899	13.71	2.03	3.73	6.46
Volatility of Stock Returns	0.027	0.014	0.018	0.0242	0.033
Big 4 (Proportion)	0.837	0.368	1.00	1.00	1.00
Newecy (Proportion)	0.191	0.393	0	0	0
HighTech (Proportion)	0.100	0.300	0	0	0
Prop_Nosdirgrants	0.364	0.195	0.24	0.37	0.50
Prop_Scheduled	0.134	0.186	0	0	0.25
BGP1	0.065	0.149	0	0	0
BGP2	0.148	0.222	0	0	0.25
NSS	0.339	0.282	0.05	0.325	0.54
HL2	0.309	0.305	0	0.25	0.50
HL20	0.312	0.306	0	0.25	0.50
RSRR	0.150	0.205	0	0.060	0.25
SUSAVG	0.203	0.191	0.025	0.173	0.315
SUSTOTR	5.127	3.223	2.00	5.00	8.00

Total Assets is Compustat data item number 6. *Altman's Z* is computed as 1.2*(data 179/data 6)+1.4*(data 36/data 6)+3.3*((data 170 + data 15 - data 62)/data 6)+0.6*((data 24 x data 25)/data 181)+0.999*(data 12/data 6) where *data n* is Compustat data item number *n*. *Big 4* equals 1 if the auditor is Deloitte and Touche, Ernst and Young, PriceWaterhouseCoopers or KPMG, 0 otherwise. *Newecy* equals 1 when DNUM = (3500, 3570-3572, 3575-3577, 3661, 3674, 4800, 4810, 4812-4813, 5045, 5961, 7370-7379), 0 otherwise. *HighTech* equals 1 when DNUM = (7370-7379), 0 otherwise. *Prop_Nosdirgrants* is the number of outside directors who are issued grants the same day as the CEO divided by the total number of executives issued grants on the same day. A grant is scheduled when it is issued within 1 day of an option grant date in the prior year or if they are issued within 1 day of an option grant date in the subsequent year. *Prop_Scheduled* is the total of grants which are scheduled divided by total grants. *BGP1* is the total of lucky grants that are issued at the lowest price of the calendar month of the option grant date divided by total grants over the sample period. *BGP2* is the total of lucky grants that are issued at the lowest three prices of the calendar month of the option grant date divided by total grants over the sample period. *NSS* is the total of lucky grants which post-grant returns are positive divided by total grants over the sample period, *HL2* (*HL20*) is the total of lucky grants which the differences in the 2-day (20-day) returns between the post-grant period and the pre-grant period is positive divided by total grants over the sample period. *RSRR* is the total of lucky grants which post-grant return is positive AND the pre-grant return is negative divided by total grants over the sample period. *SUSAVG* is the average of the six indices, while *SUSTOTR* is the total of the tercile ranks of the firm obtained when ranked on each of the six indices.

Table 5

Hedge Returns

Portfolios are formed so that the expected return on the hedge portfolio is positive. Sample firms are ranked into terciles of suspicion scores from highest to lowest. We expect investors to view firms with high suspicious score more negatively than firms with low suspicious score. We go long on the portfolio of firms with low suspicious scores and short on the portfolio of firms with high suspicious score. Hedge returns are then computed as the difference in returns between the two portfolios.

Panel A: November 11, 2005			
Measure	RET[-1]	MINRET	CUMRET
BGP1	0.004 ***	0.003 ***	0.005 ***
BGP2	0.003 ***	0.003 ***	0.003 ***
NSS	0.003 ***	0.003 ***	0.004 ***
HL2	0.003 ***	0.004 ***	0.004 **
HL20	0.003 ***	0.003 **	0.004 **
RSRR	0.005 ***	0.004 ***	0.005 ***
SUSAVG	0.001 ***	0.004 ***	0.004 ***
SUSTOTR	0.004 ***	0.003 ***	0.004 **

Panel B: March 18, 2006			
Measure	RET[-1]	MINRET	CUMRET
BGP1	0.0014	0.0033 ***	0.0026
BGP2	0.0005	0.0029 ***	0.001
NSS	0.0004	0.0028 ***	0.0005
HL2	0.0013	0.003 ***	0.0005
HL20	0	0.0024 ***	0.0003
RSRR	0.0018 *	0.0029 ***	0.0022
SUSAVG	0.0012	0.0036 ***	0.001
SUSTOTR	0.0011	0.003 ***	0.0006

*, ** and *** indicate significance at 10%, 5% and 1% respectively (two-tailed).

BGP1 is the total of lucky grants that are issued at the lowest price of the calendar month of the option grant date divided by total grants over the sample period. *BGP2* is the total of lucky grants that are issued at the lowest three prices of the calendar month of the option grant date divided by total grants over the sample period. *NSS* is the total of lucky grants which post-grant returns are positive divided by total grants over the sample period, *HL2* (*HL20*) is the total of lucky grants which the differences in the 2-day (20-day) returns between the post-grant period and the pre-grant period is positive divided by total grants over the sample period. *RSRR* is the total of lucky grants which post-grant return is positive AND the pre-grant return is negative divided by total grants over the sample period. *SUSAVG* is the average of the six indices, while *SUSTOTR* is the total of the tercile ranks of the firm obtained when ranked on each of the six indices.

Table 6

Factor Pattern Matrix (Principal Component Analysis)

Panel A. November 11, 2005.

Variable	Factor 1 (Suspicious)	Factor 2 (Industry)	Factor 3 (Risk)	Factor 4 (Distress)
Total Assets	-0.24776	-0.19538	0.49255	-0.26340
Hightech	0.24498	**0.77847**	0.40985	0.04651
Newecy	0.27169	**0.76762**	0.41722	0.05483
Big4	-0.11124	-0.27651	**0.56067**	0.49083
Altman's Z	0.07755	0.02597	-0.17750	**0.55525**
Ivolatility	0.23667	0.42893	**-0.58220**	-0.16791
Prop_Nosdirgrants	0.15645	0.08419	-0.32748	**0.53967**
Proportion_sch	**-0.42879**	-0.18853	0.26408	0.07696
HL2	**0.81371**	-0.13475	0.04789	0.06125
HL20	**0.85008**	-0.12039	0.03105	0.04678
BGP1	**0.64853**	-0.18847	0.10393	-0.17191
BGP2	**0.80779**	-0.15120	0.09189	-0.15125
NSS	**0.85128**	-0.13956	0.00776	0.09787
RSRR	**0.79635**	-0.12658	0.09175	-0.03886

Panel B. March 18, 2006.

Variable	Factor 1 (Suspicious)	Factor 2 (Industry)	Factor 3 (Risk)	Factor 4 (Distress)
Total Assets	-0.24632	-0.08501	0.50030	-0.27955
Hightech	0.24162	**0.84957**	0.23326	0.05627
Newecy	0.28038	**0.83436**	0.23799	0.06641
Big4	-0.12264	-0.11790	**0.62763**	0.40103
Altman's Z	0.08717	-0.10182	-0.13475	**0.67549**
Ivolatility	0.25213	0.25077	**-0.67270**	-0.21066
Prop_Nosdirgrants	0.15814	0.04195	-0.36358	**0.48297**
Proportion_sch	**-0.44399**	-0.11989	0.29326	0.06068
HL2	**0.82036**	-0.11171	0.07512	0.03181
HL20	**0.85268**	-0.10873	0.05798	0.03981
BGP1	**0.64672**	-0.17866	0.14464	-0.14559
BGP2	**0.80607**	-0.13045	0.12622	-0.11563
NSS	**0.84880**	-0.12706	0.04875	0.07128
RSRR	**0.80141**	-0.09473	0.12285	-0.05028

Total Assets is Compustat data item number 6. *Altman's Z* is computed as 1.2*(data 179/data 6)+1.4*(data 36/data 6)+3.3*((data 170 + data 15 - data 62)/data 6)+0.6*((data 24 x data 25)/data 181)+0.999*(data 12/data 6) where *data n* is Compustat data item number *n*. *Big 4* equals 1 if the auditor is Deloitte and Touche, Ernst and Young, PriceWaterhouseCoopers or KPMG, 0 otherwise. *Newecy* equals 1 when DNUM = (3500, 3570-3572, 3575-3577, 3661, 3674, 4800, 4810, 4812-4813, 5045, 5961, 7370-7379), 0 otherwise. *HighTech* equals 1 when DNUM = (7370-7379), 0 otherwise. *Prop_Nosdirgrants* is the number of outside directors who are issued grants the same day as the CEO divided by the total number of executives issued grants on the same day. A grant is scheduled when it is issued within 1 day of an option grant date in the prior year or if they are issued within 1 day of an option grant date in the subsequent year. *Prop_Scheduled* is the total of grants which are scheduled divided by total grants. *BGP1* is the total of lucky grants that are issued at the lowest price of the calendar month of the option grant date divided by total grants over the sample period. *BGP2* is the total of lucky grants that are issued at the lowest three prices of the calendar month of the option grant date divided by total grants over the sample period. *NSS* is the total of lucky grants which post-grant returns are positive divided by total grants over the sample period, *HL2* (*HL20*) is the total of lucky grants which the differences in the 2-day (20-day) returns between the post-grant period

and the pre-grant period is positive divided by total grants over the sample period. *RSRR* is the total of lucky grants which post-grant return is positive AND the pre-grant return is negative divided by total grants over the sample period. *SUSAVG* is the average of the six indices, while *SUSTOTR* is the total of the tercile ranks of the firm obtained when ranked on each of the six indices.

Table 7

Event-window regressions.

Panel A: November 11, 2005						
	(1)		(2)		(3)	
	RET [-1]		*CUM [-1,0]*		*CUM[-2,+2]*	
Suspicious	-0.00143	**	-0.0007		-0.00085	
	(0.031)		(0.425)		(0.467)	
Industry	-0.00182	***	-0.00183	*	-0.00298	**
	(0.009)		(0.053)		(0.044)	
Risk	0.00134	*	-0.00001		0.00405	***
	(0.079)		(0.993)		(0.005)	
Distress	0.00101		0.00041		0.00159	
	(0.157)		(0.687)		(0.269)	
Backdater dummy	-0.00255		-0.00613	***	-0.00577	
	(0.179)		(0.009)		(0.124)	
Constant	-0.00316	***	-0.00296	***	-0.00522	***
	(0.000)		(0.000)		0.000	
N	2949		2949		2949	
Adjusted R^2	0.0060		0.0020		0.0050	
Panel B: March 18, 2006						
	(4)		(5)		(6)	
	RET [-1]		*CUM [-1,0]*		*CUM[-2,+2]*	
Suspicious	-0.00013		-0.00011		-0.00019	
	(0.821)		(0.885)		(0.860)	
Industry	-0.00119	**	-0.00127	*	0.00057	
	(0.022)		(0.080)		(0.640)	
Risk	0.00063		-0.00054		-0.00388	
	(0.347)		(0.532)		(0.009)	***
Distress	0.00017		-0.00023		-0.00097	
	(0.818)		(0.793)		(0.470)	
Backdater dummy	-0.00399	**	-0.00254		0.00282	
	(0.050)		(0.395)		(0.558)	
Constant	0.00017		0.0004		0.00217	
	(0.760)		(0.609)		(0.058)	*
N	2819		2819		2819	
Adjusted R^2	0.0020		0.0000		0.0030	

*, ** and *** indicate significance at 10%, 5% and 1% respectively (two-tailed).

Suspicious, *Industry*, *Risk* and *Distress* are factor scores computed using the weights shown in Table 6. Backdater Dummy takes the value 1 if the firm subsequently admits to or is alleged to have backdated.

Table 8

Comparison of Suspicion Scores for Backdaters vs. a Control Sample

Variable	Backdaters (1)	Control* (2)	Difference (1)-(2)	p-value (2-tail)	
Number of firms	81	116			
BGP1	0.136	0.057	0.079	**0.002**	***
BGP2	0.280	0.188	0.092	**0.021**	**
NSS	0.492	0.415	0.077	0.168	
HL2	0.478	0.386	0.092	**0.047**	**
HL20	0.442	0.409	0.033	0.472	
RSRR	0.279	0.199	0.079	**0.016**	**
SUSAVG	0.325	0.251	0.074	**0.025**	**
SUSTOTR	6.901	6.198	0.702	**0.119**	
Prop_Scheduled	0.064	0.105	-0.041	**0.029**	**
Prop_Nosdirgrants	0.381	0.390	-0.009	0.846	

* Control firms have same 4-digit primary SIC code and total assets within +/- 5% of the target firm.

BGP1 is the total of lucky grants that are issued at the lowest price of the calendar month of the option grant date divided by total grants over the sample period. *BGP2* is the total of lucky grants that are issued at the lowest three prices of the calendar month of the option grant date divided by total grants over the sample period. *NSS* is the total of lucky grants which post-grant returns are positive divided by total grants over the sample period, *HL2* (*HL20*) is the total of lucky grants which the differences in the 2-day (20-day) returns between the post-grant period and the pre-grant period is positive divided by total grants over the sample period. *RSRR* is the total of lucky grants which post-grant return is positive AND the pre-grant return is negative divided by total grants over the sample period. *SUSAVG* is the average of the six indices, while *SUSTOTR* is the total of the tercile ranks of the firm obtained when ranked on each of the six indices. *Prop_Nosdirgrants* is the number of outside directors who are issued grants the same day as the CEO divided by the total number of executives issued grants on the same day. A grant is scheduled when it is issued within 1 day of an option grant date in the prior year or if they are issued within 1 day of an option grant date in the subsequent year. *Prop_Scheduled* is the total of grants which are scheduled divided by total grants.