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AUTHORS	Jingyu Li Fayez A. Elayan Thomas O. Meyer Parunchana Pacharn

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Jingyu Li (Canada), Fayez A. Elayan (Canada), Thomas O. Meyer (USA),
Parunchana Pacharn (Canada)

The outcome of backdating investigations: economic consequences, market overreaction and management motives

Abstract

Prior studies on option backdating have focused exclusively on initial backdating investigation announcements. Our major contribution is to account for the investigation outcome which no previous study examines. The paper provides evidence on market overreaction to the initial investigation announcement. The authors find 48 percent of firms are unintentional backdaters and their stock price losses are largely reversed at outcome announcements. By not accounting for backdating outcomes previous studies overestimate backdating losses.

Keywords: backdating, employee stock options, corporate governance, overreaction.
JEL Classification: M41.

Introduction

Backdating occurs when a company retroactively changes option grant dates to dates on which its stock was trading at a relatively low price. Intentional backdating and an accounting report claiming the options have been issued on those dates as "at the money" rather than "in the money" may be considered fraudulent. Backdating can be intentional or unintentional, legal (if it is fully disclosed) or illegal and it could be undertaken for motives that are consistent with shareholder wealth maximization or for reasons motivated by management greed[1]. Our paper's purposes are two-fold. First, we investigate whether the market overreacts to backdating investigation announcements. Second, we examine the motives of management and boards of firms which were found to be intentional backdaters, a sample that was not examined before in extant literature.

Recent empirical studies on backdating practices have reached several conclusions. First, market response to a company's announcement that it has initiated or will initiate its own internal investigation for possible backdating is overwhelmingly negative (Narayanan, Schipani and Seyhun, 2006; Bernile, Jarrell, and Mulcahey, 2006). Second, backdating is motivated by management's opportunistic behavior (Bernile and Jarrell, 2009; Walker, 2007; Heron and Lie, 2007, 2009). Third, estimated gains to management are reported to be small (Narayanan et al., 2006). Fourth, backdating has little or no cash flow implication given that information in grant disclosures is sufficient for the market to calculate the actual value of the options (Bernile and Jarrell, 2009). These conclusions are seemingly contradictory and deserve further investigation.

The first contradiction is that the market response is so overwhelmingly negative at the initiation of backdating investigation for an event with little or no cash flow implications. Bernile and Jarrell (2009) establish that backdating has no cash flow implications because option compensation is a non-cash expense and its value can always be accurately determined as of the grant disclosure date and thereafter. In addition, employee stock option (ESO) grants typically have a vesting restriction period and cannot be exercised even if they are in-the-money, therefore preventing option holders from realizing the gain from backdating. Yet, Narayanan et al. (2006) report a negative eight percent abnormal return which is equivalent to a $510 million decline in market value over a 21-day announcement window. Similarly, Bernile et al. (2006) report an 8.91 percent decline which is equivalent to a $686 million average decline in market value over a 41-day announcement window. Conversely, the mean gain to chief executive officers (CEOs) from backdating is $0.60 million per firm per year, the mean (median) value of total options granted is $1.716 million ($1.032 million), the mean (median) value of total compensation to the CEO is $2.941 million ($1.819 million), and the mean (median) restatement of $96.97 million ($19.60 million)[2]. The total of these combined mean values is $102.23 million. Thus, Bernile et al. (2006) show that the magnitude of the combined mean dollar value negative response exceeds the mean dollar gains to these announcements by a factor of about 6.7 times.

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[1] Crimmins (2006), formerly of the Securities and Exchange Commission's (SEC) Enforcement Division, notes that backdating may not involve fraud or deception and the possibility that backdating occurs unintentionally or for other motives apart from self-serving management. He states that "It will be particularly interesting to see how the government handles situations where individuals did not knowingly violate the law or deceptively cover up their activities, where individuals lacked an understanding of the accounting and tax rules involved in option grants, where they relied on in-house or outside professionals to alert them to potential compliance issues and where problems stemmed from imprecision or outright sloppiness in tending to the formalities that drive the setting of grant dates" (pg. 1960).

[2] The mean amount of the restatement is reported in Table 2 of this manuscript. The other values reported are available from the authors.

The second contradiction is that the gain achieved by management through backdating reported in previous studies is so small that attributing this gain to opportunistic motives seems inadequate. For example, Narayanan et al. (2006) report that the average gain to management from backdating strategies is approximately $0.60 million per firm per year. This figure is based on the speculative assumption that the CEOs backdated their option grants on every grant date that backdating would have been profitable. In comparison to the negative stock market losses cited previously, this is a trivial amount. Despite this minimal personal gain to management, most previous studies have suggested that backdating is motivated mainly by management's opportunistic behavior. Our main contribution is to address these two contradictions.

Bernile and Jarrell (2009) and Walker (2007) point to the possibility of media bias in reporting the gains from backdating, while LaCroix (2007) suggests that there is a tendency for the media to portray many legitimate option-granting practices as "option backdating" and attribute the alleged backdating solely to management's greed, without differentiating between intentional and unintentional backdating. Our results suggest that the media portrayal of all firms initiating a backdating investigation as guilty is a principal factor causing the negative market reaction. The expected costs due to legal liability risk and increased leadership risk contribute to the negative market reaction, but only to a lesser extent.

Our analysis using the outcome announcements also allows us to address the second contradiction. Previous studies do not take into account that the outcome of the internal investigation may reveal that the alleged backdating was intentional, unintentional[1], or not backdating at all[2]. Combining the "innocent" firms (unintentional or no backdating) with the "guilty" (intentional backdating) makes an inferior research design in investigating what motivates backdating strategy. Intentional backdating is more likely to be associated with opportunistic behavior and is associated with serious legal and financial consequences as opposed to unintentional backdating. Therefore, we re-examine the issue of management motives by first identifying the intentional backdaters. This allows us to properly analyze the motives of management and boards involved. No prior study has addressed the motive issues with the sample of "true" backdaters. Note that this change in the research design may not be significant if most firms are intentional backdaters. However, we found that nearly half of the alleged firms were not intentional backdaters.

We first consider management opportunism as a motive behind intentional backdating in keeping with previous literature. Our findings do support management opportunism. However, we consider an alternative motive that backdating may provide economic benefits to the firm through reduced compensation costs and more efficient managerial incentives (e.g., Gao and Mahmudi, 2008). Our analysis supports this explanation as well.

The remainder of the paper is organized as follows. Section 1 describes the internal review process and discusses possible outcomes of a backdating investigation. Section 2 provides a review of the relevant literature. Section 3 describes the development of the hypotheses. Section 4 addresses the development of the data and describes the analytical methods employed. Section 5 discusses the empirical research findings. The final section provides a summary and conclusions.

1. The internal review: intentional, unintentional and no backdating outcomes

The internal review of backdating practices may be initiated voluntarily by the company's Board. Alternatively, it may be the result of an SEC notice or DOJ subpoena. The final report of the investigative committee will state whether intentional or unintentional backdating occurred. If necessary, the final report will provide the amount of the restatement, and other information.

Intentional backdating involves drafting or modifying the grant document to reflect a particular date that is associated with a more favorable (lower) exercise price. By modifying the grant document, the company conceals the fact the options were actually offered "in-the-money" and thereby have a built-in profit at the time of the grant. This change generates a charge against earnings and should be disclosed in the required filings. However, this information was generally not disclosed by intentional backdaters. Intentional backdating results in serious issues with the SEC and/or DOJ regarding possible fraud, improper disclosure, improper financial statements and inadequate internal controls. Additionally, significant legal issues may arise in connection with falsifying option documents and may well undermine management credibility.

[1] Grant-date backdating could be undertaken for innocent reasons (e.g., to provide equity for recently hired employees when stock prices are volatile) that did not consider negative accounting and tax complications. Backdating does not mean that securities laws have been violated. Purposefully backdated options that are properly accounted for, and do not run afoul of the company's public disclosure rules, are legal. Similarly, there is no legal issue if backdating results from an administrative paperwork delay.

[2] Therefore, these studies implicitly assume that management of companies announcing the initiation of an internal investigation or those that become subject to an SEC and/or DOJ investigation are guilty of intentional backdating or that there is a high likelihood they are guilty.

Unintentional backdating essentially results from carelessness or from practices borne of convenience in option granting and accounting procedures. For example, a compensation committee may meet without the mandated advance preparation as to who is to receive the option grants and the amount – leaving the decision up to the CEO or the chair of the compensation committee with the options priced at the meeting-date stock price. A company may adopt a policy of making a grant to all new hires on the last day of their hiring month, where the grant date is set to coincide with the lowest price during that month. The SEC has shown sympathy for these situations and has distinguished these cases from intentional backdating.

2. Literature review

Yermack (1997), Aboody and Kasznik (2000) and Chauvin and Shenoy (2001) document the systematic, favorable, V-shaped stock-price pattern surrounding option grant dates. They attribute such behavior to "good timing" of information flow. However, Lie (2005) and Heron and Lie (2007) propose the "backdating hypothesis" as an alternative explanation. Lie (2005) shows that employee stock option (ESO) awards occurred on a date where the stock price had shown negative abnormal returns before the grant date and positive abnormal returns afterwards. The plausible explanation is that option grants were awarded ex-post on a day where the share price, and thereby the grant-date exercise price, was relatively low. Heron and Lie (2009) report that 13.6% of all option grants to top executives during the period of 1996-2005 were backdated or otherwise manipulated.

Studies by Narayanan et al. (2006), Heron and Lie (2007, 2009), Bizjak, Lemmon and Whitby (2009) and Collins, Gong and Li (2009) try to answer the question of what motivates management to be involved in backdating. Their evidence indicated backdating was carried out with the intent of deceiving and defrauding shareholders to enhance CEOs' compensation. Narayanan et al. (2006) find that for 47 firms implicated or under investigation for backdating, an average market value of $510 million is lost per firm during the 11-day announcement window. The average gain to executives from backdating is found to be $600,000 per firm per year. Similarly, Bernile et al. (2006) examine the market reaction to backdating announcements for 110 companies. They find shareholders of these companies suffer a significant decline in equity ranging from 20 to 50 percent, which translates into $100 to $250 billion of market equity. Conversely, the resulting gains to management from backdating amount to 0.80 percent of the firm's equity value and are therefore negligible. Becker and Lu (2006) report a 4.91 percent decline in market value over a seven-day event window for 83 companies accused of backdating stock options. Essentially, these three studies suggest that the potential benefit to executives from clandestine backdating is minuscule compared to the damage to shareholders at the revelation of this activity.

Bernile and Jarrell (2009) note that the effect of backdating on cash flows is not uniformly negative or material and the out-of-pocket costs are relatively small. They suggest that management's involvement in option backdating may cause investors to reassess the agency costs. They find that surprisingly, this leads to a negative reaction beyond any reasonable estimate of the out-of-pocket costs. These authors indirectly assess backdating outcomes by examining the effects of restatements on shareholder losses and the likelihood of these firms becoming takeover targets. While most studies focused on management opportunism, Walker (2007) observes that backdating may serve as a method used by management to conceal the actual value of their options in order to justify options on more shares. He argues that backdating may have been an excellent method of delivering stealth executive compensation. If the number of options granted is based on the calculated Black-Scholes' (1973) value of the options, backdating will result in a larger number of options granted and thereby more valuable option grants[1].

Gau and Mahmudi (2008) use an efficient-contracting framework to argue that backdating is an effective approach to increase managerial incentives and reduce compensation risk for managers that are both under-diversified and risk-averse. By making their options in-the-money, backdating achieves this end without losing the accounting and tax benefits of issuing at-the-money options. Wu (2008) finds that firms being investigated for backdating are larger, younger, have lower cash holdings and higher stock volatility. In addition, she finds little evidence to support managerial entrenchment and underperformance. Wu concludes that backdating is rational and cannot totally be attributed to lucky or greedy executives.

[1] Walker (2007) develops a numerical example showing how backdating reduces the *apparent* value of an option to a lower *actual* value. Specifically, he uses ceteris paribus analysis to calculate Black-Scholes (B-S) option values for two options differing only on the basis of the actual grant-date stock price with the following parameters: $40 strike price; five-year expiration; 80 percent annual volatility; and a three percent risk-free rate. If the stock price is $50 then the option's apparent value is $34.77. However, if the option is backdated to a point where the actual stock price was $40 then the actual B-S option value is only $26.25. If an executive or employee were granted $1 million of options, they would receive 28,760 options based on apparent value and 38,095 options based on actual value.

The key difference between the study here and these other studies is that they only examine corporate behavior around option grant initiation dates. Our study examines share price behavior around both the internal investigation initiation announcement and the subsequent investigation outcome announcement.

No previous studies have explicitly examined market overreaction to backdating outcome announcements. Overreaction refers to an excessive reaction to information which can be followed by a later reversal (Kaestner, 2006). Prior finance literature has documented the existence of market overreaction and reversal in various situations, markets, and time periods (e.g., DeBondt and Thaler, 1985; 1987; Bremer and Sweeny, 1991; Michaely, Thaler and Womack, 1995; Daniel, Hirshliefer and Subramanyam, 1998; Poteshman, 2001; and Kaestner, 2006). More relevant to the research here, Thomas and Zhang (2008) document an overreaction to intra-industry information. In their words, "the stock market overestimates the intra-industry implications of early announcers' earnings for late announcers' earnings, and that overestimation is corrected when late announcers disclose their earnings" (pg. 909). Sunstein and Zeckhauser (2010) examine "probability neglect", a form of decision bias that may cause overreaction. This bias is a response to risks that stimulate strong emotional responses such as fear, anxiety or outrage. When an individual faces such risks, the benefits of risk-reducing, or ameliorative measures are exaggerated. Experiments have shown that people will be insensitive to probability when they pay a premium to eliminate those risks. If option backdating is perceived as management opportunism and therefore creates emotional outrage, investors may overreact to the initial announcement and fail to assess the proper probability of a guilty outcome.

3. Development of testable hypotheses

This section develops testable hypotheses around two announcements, the internal investigation announcement and the outcome announcement. This section also develops testable hypotheses as to what motivates intentional backdating. Finally, this section explains a set of control variables to capture announcement effects as well as firm characteristics that are important to the analysis.

3.1. Market overreaction to backdating announcements. The fact that a company has either initiated its own internal investigation or has become subject to a formal or informal external investigation by the SEC and/or the DOJ alerts investors that the outcome of the investigation may produce findings with adverse consequences on the firm's value. This concern becomes obvious given the fact that there is a positive probability that the firm will be found guilty of intentional backdating. However, since the outcome of the investigation is unknown, the inability of investors to differentiate correctly between guilty and innocent firms may cause investors to follow the precautionary principle that it is "better to be safe than sorry". Thus, contrary to the legal presumption of innocence, the market may react as if backdating-firm management is guilty. Investors may overreact and assign a higher probability of guilt (or larger expected costs) to companies initiating an internal investigation than the actual expected probability of guilt (or expected costs). Such overreaction would prompt investors to discount the firm's value to reflect their joint assessment of the probability of a guilty outcome and the increase in litigation, management departure, and regulatory intervention risk (Sunstein and Zeckhauser, 2010). A consistent occurrence with this is a "large" negative response at the time of the investigation announcement and this leads to development of our first testable hypothesis.

H1a: The announcement period Cumulative Average Abnormal Return (CAAR) for companies that are initiating an internal investigation of possible backdating is expected to generate a negative and significant equity market reaction.

Hypothesis H1a, although consistent with overreaction, is not sufficient by itself to support evidence of overreaction. It is critical that the market response to the outcome of the investigation announcement is examined in order to test our market overreaction hypothesis. Specifically, if the negative market response to the initial investigation announcement reflects investors' overreaction due to a higher probability of guilt and assessment of litigation, leadership and regulatory-intervention risk, then an outcome announcement of unintentional or no backdating would eliminate or substantially reduce such risk. This outcome would cause investors to revise or reverse their previous assessment. As such, the market response to these findings should be positive and largely offset previous losses for the non-guilty firms. We construct the following additional hypotheses based on the possible outcomes of the investigation.

First, the investigation may conclude that the company is "innocent" and is either not guilty or that the backdating is unintentional. In these cases, investors are expected to revise their initial assessments and the market response is expected to be positive and largely offset the initial negative market response, which will be consistent with market overreaction.

H1b: Outcome announcements stating that there was no backdating, or it was unintentional, are expected to engender a positive and significant market reaction.

Second, the investigation may reveal that the management and/or the board are "guilty" of intentional backdating and confirm investors' previous assessments and the market response is expected to be neutral.

H1c: Outcome announcements stating that management has been involved in intentional backdating are expected to generate an insignificant market reaction.

3.2. Determinants of market response to backdating. To provide further insight on market overreaction we examine the determinants of the market response to the investigation announcements and the possibility that investors assesses a high probability of a guilty outcome and high estimates of an increase in various risks. A significant negative relationship between proxies for litigation, leadership and regulatory risk and the announcement-period *CAAR* will be consistent with the investor-overreaction argument. This suggests that (regardless whether the backdating outcome is intentional, unintentional, or no backdating) the market perceived these firms are likely to be guilty.

We utilize the number of backdating related lawsuits (*NSUITS*) to proxy for litigation risk. The larger the number of lawsuits filed against the company, the higher the direct and indirect legal costs and the more negative the market reaction to the backdating announcement. This logic suggests a negative relation between *NSUITS* and *CAAR*. The second proxy is a dummy variable (*DRESIGN*) that represents leadership risk and/or management departure. It equals one if one or more members of the original management team either resigned or are fired or relocated, and is zero otherwise. Empirical evidence by Dahya, McConnell and Travlos (2002) and Fee and Hadlock (2004) suggests that management departure or resignation is negatively related to firm performance. Backdating announcements revealing that management are being fired or are resigning are expected to be associated with greater negative market reaction[1]. This relation suggests a negative sign between the (*DRESIGN*) variable and the *CAAR* variable in the cross-sectional regression model. The third variable (*DSELF*) is a proxy for regulatory intervention risk. *DSELF* is a dummy variable equaling one if the firm initiated its own internal investigation and zero if either the SEC or DOJ initiates the investigation. Firms may believe that self-initiation of an internal investigation allows them to minimize the damage to stock prices through aggressive self-policing. Since these firms are effectively policing themselves, market reaction to their backdating announcements should be more positive (or less negative) to these announcements. Therefore, the sign of the *DSELF* variable is expected to be positive in the cross-sectional regression.

The extent and intensity of media bias in the coverage of bad news and how it may affect investor perceptions and market reaction to backdating announcements is also examined. Bagnoli, Clement and Watts (2006) and Kaniel, Starks and Vasudevan (2007) suggest that bias in media coverage affects investor behavior and that media coverage of bad news dominates the coverage of earnings announcements. Being suspected of backdating is bad news and backdating companies become subject to intense media scrutiny. Anecdotal evidence suggests that similar disclosures made prior to the recent media spotlight on option backdating did not lead to market reactions as large as those found in this study. The proxy for media coverage (*MEDIA*) is calculated as the number of articles related to the company's backdating news divided by the number of all articles related to the company that are found on the Internet. So higher values indicate, greater intensity of backdating coverage by the media. In the cross-sectional model, higher *MEDIA* values are expected to be associated with a more negative market reaction.

3.3. Management and board opportunism motives vs. internal controls. Analysis is also specifically focused on the intentional backdaters as no prior study has addressed the motive issues with this sample before. First, we consider management opportunism as a motivation behind intentional backdating. Recent evidence provided by Bartov and Mohanram (2004), Bergstresser and Pillipon (2006), Burns and Kedia (2006) and Cheng and Warfield (2005) suggest that managers with significant wealth tied up in the firm's stock and options have more incentive to be involved in option backdating and other short-term strategies enhancing the value of their options and total compensation[2]. We hypothesize that these firms are more likely to backdate. To proxy for management opportunism we calculate the Black-Scholes (1973) fair-market value of options granted divided by total compensation (*BSVTC*) and the percentage of shares and options held manage-

[1] On the other hand, investors may view the departure of executives involved in backdating as a step in the right direction in eliminating inefficient, self-serving executives.

[2] The search covers the period from 30 days before to one day after the backdating announcement.

ment and board (*PSHROWN*). Under this hypothesis a positive sign is anticipated between *BSVTC*, *PSHROWN* and the likelihood to backdate.

However, management opportunism is limited by effective governance and internal control system. McConnell (2006) notes that one of the common characteristics of backdating firms is having internal control weaknesses. Ashbaugh-Skaife, Collins and Kinney (2007), Doyle, Ge and McVay (2007) and Beneish, Billings and Hodder (2008) find that disclosing material weaknesses is informative to the capital market[1]. Companies with weak corporate governance structure and defective internal control system are more likely to backdate. We construct a composite index (*CINDX*) based on two indices to proxy for corporate governance strength. First described by Bebchuk, Cohen and Ferrell (2009)[2] high values of the entrenchment index (*EINDX*) indicate greater entrenchment while larger values of their corporate governance index (*GINDX*)[3] indicates better governance. Our *CINDX* is constructed to equal one if the company has both an above-median *GINDX* and a below-median *EINDX* and is zero otherwise. This approach is used to capture the most information from these two indices. Companies with an effective governance structure should be less likely to backdate. Thus, a negative relationship is anticipated between *CINDX* and the likelihood to backdate in the logistic regression. To proxy for internal control deficiencies we utilize a dummy variable (*DWEAK*) equal to one if the company discloses material weaknesses over the three-year period preceding the announcement year for both the backdating firms and the matching group[4]. A positive relationship is anticipated between the material weakness variable and the likelihood to backdate in the logistic regression.

3.4. Economic-benefits hypothesis. Contrary to the management opportunism explanation, Gao and Mahmudi (2008) argue that backdating is an effective strategy to reduce the risk of compensation contracts and increase managerial incentives for risk-averse and under-diversified managers. Their argument is based on the assumption that the optimal strike price for option grants is usually below the grant-date share price and backdating is one way to achieve the optimal strike price and effectively attain at-the-money options. In addition, Walker (2007) suggests that backdating might be associated with economic benefits such as retaining highly-skilled and talented employees, increasing employee morale and leveling the playing field between employees hired in rapid succession[5]. We utilize pay-performance-sensitivity of option grants (PPSOG) as a proxy for this argument. Stock option delta measures the sensitivity of option value to underlying stock price changes. PPSOG is measured as the percentage of the firm's stock on which options are written multiplied by the options' deltas. To estimate option deltas, the "one-year approximation" approach[6] developed by Core and Guay (2002) is utilized. Backdating is an action which places ESOs in-the-money, increasing their deltas and thereby the sensitivity of options to performance. If backdating is associated with increased employee morale and incentives, then it should lead to better performance. Thus, a positive relation is expected between PPSOG and backdating likelihood in the logistic regression.

3.5. Control variables. The number of options backdated (*NOBD*) relative to the total number of common shares outstanding captures the extent of options backdated. Higher values of *NOBD* reflect the severity of the backdating and a negative relation is anticipated between *NOBD* and the *CAAR*. Management may have backdated to avoid reporting option expenses in their income statements and to enhance reported earnings[7]. However, discovery of

[1] A material weakness is defined as "A significant deficiency or a combination of significant deficiencies that results in a more than remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected" (Public Company Accounting Oversight Board, 2004, Appendix 10).

[2] The entrenchment index is based on six provisions that are a subset of twenty-four governance provisions tracked by the Investor Responsibility Research Center. Bebchuk, Cohen and Ferrell (2009) find this subset of provisions to be highly correlated with firm value and shareholder returns.

[3] This composite index is utilized to incorporate information beyond that contained in each index individually (as the correlation between *EINDX* and *GINDX* is -0.846). Further, in unreported results, the regression models are estimated using the individual indices. This analysis indicates that the results are robust with regard to the addition of either the corporate governance or the entrenchment index to the composite index.

[4] The data were obtained by searching Item II 9-A on the SEC's Form 10-K and Item I4 on Form 10-Q entitled "Controls and Procedures" for material weaknesses.

[5] Microsoft and Micrel Inc. have, in fact, admitted to utilizing the technique of backdating for retention purposes (See for example, Charles Forelle & James Bandler (2006). "During 1990s, Microsoft Practiced Variations of Options Backdating", *Wall Street Journal*, January 16, 2006, pg. A1; David Reilly (2006). "Moving the Market: Micrel Says Deloitte Approved Option-Pricing Plan", *Wall Street Journal*, June 1, pg. C3).

[6] This approach requires information from only the most recent proxy statements. It avoids the cost and difficulty of collecting option data from various proxy statements. Furthermore, Core and Guay (2002) suggest this approach is unbiased and 99% correlated with the measures that would be obtained if the parameters of a CEO's option portfolio were completely known.

[7] See, for example, the case of *SEC* v. *Reyes* in which the SEC alleges that executives at Brocade Communications Systems falsified paperwork to avoid recording option expenses (Charles Forelle, 2006). "Brocade Ex-CEO, 2 Others Charged in Options Probe", *Wall Street Journal*, July 21, pg. A1).

backdating may require companies to restate their financial statements reflecting that the backdated options were granted in-the-money. As such, the intrinsic value of the options needs to be treated as a compensation expense that lowers reported earnings. The ratio of the restatement amount to market value of equity (*AMTEQ*) is employed to capture the effect of the restatement. If investors are focused on reported earnings and not on the actual cash-flow, then a negative relation is anticipated between *AMTEQ* and the *CAAR*. High tech companies (*HITECH*) tend to overweight the option percentage in their compensation structure to secure the type of entrepreneurial talent desired in a high leverage risk-reward relationship. These companies are more likely to backdate to increase managerial incentives. Thus, a positive relation is anticipated between *HITECH*[1] and the likelihood to backdate. Furthermore, given the heavy reliance on options by high tech companies, the announcement of the internal investigation is expected to have a more negative impact (a negative relation to the *CAAR*) for these firms. To ensure our results are not driven by certain firm characteristics we also control for firm size (*SIZE*) measured as the natural log of total assets. Firm growth opportunities are also used as a control variable. This is measured by the market value of total assets divided by the book value of total assets (*M/B*). Market value of total assets is calculated as the book value of total assets minus the difference between market and book value of equity. Finally, firm historical performance is proxied by the return on equity (*ROE*) and it is measured as operating income before depreciation divided by market value of equity.

4. Data description and methods of analysis

The preliminary sample of firms announcing an internal investigation of backdating practices was obtained from the Wall Street Journal (WSJ), which keeps an "Options Scorecard" list of alleged backdating firms[2]. It was supplemented by searching the Factiva database, the Internet and the websites of major law firms tallying alleged backdating firms. The period covered is from January 1, 2004, through December 31, 2007. Four procedures are utilized to develop the initial sample of 156 firms. First, the company backdating announcement event is defined as the first date the firm reported initiation of either an internal investigation regarding a backdating probe, receipt of an informal/formal inquiry letter from the SEC, that it is under SEC investigation, or that it received a DOJ subpoena. Second, the Factiva database and the company's website news archive were searched for the exact announcement date to ensure correct determination of the first public announcement. Third, the Factiva database was searched for confounding events such as earnings announcements, share repurchases, mergers or acquisitions[3], etc., within the five-day window, from two days before, until two days after, the announcement day. Such announcements were dropped from the analysis.

Fourth, the announcement date for each company is tracked forward until December 31, 2007. The outcome of the internal investigation versus the SEC/DOJ findings are a critical element of our research. The news archive section of each company's website and the Factiva database was searched to determine the outcome and findings of the investigation and whether backdating had occurred. Each firm is monitored from the internal review initiation announcement until the investigation committee issues its final report. The reports find one of three possible outcomes, i.e., no backdating, unintentional backdating or intentional backdating. Further, this determination addresses whether the company restated their financial statements and what was the amount of restatement? Additionally, did management team members resign or were any fired or relocated? Finally, what was the number of individual lawsuits and class-action lawsuits initiated against the company?

These procedures produced a final sample of 136 unique firm announcements with returns available from the Center for Research in Security Prices (CRSP) and company data available on COMPUSTAT. A matched sample of 136 non-backdating, comparison group firms is constructed to perform univariate and multivariate comparisons. Firm matching is based on the first four digits (108 matching), three digits (22 matching) and two digits (6 matching) of the SEC code and firm total assets as a size proxy.

Table 1 provides a frequency distribution of sample characteristics for the final sample of 136 announcements of possible backdating of ESOs. The analysis shows that 63.9 percent of the sample is considered to be *HITECH* firms. This percentage represents a high degree of concentration for this group. By comparison, *HITECH* firms account for less than 10 percent of all companies traded on US

[1] The *HITECH* proxy is constructed as an indicator variable equal to one if the company is in the high-tech sector and is zero otherwise. The coding is based on the North America Industrial Classification System (NAICS) and by examining the type of business description as reported in the company's SEC filings.

[2] http://online.wsj.com/public/resources/documents/info-optionsscore 06-full.html is the website for the WSJ's list of suspected backdating firms.

[3] Three companies were acquired before the company-specific announcement (acquirer in parentheses). These firms are Engineered Support Systems (DRS Technologies), Renal Care Group (Fresenius Medical Care) and Pixar (Walt Disney Co.). In addition, Microsoft Corp. was eliminated because the issue of backdating had been disclosed as far back as 1999.

stock exchanges. This finding is consistent with the idea that *HITECH* companies grant more options in order to attract, retain and motivate their employees. The discovery of backdating requires the restatement of previous financial statements to adjust for the cost of the options[1]. Table 1 (see Appendix) shows 73.5 percent of firms RESTATED the previous years' financial statements. Table 1 also provides OUTCOME information and shows that in 19.1 percent of cases (26 firms) the investigation reveals no backdating (NB) evidence. Further, 28.7 percent of the firms were found to have backdated unintentionally (UB). Finally, in 52.2 percent of the cases (71 firms) the management was determined to have intentionally backdated (IB). This evidence shows that 47.8 percent of firms are not found to be intentional backdaters. Thirty-five percent of backdating companies experience management departure in the form of resignation (*RESIGN*). All 136 firms initiated an internal investigation. Forty-three firms (31.6 percent) initiated their own (SELF initiations) internal investigation without provocation. Thirty-nine of the remaining 93 firms (41.9 percent) were provoked into their investigation by the SEC-only (SEC), by either a letter of inquiry and/or requests to provide information about option grants, etc[2]. Four firms (4.3 percent) were provoked by a DOJ-only investigation (DOJ). Fifty of the 93 firms (53.8 percent) were induced to initiate their internal investigations by a joint (JOINT) SEC/DOJ action. Thirty-eight percent of the companies had material weaknesses (MW). Furthermore, 233 lawsuits (*NSUITS*) were filed against the firms in the sample, or 1.7 lawsuits per firm.

Table 2 (see Appendix) reports univariate analysis results for significant mean differences between explanatory variables for backdating firms versus a matching sample of no backdating firms as well as between intentional and unintentional or no backdating firms. The results from this analysis, and the following tables are discussed in section 5.

Abnormal returns around initiation of the investigation and outcome announcements are estimated using the Fama-French (1993) three-factor model as the return-generating process. This model controls for firm size and the differential risk factor between firms with high versus low and market-to-book equity-ratio values. The average abnormal return (*AAR*) is calculated using an ordinary least squares (OLS) regression using 150 daily returns from trading day t = -210 through trading day t = -61, relative to day 0, the announcement date. The AAR for event date t is calculated as a simple cross-sectional average over the N firms in the sample. The event window is the three-day period (t-1 to t+1) *CAAR* and it is expected to capture the backdating announcement market reaction. Both the rank z-test as developed by Corrado (1989) and the jackknife z-test developed by Giaccotto and Sfiridis (1996) are utilized to test for the significance level of the *AAR* and *CAAR*. The jackknife z-test (JNZ) improves upon the standard t-test because it adjusts for event-induced, transient changes in variance. Specifically, if an announcement changes the return's variance during a specific day, return standard deviation is a biased estimator. The jackknife z-test adjusts for this potential problem[3].

A logistic regression is used to examine factors differentiating backdating firms from comparison non-backdating firms. The analysis provides evidence on the motivation and characteristics of backdating practices. The results are presented in Table 4. A cross-sectional regression model is employed to examine the determinants of market reaction and to differentiate between the competing hypotheses. The dependent variable is the announcement period Fama-French *CAAR*. The definition of variables and anticipated sign for each proxy variable has been provided previously. The multivariate regression model is presented in Table 5 (see Appendix) along with results of model estimation.

5. Empirical results

5.1. Univariate test results. Univariate test results for significant differences between the means of backdating firm explanatory variables versus the comparison matching group as well as between intentional (IB) and unintentional/non-backdating (UINB) firms are shown in Table 2 (see Appendix). The variables utilized (or closely related to them) are those in the cross-sectional and logistic regression analysis. The results described are those cases where mean differences (*Mean Diff*) are found to be significantly different from zero. Top executives of backdating firms are found to have a higher proportion of their compensation in the form of stock options (*BSVTC*) relative to the matching firms. Further, these executives (and board mem-

[1] Backdating implies that the company originally accounted for these options as being at-the-money options. This does not require recognition of the fair-value option grant under the Financial Accounting Standards Board (FASB) 123 regulation. The relevant issue is that after backdating, these grants turn out to be in-the-money. In-the-money option grants require recognizing the fair market value of these grants as an expense on the income statement.

[2] This, and the following two percentages are calculated as a percentage of the Non-Firm Initiations. They are not shown in Table 1 so the percentages there total to 100 percent for these two related categories.

[3] In addition to return analysis, the announcement effect on daily relative trading volume is examined. This analysis is similar to the returns analysis, but the log-transformed relative volume replaces the daily rate of returns, which is similar to procedures conducted by Campbell and Wasley (1996).

bers) hold a higher percentage of shares and options (*PSHROWN*) in their firms. Mean differences for both variables are significant at the one percent level.

Mean differences for backdating firms are significantly lower on the corporate governance index (*CGINDX*), higher based on the entrenchment index (*EINDX*) and higher on the composite index (*CINDX*) compared to the matching group. Further, backdating firms have more material weaknesses (*DWEAK*), and are followed by a larger number of analysts (*ANALYST*) relative to the matching group. Mean differences comparing the two samples for each of these variables (except *ANALYST*) are significant at the one (ten) percent level. These results suggest that backdating firms have a higher proportion of options in their compensation structure and less effective corporate governance, but are subject to greater scrutiny compared to their peers. These situations may have served as environments that fostered backdating practices.

Table 2 also shows that backdating firms grant more options to their employees (*PCTEMP*) than to their top five executives when compared to the matching group. The mean difference of 0.046 is significant at the one percent level. In addition, backdating firms have a higher pay for performance sensitivity of option grants (*PPSOG*) relative to the matching group. The mean difference of 0.397 is significant at the five percent level. These results suggest that backdating may serve as a motivational tool to increase performance for companies with higher *PCTEMP* and sensitivity of *PPSOG*.

Intentional backdating firms have significantly lower values of both the *CGINDX* and *CINDX* and significantly higher values of the *EINDX* and *DWEAK* variables at the one percent level. These results suggest that intentional backdating firms have weaker corporate governance structures, suffer more from entrenched governance and exhibit greater material weaknesses. Further, intentional backdaters have a higher average restatement amount (AMT) of $165.369 million relative to $22.252 million for companies with no, or unintentional backdating. The mean difference of $143.117 is statistically significant at the one percent level. This difference principally reflects the fact that UINB companies either do not need to restate their financial statements or the restatement amount is much smaller. This finding is reinforced by the *AMTEQ* variable being similarly, statistically lower for UINB firms. Further, greater management departure (*DRESIGN*) and a higher number of lawsuits (*NSUITS*) are associated with intentional backdating companies. All of these differences are significant at the one percent level. Lastly, IB firms have lower growth opportunities as evidenced by significantly lower *TOBQ* and they tend to belong to the *HITECH* industries. The mean differences between IB and UINB for these two variables are significant at the five percent level. Collectively, these results clearly point to the importance of differentiating between intentional and unintentional backdating based on the investigation outcomes.

5.2. Market response to the initial investigation and the subsequent outcome. Table 3 reports the market reaction to the initial investigation announcements and the internal review outcome announcements. Segregation of the initial announcements into intentional, unintentional, and no backdating is based on the subsequent outcome. The three-day initiation announcement-period CAAR for the total sample is -3.75 percent. This result is significant at the one percent level based on the jackknife z-test statistic. The decline translates into a (cumulative) average change in market value (*ACMV*) of 20 - $192.96 million per firm over the three-day window[1]. The average market value loss of $192.96 million is nearly twice the average restatement (AMT shown in Table 2) of $96.967 million (median of $19.60 million). It greatly exceeds the mean (median) of the value of options granted (*OPTVAL*) of $1.716 million ($1.032 million), and it similarly exceeds the mean (median) value of total compensation to the CEO (*CEOTC*) of $2.941 million ($1.819 million)[2]. These results suggest that financial-reporting motives, the presumed negative impact of restatements on reported earnings. Thus, the management private-benefits hypothesis cannot account for, or explain, a decline of $192.96 million per firm in equity value. These results are consistent with hypothesis (H1a) and the market overreaction argument, suggesting that investors assign a higher probability of guilt to companies announcing the initiation of an internal investigation.

Market reaction to the outcome announcement for the total sample is positive (0.447 percent) but it is not significant. However, different results are obtained when the sample is categorized based on investigation outcome. Announcements of unintentional (labeled result 1.3), or no backdating (result 1.4), are associated with positive, significant market

[1] The results of (unreported) volume analysis confirm the return analysis. They show that the three-day cumulative average abnormal relative volume (*CAARV*) increase of 65.12 percent for backdating firms (relative to the volume for the all-CRSP-securities comparison index) is statistically significant at the one percent level. These volume results indicate that the price decline occurs in the presence of significantly higher volume for backdating firms. Thus, the observed return is not likely to be spurious or transitory.

[2] These results are reported here rather than in a separate table in the interest of brevity.

reactions (*CAAR*s) of 1.431 percent, and 1.594 percent, respectively. These positive reactions almost offset the negative reactions associated with the initial investigation announcements, both in terms of returns and in dollar value (as reflected in results 2.3, 2.4 and 2.5 of the lower panel of Table 3). These results are consistent with hypothesis H1b and provide direct support to the market overreaction hypothesis where investors revise their prior assessment upward to correct for initial overreactions of an increased risk of a guilty outcome. For intentional backdating companies, the outcome market reaction is negative (-0.410) and insignificant. These results support hypothesis H1c and provide further evidence reinforcing the market overreaction argument. Essentially, the market's assumed initial guilty verdict for all firms is only borne out for the guilty firms.

A very important result for this research is evidence in Table 3 showing that the market reacts negatively to the initial investigation announcement in the absence of cash flow implications and when the gain from backdating strategy is insignificant. Further, the differential reaction results (IB vs. UINB) suggest previous studies have effectively rendered premature judgments that all companies announcing internal investigations have backdated intentionally. Most importantly, this research finds that 48 percent of firms initiating a backdating investigation were either uninvolved in backdating or the backdating was unintentional. The evidence here clearly suggests that by not accounting for investigation outcomes previous studies overstate backdating economic impact.

5.3. Logistic regression analysis of management motives for backdating. Table 4 (see Appendix) presents the logistic regression results examining the factors differentiating intentional backdating firms from the comparison group of non-backdating firms. This examination is conducted to offer evidence regarding management motives for backdating. Table 4 details the specification of the logistic regression model, the definition of the variables serving as proxies for each hypothesis, as well as the predicted signs of each variable. The logistic regression analysis suggests that companies with higher percentages of options to total compensation (*BSVTC*) and (in Model 4) a higher percentage of shares and options held by management and boards (*PSHROWN*) are more likely to backdate to enhance their private benefits. The parameter estimates for *CINDX*, and *DWEAK*, are negative, and positive, respectively, and significant at the one percent level. This indicates that companies with weak corporate governance structure and defective internal financial-reporting control systems are more likely to be involved in backdating. The two proxy variables for the economic-benefits hypothesis, *PPSOG* and *PCTEMP* are significant and have the predicted positive signs. This is consistent with firms choosing to backdate options in an effort to increase managerial incentives and supports Gao and Mahmudi (2008). Belonging to the HITECH industry for backdating firms is not found to be a significant predictor of backdating. This is actually reassuring regarding the construction of the matching sample, since the comparison firms are supposed to represent a similar non-backdating firm. The regressions' pseudo R-squares, which may be interpreted as traditional R-squares, range from 0.187 up to 0.220, and the regressions therefore exhibit reasonable levels of predictive ability.

5.4. Cross-sectional regression analysis. Table 5 (see Appendix) reports the results of the cross-sectional regression analysis. The dependent variable is the three-day initial investigation announcement period *CAAR*. Management opportunism is not supported by the cross-sectional regression results, as the *BSVTC* and *PSHROWN* variables are not significant. The parameter estimates for *CINDX*, *DWEAK* and *ANALYST* are all significant at the one percent level and have the predicted signs. For lower *CINDX* companies (ranking both lower (higher) on corporate governance (entrenchment) indices), with greater material weaknesses and subject to less analyst scrutiny there is a more negative market response. These results are consistent with the hypothesis that the initial backdating investigation announcement causes the capital market to perceive these companies as having weaker corporate governance, less effective internal controls and less analyst attention prior to the initiation announcement.

Two market-overreaction proxy variables, the *DRESIGN* proxy for management departure/leadership risk and *NSUITS* litigation risk proxy are negative and statistically significant. These results suggest that backdating announcements reflect the expected costs associated with legal liability and management departure or dismissal. *DSELF* is positive, but it is only significant in Model 2. This result provides only marginal support for a differential market reaction between self-initiating companies relative to investigations initiated by the SEC and/or the DOJ.

The *MEDIA* parameter estimate is negative and statistically significant, as expected. This result suggests that media bias of backdating as a bad news event contributes to the negative market reaction even for companies that are subsequently exonerated by the company's internal review. This in turn, accords with the market overreaction argument. The *PCTEMP*, and *PPSOG*, parameter estimates are positive as predicted; however, their levels are mar-

ginally significant (in Models 2 and 3). These results provide only limited additional support that firms backdate to increase managerial and employee incentives. *HITECH* is negative and statistically significant at the one percent level suggesting that high technology backdating firms are associated with a stronger negative market reaction to backdating initiation announcements. Furthermore, *NOBD* is negative and significant at the five percent level in Model 2. This suggests that the larger the number of backdated options the more negative the market response to backdating announcements. Models 2 and 3 exhibit an impressive explanatory power with adjusted R-squares ranging from 46.30 to 53.00 percent. Additionally, the explanatory and dependent variable relationship does not appear spurious, as all F-test values are significant at the one percent level.

5.5. Statistical insights into backdating cases subject to SEC and/or DOJ actions. We examine the extent and the implications of the SEC and DOJ enforcement actions to provide further insight on the economic consequences of backdating. Table 6 provides summary statistics and case characteristics for 27 firms subject to enforcement actions by the SEC, DOJ or both. It reports the frequency and title of the defendant, the nature of charges brought against the company, settlement types and monetary settlement statistics. The results by defendant show that the Chief Executive Officer (*CEO* = 59.3 percent), Chief Financial Officer (*CFO* = 55.6 percent), and the General Counsel (*GC* = 33.3 percent) are the predominant defendants. Further, securities fraud (100 percent) and false SEC filings (18.5 percent) are the predominant charges. Further, the charge-settlement results indicate that 19 firms (70.4 percent) agree to pay a civil monetary penalty. For 15 firms (55.6 percent) the defendant accepted a five-year, 10-year, or permanent ban on acting as an officer or director of public company. Thirteen firms (48.1 percent) accepted the disgorgement of ill-gotten gains from backdating, and 12 (44.4 percent) accepted prejudgment of interest.

The mean (median) monetary settlement is $6.73 ($3.10) million excluding United Health Group Inc. (UHG) since it is an outlier in which the settlement reached $470.02 million. Furthermore, 14 out of the 20 firms were ordered to pay a monetary settlement with an average settlement amount of less than $4.1 million. Only three firms have a settlement amount exceeding $30.12 million. Furthermore, in untabulated results, we utilize the press release by the SEC/DOJ as the announcement date for the 42 cases of enforcement actions against the 27 companies to examine the equity market reaction. The three-day announcement period, *CAAR* for the total sample of 42 announcements is a positive 0.580 percent which is not statistically significant. We thereby conclude, given the relatively small number of companies that become subject to enforcement actions by the SEC and/or DOJ, the typically small monetary settlements (with the exception of 24 United Health Group Inc.) and the insignificant market reaction to enforcement action announcements that previous studies overestimate the economic impact of backdating.

Summary and conclusions

Firm announcements of the initiation of internal investigations into possible backdating practices have led to adverse publicity from the media as well as negative pronouncements from academics regarding the economic effects and motivation of those involved. Recent empirical evidence concludes that backdating is motivated principally by management opportunism and it is associated with a significant negative valuation effect. Strangely, the gain to executives from backdating activities turns out to be relatively trivial and further, is not found to be significant. These contradictory conclusions provoke two important questions we try to answer in this research. First, why does the market react negatively to the internal investigation initiation given that gains from backdating are insignificant, there are no cash flow implications and the internal review resolution and outcome are unknown at the time? Second, why is management risking involvement in fraud, deception, misrepresentation and violation of securities laws when the gains from the backdating strategies are not found to be significant? We address whether there are motives beyond management opportunism or wealth extraction.

To examine the first question we propose the market overreacts to the investigation initiation announcement. Prior studies have essentially assumed companies initiating an internal investigation are guilty of intentional backdating and that the market correctly anticipates this outcome and related costs. We propose that the likelihood of intentional backdating is not large and argue the market overestimates this likelihood and the risks and costs with associated litigation, regulatory intervention, and management departure. The *outcome* investigation announcement is critical in testing for the market overreaction as it discloses the verdict of the final internal investigation report. Further, it reveals whether the company is involved in intentional or unintentional backdating. We examine market response to the disclosure of the internal review committee report, relative to the market response to the *initial* investigation announcement of backdating. We also argue that the overreaction can partly be explained by potential media-bias and the tendency for the media to focus on, and provide more coverage for bad news as opposed to good news.

To address the second question we examine the motives of intentionally-backdating firm managements, an unexamined sample. Previous studies do not specifically or fully take into account the outcome of the internal investigation revealing that the alleged backdating was intentional, unintentional, or was not backdating at all. Combining innocent (unintentional/non-backdating) and guilty firms (intentional backdating) makes an inferior research design in determining what motivates backdating. Specifically, intentional backdating is more likely to be associated with opportunistic behavior and serious legal/financial outcomes as opposed to unintentional backdating. Thus, we reexamine management motives by first identifying the intentional backdaters. We can then analyze management and boards motives properly. Prior studies have not addressed the motive issues with the sample of "true" backdaters. This is our second contribution.

An additional important contribution of this study is that unlike previous studies we examine the resolutions of internal investigations. We find first, that 48 percent of the accused companies are not involved in backdating, or the backdating was unintentional. Second, the market-value due to the initiation of internal investigation announcements is almost completely offset by positive and significant market-value gains for innocent companies at the outcome announcement date. We conclude previous studies overstate the number of companies involved in illegal or intentional backdating as they do not examine investigation outcomes. Further, by not accounting for the effect and implications of the investigation outcome, they overstate the economic impact of backdating. Their analysis acts to prematurely condemn a significant number of innocent companies and the attendant media attention imposes undue hardship and costs on these companies.

Results of the univariate analysis of backdating (intentional, unintentional and no backdating both, combined and separated samples) versus a matching sample shows that first, backdating firms have a higher proportion of options in their compensation structure, less effective corporate governance and internal control systems. These environments may have fostered backdating practices. Second, backdating firms grant more options to their employees than to their top five executives and have a higher pay for performance sensitivity of option grants relative to the matching group. Thus, backdating may serve as a motivational tool to increase performance for companies with higher option sensitivity and/or more options granted to non-executives. Third, companies involved in intentional backdating have a higher average restatement amount relative to unintentional or non-backdating firms. This difference principally reflects the fact that the latter group does not need to restate their financial statements or the restatement amount is much smaller. Fourth, intentional backdating firms are ranked lower on the corporate governance index and higher on the entrenchment index, have more material weaknesses, greater management departure, more lawsuits, lower growth opportunities and tend to belong to high-tech industries. Collectively, these results clearly point to the importance of differentiating between intentional and unintentional backdating based on the investigation outcomes.

The backdating initiating announcement shows a significant negative market reaction translating into a market value decline of -$192.96 million per firm over the three-day window. This is nearly twice the average restatement of $96.967 million. It greatly exceeds the mean value of options granted of $1.716 million, and it similarly exceeds the mean value of total compensation to the CEO of $2.941 million. These results suggest that financial-reporting motives, the presumed negative affect of restatements on reported earnings and thereby the management private-benefits hypothesis cannot account for, or explain, a decline of $192.96 million per firm in equity value. These results are consistent with the market overreaction argument. Apparently investors assign a higher probability of guilt/larger expected costs to companies announcing initial internal investigations.

Outcome announcements of unintentional, or no backdating, are associated with positive and significant market reactions. These results nearly offset the negative initial investigation market reactions, both in terms of returns and dollar value. They provide direct support to the market-overreaction hypothesis. This suggests that investors revise their prior assessment upward to correct for their initial overreaction. Conversely, for firms revealing intentional backdating, the market reaction is negative but not significant. These results provide additional support for the market-overreaction argument. They suggest that since the market has already overreacted by assuming a guilty verdict for all firms, the outcome announcement does not provide significant incremental information as it represents a confirmation of investors' previous assessments.

Cross-sectional analysis of market response to the initial-investigation announcement suggests first that companies with lower (higher) rankings on the corporate governance (entrenchment) index, more material weaknesses and those followed by a lower number of analysts, generate a more negative market response. Second, litigation risk, leadership risk and media bias in the coverage of backdating, con-

tributes to the negative market reaction even for companies that are subsequently exonerated by the company's internal review. These results lend additional support to the market-overreaction hypothesis.

The logistic regression sample of intentional backdating results suggest firms with a higher option proportion to total compensation, a higher percentage of management and board shares and options, with weak corporate governance/internal control system over financial reporting are more likely to backdate ESOs. These findings support the management opportunism hypothesis. However, companies with higher employee option pay sensitivity and higher percentages of employee option grants are also more likely to backdate. These findings are consistent with the employee-benefits hypothesis. Additionally, given the relatively small number of companies that become subject to enforcement actions by the SEC and/or DOJ, the typically small monetary settlements and insignificant market reaction to enforcement action announcements, this evidence suggests that previous studies overestimate the economic impact of backdating.

In conclusion, our research finds that the negative market response to initial investigation announcements can be attributed to market overreaction aggravated by media coverage of backdating as a negative event. It is critical that the monetary gain from backdating strategies is not significant and there is an absence of cash-flow implications. Further, the resolution and outcome of the review are unknown at initiation. Initial, and possibly unwarranted market reaction leads to investor losses that far exceed any management gains. Furthermore, intentional backdating is found to be associated by opportunistic, wealth extraction motives and the desire of management to compensate and motivate employees while avoiding the tax and the accounting consequences associated with in-the-money options grants. Finally, our results show that by failing to account for the outcomes of the internal backdating investigations, previous research both overstates the economic impact of backdating events and unfairly portrays nearly half of the firms involved as being presumed guilty until proven innocent.

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Appendix

Table 1. Summary statistics and frequency distribution of the final sample

SIC code is the standard industrial classification code[1]. *FREQ* is the number of companies within each industry group. *HITECH* indicates whether the company is in the high-tech sector based on their business description. *RESTATED* indicates whether the internal review committee decided to restate previous financial statements. *OUTCOME* is the outcome of the internal review where NB indicates the investigation reveals no backdating, UB indicates unintentional backdating and IB indicates intentional or evasive backdating that may involve fraud and manipulation. *RESIGN* indicates whether the investigation leads to resignation of the CEO, CFO or a member of the top management team. *SELF* indicates whether the company initiated the investigation without any request from the SEC or the DOJ. SEC and DOJ indicate who initiated the investigation, while *JOINT* indicates both the SEC and DOJ initiated the investigation. *MW* is the number of companies with material weaknesses. *NSUITS* is the number of shareholder law suits filed against the company.

SIC code	*FREQ*		*HITECH*		*RESTATED*		*OUTCOME*			*RESIGN*		*SELF*	Non-firm initiations				
	No.	%	Yes	No	Yes	No	NB	UB	IB	Yes	No	Initiations	SEC	DOJ	JOINT	MW	NSUITS
1	2	1.5	0	2	1	1	1	-	1	1	1	-	1	-	1	0	5
2	10	7.4	0	10	7	3	3	5	2	1	9	3	6	-	1	3	4
3	56	41.1	46	10	39	17	10	12	34	20	36	16	13	2	25	20	124
4	6	4.4	6	0	5	1	1	1	4	2	4	2	1	-	3	3	9
5	15	11.0	2	13	12	3	2	7	6	1	14	7	4	-	4	4	9
6	4	2.9	0	4	3	1	1	-	3	3	1	2	-	-	2	4	23
7	37	27.2	33	4	29	8	7	11	19	16	21	10	13	1	13	15	55
8	6	4.4	0	6	4	2	1	3	2	4	2	3	1	1	1	3	4
Total	136	100	87	49	100	36	26	39	71	48	88	43	39	4	50	52	233
Percent	NA	100	63.9	36.1	73.5	26.5	19.1	28.7	52.2	35.3	64.7	31.62	28.68	2.94	36.76	38.2	na

Table 2. Univariate analysis of backdating versus non-backdating firms and intentional versus unintentional/non-backdating firms

The univariate analysis is based on the sample of 142 backdating firms that announce the outcome of the investigation (for which the cumulative abnormal returns are not required). IB represents intentional backdating. UINB is unintentional or no backdating. *BSVTC* is the Black-Scholes option value of options granted scaled by total compensation. *PSHROWN* is the percentage of shares and options held by management and board members. *CGINDX* (*EINDX*) is the corporate governance (entrenchment) index. *CINDX* is the composite corporate governance entrenchment index. *DWEAK* is a dummy variable equal to one if the company reported material weakness in the year preceding the announcement and is zero otherwise. *ANALYST* is the number of analysts following a given firm. *PCTEMP* is the percentage of options granted to employees (non-top five executives). *PPSOG* is the pay-performance sensitivity of option grants calculated as percentage of the firm's stock on which options are written multiplied by the options' deltas. *HITECH* is a dummy variable equal to one if the company belongs to the hi-tech sector and is zero otherwise. *TOBQ* is Tobin's *q* ratio calculated as market value of equity divided by book value of equity. *ROE* is the return on equity. *LMVEQ* is the log of market value of equity. AMT is the restatement amount (in $ millions). *AMTEQ* is *AMT* scaled by total equity. *DRESIGN* is a dummy variable equal to one if one or more executive(s) resign, are fired or relocated and is zero otherwise. *NSUITS* is the number of lawsuits filed against the firm. *DSELF* is a dummy variable equaling one if the company self-reported and is zero if the investigation is initiated by the SEC or DOJ. *MEDIA* is the number of articles related to the company's backdating news divided by the number of all articles related to the company that are found on the Internet. *NOBD* is the number of options backdated relative to the total number of common shares outstanding. na indicates not available.

Variable	All	Backdating	Matching	Mean diff.	IB	UINB	Mean diff.
BSVTC (%)	44.0	50.1	39.0	10.4***	50.2	48.4	1.8
PSHROWN (%)	5.1	7.9	2.3	5.6***	7.5	8.1	-0.6
CGINDX	8.450	8.010	8.830	-0.820***	6.918	8.891	-1.973***
EINDX	1.970	2.576	1.640	0.708***	2.849	1.887	0.962***
CINDX	0.289	0.388	0.117	0.271***	0.318	0.491	-0.173***

[1] SIC codes are defined as: 1– mining and construction; 2 – manufacturing of food, tobacco, textiles, apparel, lumber and wood products, chemical and petroleum industries; 3 – manufacturing of rubber, stone, concrete, metals, machine and computer equipment, electronics, transportation and medical equipment; 4 – transportation, communication, electric, gas and sanitary services; 5 – wholesale and retail trade; 6 – finance, insurance and real estate; 7 – hotel, business, automotive, motion picture and recreational services; and 8 – health, legal, educational, professional and other services.

Table 2 (cont.). Univariate analysis of backdating versus non-backdating firms and intentional versus unintentional/non-backdating firms

Variable	All	Backdating	Matching	Mean diff.	IB	UINB	Mean diff.
DWEAK	0.313	0.481	0.219	0.262***	0.634	0.354	0.280***
ANALYST	11.481	12.766	10.751	2.015*	12.366	12.246	0.120
PCTEMP (%)	78.8	81.1	76.5	4.6***	81.9	80.1	1.8
PPSOG (%)	74.1	99.4	59.7	39.7**	77.2	78.0	-0.8
HITECH	0.626	0.701	0.584	0.117*	0.718	0.554	0.164**
TOBQ	3.266	2.098	3.922	-1.824*	2.466	4.568	-2.102**
ROE (%)	1.0	0.5	0.2	0.7	-0.6	1.7	-2.3
LMVEQ	7.384	7.518	7.309	0.208	7.479	7.433	0.046
AMT ($m)	na	96.967	na	na	165.369	22.252	143.117***
AMTEQ (%)	na	4.2	na	na	6.2	2.0	4.2***
DRESIGN	na	0.375	na	na	0.606	0.123	0.483***
NSUITS	na	1.985	na	na	2.803	1.092	0.991***
DSELF	na	0.316	na	na	0.263	0.369	-0.101
MEDIA	na	0.022	na	na	0.022	0.023	-0.001
NOBD (%)	na	4.9	na	na	5.2	4.7	0.5

Note: ***, **, and * denote a significance at the one, five, and ten percent levels, respectively.

Table 3. The market response to the initiation and the outcome announcements of internal/external investigations of backdating

The table reports the three-day (*t*-1, through *t*+1) cumulative average abnormal return (*CAAR*) from the Fama and French (1993) three-factor model around the announcement date of the initiation of the internal investigation and the announcement of the outcome of the investigation. The analysis was performed on the total sample and based on the outcome and whether the investigation reveals intentional, unintentional, or no backdating. The combined period is defined as the *CAAR* over the period from one day before the announcement of the initiation of the internal investigation to one day after the outcome announcement date. Difference is the difference in *CAAR*s between the initiation date and the outcome date. *JNZ* is the Jackknife Z statistic. *DCAAR* is the change in *CAAR*s. *ACMV* is the average change in market value of the firm equity in dollar terms. *DACMV* is the difference in the average change in market value of the firm. t-stat is the t-statistic testing for a significant difference between the two means, i.e., either *CAAR* or *ACMV*.

Announcement dates	Initiation date			Outcome date			Combined period		Difference	
Sample/subsample	N	CAAR	JNZ	N	CAAR	JNZ	CAAR	JNZ	DCAAR	t-stat
1.1. Total sample	136	-3.750	-5.270***	145	0.447	1.286	-1.917	1.360	-4.197	-6.438***
1.2. Intentional backdating	71	-5.150	-5.722***	72	-0.410	-0.752	-5.628	3.325***	-4.740	-5.812***
1.3. Unintentional backdating	39	-1.540	-3.017***	47	1.431	2.984**	2.219	1.562	-2.971	-3.112***
1.4. No backdating	26	-1.882	-3.551***	26	1.594	3.698***	2.013	1.201	-3.476	-3.006***
1.5. Unintentional and no backdating	65	-1.660	-3.890***	73	1.480	3 211***	2.137	1.604	-3.140	-4.051***
1.6. (1.2. minus 1.3.)	32	-3.610	-4.836***	25	-1.841	-3.613***	na	na	na	na
1.7. (1.2. minus 1.4.)	45	-3.268	-3.448***	46	-2.004	-3.812***	na	na	na	na
1.8. (1.3. minus 1.4.)	13	0.342	-1.133	21	-0.163	-0.496	na	na	na	na
The change in the market value of equity ($ million)										
Sample/subsample	N	ACMV	JNZ	N	ACMV	JNZ	ACMV	JNZ	DACMV	t-stat
2.1. Total sample	136	-192.96	-5.779***	145	23.309	0.987	-98.234	-1.405	-216.269	.4 321***
2.2. Intentional backdating	71	-330.11	-7.020***	72	-26.281	-1.011	-360.744	4.621***	-303.829	-6.761***
2.3. Unintentional backdating	39	-57.800	-3.211***	47	53.709	3.065***	83.285	1.181	-111.509	-3.025***
2.4. No backdating	26	-77.95	-3.678***	26	66.023	3.221***	83.377	1.270	-143.973	-3.234***
2.5. Unintentional and no backdating	65	-65.53	-3.981***	73	58.425	3.581***	84.360	1.532	-123.955	-3.871***

Note: ***, **, * indicate significance at the one, five, and ten percent levels, respectively.

Table 4. Logistic regression analysis comparing the matched sample of backdating versus comparison firms

$$BDATE = \beta_0 + \beta_1(BSVTC) + \beta_2(PSHROWN) + \beta_3(CINDX) + \beta_4(DWEAK) + \beta_5(ANALYST) + \beta_6(PPSOG) + \beta_7(PCTEMP) + \beta_8(HITESH) + \beta_9(TOBQ) + \beta_{10}(ROE) + \beta_{11}(LMVEQ) + \varepsilon.$$

The logistic regression model is shown above. This table depicts the results from estimating the above logistic regression equation for 142 companies (71 intentional backdaters and 71 matching non-backdating firms). *BDATE* is an indicator variable equaling one for backdating firms and zero for matching firms. *BSVTC* is the Black-Scholes option value of options granted scaled by total compensation. *PSHROWN* is the percentage of shares and options held by management and board members. *CINDX* is the composite corporate governance and entrenchment index. *DWEAK* is a dummy variable equal to one if the company reported material weakness in the year preceding the announcement and is zero otherwise. *ANALYST* is the number of analysts following a given firm. *PPSOG* is the pay performance sensitivity of option grants. *PCTEMP* is the percentage of options granted to employees (non-top five executives). *HITECH* is a dummy variable equal to one if the company belongs to the hi-tech sector and zero otherwise. *TOBQ* is Tobin's q-ratio and it is calculated as market value of equity divided by book value of equity. *ROE* is the return on equity. *LMVEQ* is the log of market value of equity. t-stat is the t-test statistic testing for a significant difference between the parameter estimate and zero. Pseudo R-square may be interpreted like the R-square value in a normal regression. na indicates not available.

Variable	Predicted sign	Model 1		Model 2		Model 3		Model 4	
		Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
BSVTC	+	1.453	2.038**	1.534	2.188**	na	na	1.928	2.810***
PSHROWN	+	6.361	1.583	6.120	1.532	5.688	1.484	7.052	1.853**
CINDX	-	-1.434	-3.045***	-1.450	-3.089***	-1.454	-3.134***	-1.420	.3 142***
DWEAK	+	1.091	3.050***	1.117	3.137***	1.087	3.105***	1.102	3.167***
ANALYST	-	-0.010	-0.297	-0.026	-0.992	-0.043	-1.755*	na	na
PPSOG	+	0.6334	2.611**	0.586	2.560**	0.711	2.928***	na	na
PCTEMP	+	3.558	2.732***	3.559	2.729***	2.820	2.281	2.315	2.124**
HITECH	+	0.184	0.448	0.266	0.682	0.131	0.346	0.049	0.129
TOBQ	+/-	-0.035	-1.065	-0.034	-1.063	-0.032	-1.006	-0.047	-1.566
ROE	+/-	-0.002	-0.003	-0.106	-0.199	-0.141	-0.278	-0.005	-0.011
LMVEQ	+/-	-0.119	-0.658	na	na	na	na	-0.013	-0.100
Intercept	na	5.625	3 294***	4.866	3.893***	3.945	3.479***	3.504	2.895***
Pseudo R-square		0.220		0.2183		0.2011		0.1870	

Note: ***, **, * indicate significance at the one, five, and ten percent levels, respectively.

Table 5. Results of the cross-sectional analysis of backdating firm characteristics

$$CAAR = \beta_0 + \beta_1(BSVTC) + \beta_2(PSHROWN) + \beta_3(CINDX) + \beta_4(DWEAK) + \beta_5(ANALYST) + \beta_6(DRESIGN) + \beta_7(NSUITS) + \beta_8(DSELF) + \beta_9(MEDIA) + \beta_{10}(PPSOG) + \beta_{11}(PCTEMP) + \beta_{12}(HITESH) + \beta_{13}(NORD) + \beta_{14}(AMTEQ) + \beta_{15}(TOBQ) + \beta_{16}(ROE) + \beta_{17}(LMVEQ) + \varepsilon.$$

This table depicts the results from estimating the above cross-sectional regression equation for 136 backdating firms. *CAAR* is cumulative average abnormal return during the three-day initiation announcement period. *BSVTC* is the Black-Scholes value of options granted scaled by total compensation. *PSHROWN* is the percentage of shares and options held by management and board members. *CINDX* is the composite corporate governance entrenchment index. *DWEAK* is a dummy variable equal to one if the company reported material weakness in the year preceding the announcement and is zero otherwise. *ANALYST* is the number of analysts following a given firm. *DRESIGN* is a dummy variable equal to one if one or more executive(s) resign, are fired or relocated and is zero otherwise. *NSUITS* is the number of lawsuits filed against the firm. *DSELF* is a dummy variable equal to one if the company self-reported and is zero if the investigation is initiated by the SEC or DOJ. *MEDIA* is the number of articles related to the company's backdating news divided by the number of all articles related to the company. *PPSOG* is the pay-performance sensitivity of option grants calculated as a percentage of the firm's stock on which options are written multiplied by the options' deltas. *PCTEMP* is the percentage of options granted to employees (non-top five executives). *HITECH* is a dummy variable equal to one if the company belongs to the hi-tech sector and zero otherwise. *NOBD* is the number of options backdated relative to the total number of common shares outstanding. *AMTEQ* is the restatement amount scaled by total equity. *TOBQ* is Tobin's q ratio. *ROE* is the return on equity. *LMVEQ* is the log of market value of equity. Adj. R-square is the adjusted R-square value. *PE* is the parameter estimate. t-stat is the t-test statistic testing for a significant difference between the parameter estimate and zero. White is the White test (1980) statistic for a significance difference between the parameter estimate and zero. na indicates not available.

Hypothesis/variables	Exp. sign	Model 1			Model 2			Model 3		
		PE	t-stat	White	PE	t-stat	White	PE	t-stat	White
BSVTC	-	-0.003	-0.190	-0.207	-0.010	-0.520	-0.634	-0.009	-0.540	-0.638
PSHROWN	-	-0.004	- 0.120	-0.118	-0.003	-0.070	-0.094	na	na	na
CINDX	+	0.026	3.020***	3.097***	0.026	2.930***	2.829***	0.025	2.970***	2.991***
DWEAK	-	-0.029	-3.180***	.4 041***	-0.034	-3.550***	-4.872***	-0.030	-3.210***	-4.201***

Table 5 (cont.). Results of the cross-sectional analysis of backdating firm characteristics

Hypothesis/variables	Exp. sign	Model 1			Model 2			Model 3		
		PE	t-stat	White	PE	t-stat	White	PE	t-stat	White
ANALYST	+	0.002	3.110***	2.530***	na	na	na	0.002	3.360***	2.586***
DRESIGN	-	-0.020	-2.140**	2 714***	-0.030	-3.250***	-3.932***	-0.019	-2.100**	-2.586***
NSUITS	-	-0.006	-3.180***	-1.787**	na	na	na	-0.006	-3.240***	-2.082***
DSELF	+	0.013	1.400	1.516	0.015	1.630	1.927**	0.013	1.480	1.522
MEDIA	-	-0.414	-2.980***	-2.146**	-0.511	-3.540***	-2.270***	-0.408	-2.960***	-2.136**
PPSOG	+	0.008	1.580	1.623	0.004	0.740	0.718	0.008	1.540	1.754*
PCTEMP	+	0.022	0.870	1.364	0.034	1.350	1.998**	na	na	na
HITECH	-	-0.026	-2.770***	-2.927***	-0.024	-2.500**	-2.869***	-0.024	-2.680***	-2.667***
NOBD	-	-0.098	-1.400	-1.245	-0.158	-2.110**	-1.744*	-0.079	-1.190	-1.037
AMTEQ	-	0.059	0.810	0.564	-0.029	-0.400	-0.243	0.058	0.810	0.554
TOBQ	+/-	0.000	0.220	0.099	0.000	0.500	0.339	0.000	0.240	0.310
ROE	+/-	-0.005	-0.110	-0.104	na	na	na	-0.005	-0.130	-0.103
LMVEQ	+/-	na	na	na	-0.001	-0.120	-0.121	na	na	na
Intercept	Na	-0.017	-0.690	-0.887	-0.001	-0.020	-0.031	0.000	0.030	0.010
F-value / Adj. R-square		9.450*** / 0.525			8.490*** / 0.463			10.770*** / 0.530		

Note: ***, **, * indicate significance at the one, five, and 10 percent level, respectively.

Table 6. SEC and DOJ case characteristics and frequency distribution by defendant, charges, and settlement

This table depicts the characteristics of the 27 cases launched by the SEC (sole plaintiff) and 8 cases where the plaintiff is both the DOJ and the SEC. The settlement classified as type A required the company to retain an internal auditor, appoint a corporate compliance officer, install a training program for employees, hire an independent examiner to review accounting practices, and make payment to injured investors. B denotes a civil monetary penalty. C denotes disgorgement (forced repayment) of ill-gotten gains. D denotes prejudgment interest paid on disgorgement amounts. E denotes permanent suspension from practicing before the SEC as an accountant. F is for forfeiture. G denotes a five-year, 10-year or permanent ban on acting as an officer or director of a public company. *H* indicates a permanent injunction barring the defendant from violating federal securities laws. *I* denotes reimbursement of bonuses. *J* denotes jail sentences (one is a six-month sentence and the other is for a 25-month sentence). *K* denotes payment of a fine. *L* denotes a two-year ban from acting as an attorney. *UHG is United Health Group Inc.

Defendant title	N	Charges	N	Settlement	N
Chief Executive Officer	16	Securities fraud	27	A	5
Chief Financial Officer	15	Obstruction of justice	1	B	19
Chief Operating Officer	4	False filing to SEC	5	C	13
Vice President	4	Lying to Accountant	2	D	12
General Council	9	Tax evasion	2	E	4
Chairman of the Board	1	Mail fraud	1	F	1
Controller	3	Money laundering	1	G	15
Member Compensn. Comm.	1			H	3
Director	2			I	2
Co-Chief Financial Officer	1			J	2
Chief Accounting Officer	1			K	3
				L	1
Monetary settlement summary statistics and frequency distribution by amount					
Mean and median ($ millions)	Amount	Bracket		N	Average
Average with UHG	29.896	Less than $1		7	0.513
Average without UHG	6.731	From $1 to $10		7	4.091
Median with UHG	3.986	From $10 to $20		3	11.808
Median without UHG	3.100	From $20 to $40		2	30.125
		Greater than $40		1	470.021*