

Option Backdating and Board Interlocks

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Abstract

We provide insight into how the controversial practice of backdating employee stock options spread across firms. Our analysis indicates that interlocking boards played a significant role in the spread of backdating. In some empirical specifications more than half of the unconditional probability that a firm starts to backdate is explained by having a board member linked to another firm that already backdates. We also find that firms with younger CEOs, higher stock price volatility, and larger holdings of stock and options by the CEO are more likely to begin to backdate. Our results on board interlocks provide an explanation for how this practice could have spread to so many firms over a wide range of industries. Although we focus on the role that board interlocks play in explaining the spread of the practice of backdating stock options, we believe that our contribution to the literature is deeper. Our analysis indicates that boards operate in complex and dynamic social environments and suggests that recognizing and accounting for this environment is important to understanding how boards function and the role boards play in managerial oversight and corporate strategy.

1. Introduction

Prior to passage of the Sarbanes-Oxley act (SOX) in 2002 firms did not have to report the dates of option grants until 45 days after the end of the fiscal year. This reporting window gave firms the opportunity to “look back” and select favorable dates, when the stock price was at its lowest for example, to grant stock option awards. By looking back in this manner firms can make it appear that the option award was granted at an earlier date and a lower exercise price compared to the actual grant date. This practice, now commonly referred to as backdating, is among the biggest corporate scandals of recent times. Heron and Lie (2006) estimate that 18.9% of unscheduled at-the-money option grants to top executives during the period 1996-2005 exhibit evidence of backdating or manipulation, with the majority occurring before the implementation of SOX. At the firm level, they suggest that nearly 30% of firms manipulated option grants at some point during this period. Other studies, such as Narayanan and Seyhun (2006) provide additional evidence of the widespread nature of this practice.

While the above evidence suggests that by 2002 the practice had become widespread, little is known about how this practice began and how it proliferated across firms. In our sample, for example, about 7% of firms reporting an option grant in 1996 demonstrate evidence of backdating. By 2002, over 40% of firms in our sample exhibit evidence of backdating.¹ Besides having increased in frequency over time, this practice appears to be prevalent in a wide range of industries. For example, in over half of the industries examined in this study more than 20% of firms are identified as backdating

¹ These statistics are based on a definition of backdating that requires at least a 10% negative abnormal return in the 20-day period prior to the reported grant date, followed by at least a 10% positive return in the 20-day period following the reported grant date. The issue of identifying backdating firms is discussed in more detail below.

option grants. The increase in the frequency of this practice over time and its prevalence across firms and industries poses an interesting question – how did this practice spread so quickly and become so common? This question is particularly interesting, since for the most part, the first public mention that firms might be engaging in backdating options does not occur until 2004.²

The purpose of this paper is to provide evidence regarding the propagation of backdating. Given that the practice was not publicly disclosed and is present in a wide range of firms in different industries, it is unlikely that the practice originated independently at each firm. We focus on the role that director interlocks play in contributing to the spread of backdating. The board of directors has significant control over the level and structure of executive compensation, including determining the amount of options granted and when to grant the options. Consequently one way the practice of backdating could have spread in such a short time period to so many firms is through board interlocks and board connections, which we define as firms that share the same board member.

We find strong evidence that board interlocks are related to the spread of the practice of backdating of stock options. According to our findings, a firm is much more likely *to begin* backdating option grants if the firm has a director that is a board member of another firm that is previously identified as backdating its stock options. Our results are both statistically and economically significant. For example, the unconditional

² While prior to 2004 there was work on the timing of stock options, see Yermack (1997) and Aboody and Kasznik (2000), the first academic paper that mentions backdating was Lie (2005). While published in 2005, Lie (2005) was a working paper in 2004. In a Lexis Nexis search looking for the term backdating and stock options both mentioned in any document, the first mention of the practice occurs in a news story in 2001 in the Buffalo news where an employee of National Fuel Gas accused upper level management of backdating options. The next news story that is relevant to backdating stock options doesn't occur until 2005. The SEC announced it was looking into option timing in a press article in 2004 but the article did not mention backdating.

probability of a firm being classified as a new backdater in any particular year is about 8% in our sample. Having a board member who is on the board of another firm that has been previously identified as backdating its stock options accounts for almost a quarter of this unconditional probability. In some specifications more than half of the unconditional probability of being classified as a new backdater is explained by board interlocks to previously identified backdaters. We do not find evidence that a board connection through the CEO has an incremental effect on the likelihood of backdating beyond having a general board connection with a backdating firm.

We also identify several other firm and governance characteristics that are associated with the spread of option backdating. We find that firms with higher stock-price volatility are more likely to start to backdate options. This result is not surprising, because firms with higher volatility have a greater ability to backdate options because of the larger variations in stock price over time. Firms with younger CEOs are also more likely to begin to backdate option grants. Firms with younger CEOs tend to grant more options and with greater frequency, which enhances the incentives to engage in backdating. Similarly, the likelihood of a firm initiating backdating is positively correlated with the stock and option ownership of the CEO.

Besides our time series analysis which focuses on the spread of this practice we also conduct cross sectional analysis. While cross-sectional regressions do not provide evidence on how the practice spread, they do provide additional insight into whether the practice of backdating is systematically associated with certain firm and governance characteristics. Similar to our time-series results, we find that a firm is more likely to be associated with backdating of options if they have a board member linked to another firm

that also backdates options. In addition, we find that backdating is more common at firms with smaller boards, younger CEOs, and when the CEO is also the Board Chair. Finally, we find some evidence that backdating is more frequent the less independent the board. Our cross sectional results confirm our time series analysis that the relations firms have through board connections is a primary factor associated with the spread of this practice. The cross sectional analysis also provides some evidence that firms with weaker governance characteristics, like a less independent board, are more likely to backdate.

Our paper makes several of important contributions. First, we provide an understanding of how this controversial practice spread across firms. Given that the legality of backdating is still unclear and the fact that the practice appears to have been widespread, but not publicly disclosed until recently, suggests that understanding how firms came to adopt this practice is of interest to practitioners, academics, and regulators. Second, we contribute to the current literature that examines the governance characteristics associated with backdating. Bebchuk, Grinstein, and Peyer (2006) and Collins, Gong, and Li (2006) look at the cross sectional characteristics of firms that backdate. While we also examine some of the same issues unlike these studies our focus is about how this practice spread. Finally our analysis also adds to the broader literature on corporate governance and in particular to the literature that looks at the role social networks and board interlocks play in determining governance practices. Hallock (1997), Barnea and Guedj (2006), and Larcker, Richardson, Seary, and Tuna (2006) examine board interlocks and the level of CEO compensation.³ Most of this work has focused on

³ Hochberg, Ljungqvist, and Lu (2006) examine the role that networks play in the venture capital industry, and Kuhnen (2006) examines the effects of social networks on performance in the mutual fund industry.

whether board interlocks and connectivity exacerbate agency problems within the firm by looking at the cross-sectional relation between pay and board connections. As mentioned above, while we provide some insight into how connectivity contributes to agency problems our focus is different. We are more interested in documenting how board connections affect the spread of corporate policy both across time and across firms. To date, there is limited research in finance that examines how board connections facilitate the spread of corporate practice, although Davis (1991) and Davis and Greve (1997), who examine the role of board interlocks in explaining the adoption of poison pills and golden parachutes are notable exceptions.

The remainder of this paper is organized as follows. Section 2 describes the practice of backdating options and motivates the paper. Section 3 describes our data and our measures of board connectedness. Section 4 presents our empirical results and discusses our findings. Section 5 concludes with a summary.

2. Prior Research and Motivation for this Study

2.1 Previous research on backdating

The majority of incentive based pay that goes to senior level managers comes in the form of employee stock options (ESOs).⁴ For the most part these instruments vary little in their features. The contractual life of the vast majority of options granted to employees is between 5 and 10 years (with most having a contractual life of 10 years). Most ESOs are also granted at-the-money, where the exercise price of the option is set at the market price the date of the grant. There are a couple of reasons why the majority of option grants are at-the-money, the primary one of which involves expensing of these

⁴ Murphy (1999) provides a review of compensation practices in U.S. firms.

securities. Prior to 2005, firms expensed the intrinsic value of their options. Since options that are granted at-the-money have an intrinsic value of zero, firms that granted at-the-money options did not have to record an expense for these options. Option grants with an intrinsic value greater than zero would have had to be expensed in the income statement. Additionally, Section 162(m) of the internal revenue code, which was adopted in 1993, requires firms to pay taxes on compensation in excess of \$1 million that is not performance based. Firms who granted in-the-money options could have been required to pay taxes on the intrinsic value of these grants if their executives already received non performance based pay in excess of one million dollars.

Since any price appreciation following a grant increases the value of the options executives have incentives to try and time the granting of these awards, either following poor stock price performance (to lower the exercise price) or prior to good stock price performance (to gain on the price increase following the grant). Yermack (1997) and Aboody and Kasznik (2000) document stock-price performance surrounding the granting of stock options, and find evidence that, on average, stock options are awarded prior to increases in stock-price. They suggest that managers manipulate the timing of their stock option grants to take advantage of good news following the grant. In contrast, Chauvin and Shenoy (2001) find some evidence of stock price decreases prior to stock option grants and suggest managers release poor news just prior to a grant in order to lower the strike price of the grant.

More recently, Lie (2005), Heron and Lie (2006) and Narayanan and Seyhun (2006) re-examine the stock-price performance surrounding stock option grants in the mid to late 1990s and find, for a significant number of option grants, a pattern of poor

stock-price performance prior to the grant followed by a reversal in stock-price performance after the grant. Given the large number of companies that exhibit this share price reversal, all three papers argue that the evidence suggests that a large number of firms set the grant date retroactively in order to lower the strike price of the option. An article in the WSJ estimated that the odds that the stock-price reversal surrounding six option grants to an executive of Affiliated Computer Services Inc. was completely random to be about one in 300 billion - the suggestion being that the ACS executive was not likely to have received an option grant on a randomly chosen day with the observed stock price pattern.⁵

It is not illegal to grant in-the-money options. Neither is it illegal per se to set the grant date retroactively.⁶ If stock option awards are backdated, however, the practice must be revealed in proxy statements and any intrinsic value must be expensed. Failure to report the practice of backdating raises reporting and tax issues. The SEC seems to agree with the conclusions of these studies that firms are backdating stock options without reporting the practice and has filed enforcement complaints at a large and growing number of companies. At this point the SEC is investigating over 100 companies for backdating stock options. In addition, both the IRS and the Justice department are looking into this practice.⁷

2.2 Prior research on board connectivity

⁵ See “The Perfect Payday; Some CEOs reap millions by landing stock options when they are most valuable; Luck – or something else,” Forelle and Bandler, *Wall Street Journal*, March 18, 2006 page A1.

⁶ A number of companies have argued that the reason they backdated stock options was to reduce the volatility in value of grants to new hires. Significant swings in the price of the stock during the year can create disparity in the value of the grants to employees depending on the date they were hired. For further discussion of this issue see “Gilded paychecks: Dating games,” Dash, *New York Times*, June 19, 2006.

⁷ A list of companies that are currently under investigation for backdating options can be found at <http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html>.

The board of directors plays a key role in both managerial oversight and in providing advice and guidance on corporate strategy. Because of the important role the board plays in key business decisions board members themselves are often executives of other firms or have some significant business, legal, or political experience. In addition, partly because of the limited pool of qualified candidates, it is not uncommon for a board member to sit on the board of more than one firm. These board connections between firms can be beneficial if they facilitate efficient transfer of information or knowledge, or if they facilitate learning about corporate policies and practices. Alternatively, these board interlocks and close relations between firms through director ties potentially reduce the independence of board members and can exacerbate the agency problems within the firm. A number of governance rating services and activist investors have raised the latter concern. The ISS, Corporate Library, and Governance Metrics all provide information on board interlocks in their services that analyze governance structure because of the concern that interlocks play in board independence.

Motivated by the idea that board interlocks might play an important role in information transfer across firms, several studies examine the role that board interlocks play in influencing corporate strategy and corporate practice. Haunschild (1993) examines how board interlocks influence acquisition activity. She finds that corporate acquisition activity is emulated across firms when they have interlocking board members. These results are supported by Haunschild and Beckman (1998) who find evidence that certain corporate practices are mimicked, such as acquisition activities, when firms share directors. Gulati and Wesphal (1999) find that firms are more likely to form strategic alliances, such as a joint venture, when the firms share outside directors, and Davis

(1991) and Davis and Greve (1997) find that the adoption of poison pills and golden parachutes are related to board interlocks. This research supports the notion that social networks, such as board interlocks, play an important role in facilitating the exchange of information between firms and in determining the types of practices adopted across firms and industries.

Other studies examine the role that board interlocks play in reducing board independence. One of the most important roles of the board is in setting CEO compensation. To the extent that board interlocks reduce the independence of the board and increase agency problems, board interlocks could contribute to higher levels of managerial pay. Hallock (1997), Core, Holthausen, and Larker (1999) and Fich and White (2003) find only limited evidence that interlocks lead to higher pay. In contrast, evidence in Barnea and Guedj (2996) and Larker et al (2006) suggests that more connected corporate boards lead to higher levels of managerial compensation. They both conclude that board connections lower board independence and increase agency problems within the firm.

2.3 Motivation and hypotheses

One interesting aspect of option backdating is that almost no public information existed about this practice prior to 2004. The earlier academic work such as Yermack (1997), Aboody and Kasznik (2000), and Chauvin and Shenoy (2001) focused on the issue of option timing. None of these studies, however, mentions backdating as a reason for their findings. The SEC announced an investigation into option timing in 2004, but did not mention the issue of backdating.⁸ The first mention of option backdating that we

⁸ See “Open Secrets: SEC Probes Options Grants As Company News Boosts Stock,” Solomon, *Wall Street Journal*, March 30, 2004.

could find was in an article in the Buffalo News in 2001.⁹ The article was about a former employee of Natural Fuel Gas who accused the CEO and other executives of backdating stock options. The next mention of backdating that appeared in the public domain is Lie (2005). There was a version of his paper circulating in draft form as early as 2004. Subsequent to 2001 the next mention of option backdating in the popular press is in 2005. Even prior to 2001, however, other studies along with ours demonstrate that backdating was being practiced at a significant number of companies.

The primary purpose of our paper is to document how the practice of backdating employee stock options spread across firms through time. While there may be questions regarding the legality of this practice, there appears to be less of a question that the practice is prevalent. And even if not illegal, at the very least the practice is controversial. Given that the practice, at least initially was not publicized, and given that the practice appears to have become relatively widespread, understanding how firms came to adopt this practice is of interest not only to academics, but also to market participants such as shareholders and regulators.

We hypothesize that board connections are one mechanism that facilitated the spread of the practice of backdating stock options. Boards play a crucial role in setting different aspects of corporate policy, one of which is managerial compensation. Moreover, it is not uncommon for board members of different firms to sit on the boards of other companies. Consequently, board members, through these board networks, can share information on corporate practices. One way that the practice of backdating stock options could have spread from firm to firm over time is through board connections and

⁹ We performed a Lexis Nexis search using the terms backdating and options occurring anywhere in the text of articles published in major U.S. newspapers. The first mention of this practice in the context of employee stock options was in 2001.

in particular board interlocks. We hypothesize that firms are more likely to begin backdating stock options if they share a board member with another firm that has previously backdated its stock options.

It is useful to compare our analysis with that of Davis (1991), who examines whether board interlocks contribute to the spread of poison pills across S&P 500 firms between 1984 and 1989. In contrast to the practice of backdating, which was not publicly disclosed, information on pill adoption is in the public domain. Most firms either announce they have adopted a poison pill or release the information in a proxy statement, annual report, or 10K. Since information about the poison pill is publicly available, knowledge about this practice does not have to spread through social networks or interlocking boards of directors. This makes it harder to distinguish whether this practice spread because of board connections or through another process. Since backdating was not a well known practice outside the companies who adopted it, we do not face the same problem.

Nevertheless, it remains possible that the practice of backdating option awards could also have spread through other social mechanisms. For example, board members of different firms often travel in similar social networks, belong to the same country clubs, and interact with other board members in various other professional and social environments. In addition, firms often share the same auditors or employ the same legal firms. Potentially, this practice may have spread across firms over time through mechanisms other than board interlocks, and we attempt to control for a number of these additional factors in our empirical analysis.

Additionally, there are other firm characteristics that are likely to affect the decision to backdate options. For example, firms with greater stock price volatility are more likely to have both the opportunity and motive to backdate option awards. Executives who receive options more frequently or who receive larger option awards have greater incentives to engage in backdating. The greater the control the CEO has over the firm's board potentially provides greater opportunities to backdate option awards. Finally, it is also possible that other governance characteristics, such as the independence of the board are related to the likelihood that a firm backdates option awards. We examine a number of these factors in our analysis.

3. Sample Data, Summary Statistics, and Measuring Board Connections

3.1 Sample of firms backdating options

To identify firms that potentially backdate stock option awards we begin with all stock option grants from the Thomson Financial Insider Filing database. The Thomson data contains information on option grants that are recorded in SEC Forms 3, 4, and 5. Thomson began gathering this information in electronic form in 1996. Among other things, the Thomson data provides information on the reported grant date of the options. We limit the time period covered to be from January 1996 through August 2002. We begin with 1996, since that is the first year Thomson began collecting data on option grants. We end our sample period in August 2002, since Heron and Lie (2005) find that the incidence of backdating appears to drop dramatically after August 2002, when the SEC began requiring firms to report option grants within two business days of the grant. This new requirement severely limits the ability of firms to manipulate the grant dates.

To form the sample used in our analysis we apply several filters to the Thomson data. The initial universe of option grants consists of 749,963 unique grant observations. Eliminating duplicate grant days within the same firm yields a sample of 62,398 unique firm-grant-day observations. We require observations to have stock-return data in CRSP for the 41 day period beginning 20 trading days prior and ending 20 trading days following the reported grant date. This yields a sample of 53,758 firm-grant-day observations. We also require the firms have a market capitalization of at least \$25 million, which reduces the sample to 44,896 observations. Finally, we require firms to have Compustat data on total assets and director data from the Compact Disclosure database (we discuss the Disclosure data in more detail below). After imposing these restrictions, our final sample is comprised of 39,715 firm-grant-day observations from 5,222 unique firms.

For each grant-day observation, we compute market-adjusted returns surrounding the grant date. An option grant-day is identified as being backdated if the market-adjusted stock price declined at least 10% in the 20 trading days prior to the grant and increased at least 10% in the 20 trading days after the grant. At the firm level, we classify the firm as backdating options in a given year if at least 20% of the firm-grant-days in that year exhibit evidence of backdating. To track the spread of this practice, we record the first year that a firm is classified as backdating option grants, and define a firm as being a new backdater in that year. Once a firm is initially identified as backdating its option grants, we continue to treat that firm as a backdating firm in subsequent years in the sample.

To test the robustness of our results to our backdating classification, we also examined cutoffs for share price declines and reversals of 5%, 15%, and 20%, used longer and shorter windows other than 20 trading-days pre- and post-grant, and varied the percentage of grant-days required to classify a firm as backdating its option grants. All of the results reported below are unaffected by reasonable changes in the criteria used to identify backdating firms.

Panel A in Table 1 provides summary statistics on the number of firms identified as backdaters by year using various criteria on pre- and post-grant return cutoff levels. One fact that stands out is the large increase in the number of firms identified with the practice of backdating. In 1996, using the 10% return filter and the 20% of grants cutoff, we identify 226 firms (7.4% of firms in the sample in that year) as having backdated stock options. By 2002 the number of firms identified with backdating sometime during the sample period increases dramatically to 1,382 (43% of the firms in the sample in that year). The dramatic increase in the frequency of this practice over time is robust to using other stock price performance filters and when considering the practice at the grant level instead of the firm level.

Panel B of Table 1 provides statistics on the stock price performance surrounding option grants for the 20 day periods prior to and subsequent to the grant date. We partition the grants and firms into three categories. The first category is grants made by firms that are ultimately identified as backdaters (based on the 10% return and 20% of grants filters) in the years prior to the year that they are classified as backdating option grants. The second category is grants made by these same firms in the sample years subsequent to (and including) the year they are initially identified as backdating option

grants. The third category is grants by firms that are never identified as backdaters during our sample period. Prior to the initiation of backdating, option grants at firms that eventually backdate show no poor performance prior to the grant but some evidence of a price runup subsequent to the grant. This is similar to the stock price patterns around option grants reported in Yermack (1997) and Aboody and Kasznik (2000). Following the initiation of backdating, the stock price patterns change dramatically. Firms identified as backdaters exhibit a substantial run down in stock price prior to the grant and a run up in stock price following the grant. The fact that the average magnitude of the returns around the grant date is close to the magnitude used to define the cutoff provides evidence that firms appear to systematically change the timing of their option grants in the years after they are identified as initiating backdating of stock options. Finally, for firms identified as never backdating grants at any time in our sample period we find some evidence of poor, although economically small, stock price performance prior to the grant, but no evidence of an increase in stock price following the grant. This result is broadly consistent with Chauvin and Shenoy (2001).

Finally, Panel C of Table 1 provides evidence that our criteria for identifying backdating firms are sufficient to reasonably classify firms that are likely to be manipulating the grant dates of options and that we are not likely to spuriously attribute backdating to random stock-price patterns around grant dates. For each firm-grant year in the sample we randomly generate 100 hypothetical grant-days and compute market adjusted stock returns for the 20-day periods prior and subsequent to the hypothetical grant dates. We then count the fraction of grant days that meet our 10% cutoff for identifying reversals in stock price performance around the grant date. This technique

results in drawing 477,546 hypothetical grant days of which 5.7% are associated with a stock price run down of 10% or more prior to the hypothetical grant day followed by a stock price run up of 10% in the 20-day period following the hypothetical grant. The results of the simulation suggest that our criterion for identifying a backdater is not likely to spuriously identify firms as manipulating their grant dates due to random stock-price movements.

3.2 Board of directors' sample and measuring interlocks

Data on directors and boards comes from the Compact Disclosure (CD) database for the years 1996 through 2002. Compact Disclosure provides the names of the board members for each firm in their database. We use that information to establish board interlocks. Firms are excluded if they have less than three board members and a market capitalization less than \$25 million dollars. The advantage of the CD database is that we have the names of board members for over 7,000 firms. The broad coverage of the database allows us to accurately trace interlocks across essentially the universe of publicly traded firms resulting in a powerful test of how board interlocks may have contributed to the spread of backdating over time. Firms are identified as having an interlock if they share a common board member. We use two primary measures of board interlocks. The first is an indicator set equal to one if two firms in the sample share a common board member in that year, and the second is a count of the number of common board members between each possible pair of firms.

Figure 1 presents a simple example and description of how board interlocks are characterized and linked to backdating firms and how we create our interlock variable(s). In this simple example we begin with three firms - Firm 1, Firm 2 and Firm 3. In Figure

1, Firms 1 and 2 are interlocked through board member E and Firms 2 and 3 are interlocked through board member I. For the time-series analysis, we are interested in whether Firm 2, which shares a board member with Firm 1, began to backdate provided that Firm 1 was already backdating options. In this illustration Firm 1 is identified as backdating option awards in 1996 but Firm 2 is not. Because 1996 is the first year of our sample, no firms in that year are identified as new backdaters, and since Firm 1 was backdating in 1996 it would never be identified as a new backdater in our sample period. In 1996, Firm 2 did not backdate option awards.¹⁰ In 1997, however, Firm 2 begins backdating option awards and is classified as a new backdater. We set an indicator variable equal to one for Firm 2 in 1997, indicating a link to a backdater, because it shares a board member with Firm 1 in 1997 and Firm 1 is identified as previously backdating option grants. In addition, we also compute an indicator variable for general interlocks that measures whether the firm has board links to any other firms, including backdaters. This variable is used to control for general board links in our empirical analysis. These board interlocks and the initiation of backdating are the important linkages we are interested in.¹¹ Finally, in 1998, Firm 1 and Firm 2 have backdated option awards, which makes them ineligible to become new backdaters in our time-series analysis. In this example Firm 3, never backdates its options, even though it is linked to a prior backdater in 1998.

We also gather some additional data from the CD database, such as board size, CEO and board holdings of stock and options, whether the CEO is Chair of the Board,

¹⁰ In order to be eligible for consideration as a new backdater, Firm 2 would have also had to award options in 1996.

¹¹ Note that we also record all other links that a firm has to non-backdating firms as well. We call this the general link indicator.

institutional ownership, CEO age, and information on board independence. We discuss these variable in more detail below.

3.3 Summary statistics on interlocks and backdating

Panel A in Table 2 provides descriptive statistics on firms that are identified as having backdated stock option grants and their board interlocks between 1996 and 2002. For our time-series analysis, we are primarily interested in identifying whether a firm is more likely to begin to backdate option grants if they are connected to firms that are identified as having backdated option grants in prior years. Descriptive statistics on the number of firms identified as initiating backdating in each year of our sample are given in column 3 of Panel A, labeled New BD. Column 2 of the Table reports the cumulative number of firms identified as backdating options over the sample period. Because our sample starts in 1996, the first year a firm can be identified as a new backdater is in 1997. A firm is identified as beginning to backdate option grants in a given year if the firm had option grants in any previous year(s) but none of those previous grants exhibited evidence of backdating, and in the current year, more than 20% of grant-days exhibit the required stock price pattern.¹²

As column 2 in Panel A illustrates, in 1996 we identify 226 firms as having backdated stock option grants in that year and by construction no firms are identified as new backdaters. In 1997, we classify 198 firms as new backdaters. Note that the cumulative number of firms identified as backdaters in 1997 (500 firms) does not equal

¹² We recognize that since we do not have data on options granted prior to 1996 identifying firms that backdate for the first time is a bit problematic. This is why we require that for a firm to be identified as a new backdater they must have given a grant in some prior year or years and none of the prior grants can exhibit evidence of backdating. Although it is possible that some firms in our sample that we identify as new backdaters could have backdated option grants prior to 1996, we feel that any errors in our classification scheme are not likely to be material.

the sum of backdaters identified in 1996 (226 firms) and the newly identified backdaters in 1997 (198 firms). This is because to be classified as a new backdater we also require the firm to grant options with no evidence of backdating in 1996. The additional 76 firms that are identified in 1997 ($500 - 226 - 198$ firms) are firms which exhibit evidence of backdating in 1997, but did not grant options in 1996. The number of firms classified as new backdaters rises in each year between 1997 and 2000, peaking at 390 firms in the year 2000. By 2002, we identify a total of 1,382 firms that exhibit evidence of manipulating the timing of their option grants in that year. Panel B of Table 2 presents data on the number of firms in each year that granted options but do not, according to our definition, exhibit any evidence of backdating option grants. It appears that that practice of backdating spread quickly and significantly over time.

Table 2 also reports statistics on board size and board interlocks for the two subsamples of firms. Firms identified as backdaters have slightly larger average board size, by about 1.5 directors, compared to non backdating firms. A slightly higher fraction of the backdating firms have directors linked to other firms, but the average number of director links is similar across the two groups.

The final three columns in Table 1 compare the frequency and number of director links to firms previously identified as backdaters. Consistent with director interlocks playing a role in the spread of option backdating, firms identified as backdaters have both a higher fraction and larger number of director links to firms previously identified as backdaters. For example, as displayed in Panel A, 53% of the firms identified as backdaters are linked through board interlocks to another firm that backdates in 2000. Similarly, backdating firms have 0.88 director links to other backdating firms in the year

2000, compared to 0.75 director links to backdating firms for non backdaters. Finally, the Table also reports the fraction of firms with links to backdaters through the CEO. Again considering the year 2000, 18% of the backdating firms share an interlock with another backdating firm through a CEO, whereas 16% of non backdating firms share a link through a CEO to other backdating firms.

Table 3 provides summary evidence on the frequency of backdating across different industries based on the 30 industry classifications defined by Fama and French (1997). In over half of the industries in our sample, at least 20% of the firm-year observations exhibit evidence of having backdated option grants. There is also a positive, although not statistically significant, correlation across industries between the fraction of firms identified as backdaters and the fraction of firms with board interlocks to other backdating firms. The widespread nature of the practice across industries is consistent with the notion that board connections play a role in propagating the practice of backdating because board members tend not to sit on the boards of industry competitors.

4. Empirical Results

We begin our analysis in this section with a more formal and detailed examination of the spread of backdating. We first look at how this practice spread over time. We then examine, in the cross-section, the firm and corporate governance characteristics of firms associated with backdating compared to those of non backdating firms. We also provide several robustness tests to confirm our findings.

4.1 The spread of backdating over time through board connections

Multivariate logit regressions are used to identify factors that contribute to the spread of backdating over time. The dependent variable is equal to one for firm-year

observations in which the firm is initially identified as having backdated option grants (what we refer to as a new backdater). In years subsequent to the initial identification as a backdater the firm is removed from the sample. The dependent variable is equal to zero for all firm-year observations prior to the year the firm is identified as a new backdater and for all firm-year observations of firms that are never identified as backdaters during our sample period. This definition of the dependent variable corresponds to a count of the number of firms that begin to backdate options in a given year relative to the population of firms that have not been identified as backdaters up to that point in time. For example, with reference to Table 2, in 1997, we identify 198 firms as new backdaters, and 3,097 firms as non-backdaters. The dependent variable in our regressions is equal to one for the first group and zero for the second. This classification scheme is carried forward through the remainder of the sample period.

Independent variables in our multivariate analysis include a variable we call total board links, which takes on a value of one if the firm has any board links to any other firms in our sample (not just backdating firms) and zero otherwise. To measure whether board links to previously identified backdating firms are important in explaining the likelihood of a firm beginning to backdate its stock options over and above the effect of board links in general, we include a variable that takes on the value of 1 if the board link is to a backdating firm and zero otherwise. For some specifications we use a continuous variable that is the natural logarithm of one plus the total number of board links between firms and the natural logarithm of one plus the total number of board links to backdating firms. Keep in mind that the variable measuring board links to backdating firms requires

that the firm is linked to another firm that has been identified as a backdater in a prior sample year.

We also include firm size measured as prior year total assets and stock return volatility measured as the standard deviation of monthly returns over the prior two years. Firm volatility should be positively associated with the likelihood of backdating because firms are more likely to be able to take advantage of backdating options the more volatile the firm's stock price (See also Heron and Lie (2006)). We do not have any strong priors about firm size, but include this as a control variable. In all of the specifications we include dummy variables for auditors, since there may be certain audit firms that were more likely to allow this practice. We also include dummy variables for each state where firms have their corporate headquarters. The state dummy variables are included to control for the fact that backdating could spread through social networks between firms. We hypothesize that executives at firms locating in similar geographical proximity are more likely to share social connections. Finally we also include year and industry dummy variables in each regression.

We also estimate some specifications that include additional governance characteristics that might be associated with the spread of this practice. The additional variables include board size, CEO age, the percentage of CEO holdings of stock and options, the percentage board holdings of stock and options, the percentage of institutional ownership, an indicator equal to one if the CEO is also chairman of the board, and the proportion of the board consisting of executive directors.¹³ We use board

¹³ The Compact Disclosure database describes board members in term of whether they are insiders or officers of the company. The CD database does not provide any more detail about the characteristics of each of the board members, which is information often provided in the firm's proxy statement. The classification we use from the CD database, however, is also used in other studies including Borokovich,

size to control for the fact that firms with larger boards are more likely to have board links to other firms. CEO age is added to the regressions because younger CEOs are more likely to get larger and more frequent option grants and thus may be more likely to encourage the practice of backdating. We include CEO ownership of stock and options since executives with higher stock and option holdings may be more entrenched and have more control over the board along with the fact that greater option holdings provide more incentive to backdate option grants to increase their value. We include board holdings of stock and options for the same reason.¹⁴ We include institutional ownership because other studies have found that higher institutional ownership is associated with a higher degree of monitoring. If institutions serve as monitors, then firms with higher institutional ownership are less likely to adopt this practice.¹⁵ We include the fraction of board members that are executive directors because the less independent the board the more likely the firm is to backdate.

The results of the regressions are reported in Table 4. The Table reports coefficient estimates as well as marginal effects (reported in square brackets), defined as the implied change in the estimated probability that a firm begins backdating stock option grants corresponding to a change from zero to one in a dichotomous independent variable

Parrino, and Trapini (1996), Agrawal and Knoeber (2001), Kroszner and Strahan (2001), Lehn, Patro, and Zhao (2004) and Linck, Netter, and Yang (2006).

¹⁴ The CD database reports insider holdings as reported in the proxy statement. Many firms include option holdings in these reported ownership numbers. For these firms, the CD database does not distinguish between stock and option holdings.

¹⁵ We do not have a formal theory as to why some of these variables would necessarily be tied to the practice of backdating. To some degree the relation between some of our independent variables and the probability that a firm begins to backdate depends on whether the practice of backdating is opportunistic on the part of the board and executives or whether this practice was used to make option grants more equitable, which a number of firms such as Microsoft have claimed. If backdating is being used opportunistically then we would expect that to the extent that institutions are monitors that the practice would be less frequent. In contrast, if backdating was used by firms to reduce the volatility in the value of the grants across employees hired at different times, then institutions may not have opted to discourage this practice.

or a one standard deviation change in a continuous variable with all other variables in the regression held constant at their sample mean values. In all of the analyses, the p-values, which are reported in parentheses, are based on robust standard errors adjusted for within firm autocorrelation.

The results reported in Table 4 indicate that there is a strong association between the likelihood that a firm begins backdating option grants and having a board member that sits on the board of another firm that is already identified as a backdater. In all of the model specifications, the coefficient estimates on the independent variable measuring links to firms previously identified as backdaters are both statistically (p-values < 0.01) and economically significant. Based on the coefficient estimate in model 2, the marginal effect indicates that having a board link to a firm that has previously backdated option grants increases the likelihood of the firm beginning to backdate grants by 2%. To put this number in perspective, the unconditional probability of becoming a backdater in any particular year in our sample is 7.8%. Consequently, board interlocks to backdating firms account for a little less than one fourth of the unconditional probability that a firm will begin to initiate the practice of backdating stock options. In other specifications with additional control variables, Model 3, the marginal effect associated with board interlocks to a backdating firm accounts for more than half of the unconditional probability that a firm begins to backdate option grants. Similar results are obtained based on the continuous measures of board interlocks – Models 2 and 4. These results strongly suggest that the board interlocks play a significant role in the spread of the practice of backdating.

The likelihood that a firm begins to backdating is also positively correlated with stock-price volatility, CEO holding of stock and options, and inversely related to CEO age. There is some weaker evidence that the initiation of backdating is more likely when the CEO also Board Chair and for firms with smaller boards (although the coefficients are not significant at traditional levels). After accounting for board links to backdating firms, there is no association between the probability of backdating and measures of general board links. Additionally, firm size, board holdings of stock and options, and ownership by institutional investors are unrelated to the likelihood that a firm begins to backdate option awards. We also do not find that backdating is more likely to occur when the board is less independent. Finally, the inclusion of indicator variables for different auditors and states does not affect any of the reported results regarding board interlocks, although, the auditor variables are jointly significant (p-value = 0.09). The geographic indicators are also jointly statistically significant (p-value = 0.03).

To assess the robustness of our results Table 5 repeats the analysis in Table 4 using different criteria to identify backdating firms. Models 1 and 2 use a 20% pre- and post-grant stock price cutoff, while models 4 and 5 use a 5% stock price cutoff. Models 5 and 6 identify backdating firms using only grants to top executives (CEO, President, and Chair of the Board) based on the 10% cutoff for stock price performance. The findings in all specifications are similar to what is reported in Table 4.

4.2 Cross-sectional analysis

In this section, we examine the cross sectional characteristics of firms that backdate relative to non backdating firms. We use a panel data set where backdating varies by year and by firm. For our cross-sectional regressions the dependent variable

takes on the value of one if a firm is identified as backdating options in a particular year between 1996 and 2002. If a firm does not have an option grant that fits our criteria for backdating in a particular year the dependent variable is equal to zero. Similar to the specifications in Table 4 we include a dummy variable that equals one if there is any board link between firms and zero otherwise, a dummy variable that equals one if the board link is to another backdating firm, total assets, the standard deviation of stock returns, along with industry, auditor, state and year dummy variables. In some specifications, we use continuous measures of board links. Additional variables include the board size, a dummy variable if the CEO is also the chair of the board, CEO age, CEO holdings of stock and options, institutional ownership, board holdings of stock and options, and the fraction of board members that are executive directors.

For the most part, across all the different model specifications, the cross-sectional analysis supports our previous findings. We do find some weak evidence that the more total board links the more likely firms are to backdate. One potential explanation for why total board links is significant is that by 2002 we have a large number of firms in our sample that backdate stock options. Consequently, a large number of backdating firms are now linked to other firms. Holding total board links constant, a firm is more likely to be associated with backdating if the firm shares a director with another firm that backdates. Additionally, firms are more likely to backdate the higher their stock price volatility, when boards are smaller, when the CEO is also chair of the board, when the CEO is younger, and when institutional ownership is higher. We find some evidence that the lack of board independence is associated with backdating, which suggests that the practice is more common with less independent boards. Bebchuk et al (2006) and Collins

et al (2006) also find cross sectional evidence that backdating firms have less independent boards. Collins et al also find evidence that backdating is more frequent when the CEO is also Chair of the Board.

Overall our cross-sectional analysis supports our previous findings and indicates that one of the primary mechanisms facilitating the spread of backdating was through board connections to other firms that followed this practice. There is some limited evidence that the practice of backdating is systematically related to measures of poor corporate governance.

5. Conclusion

Boards of directors play an integral role in corporate oversight along with guiding corporate policy and strategy. The purpose of this paper is to provide additional insight into the role that board interlocks play in facilitating the exchange of information and the propagation of corporate practice across firms. Specifically, we examine whether board interlocks appear to be a factor that contributed to the spread of the practice of backdating stock options, a controversial practice that appears to have been widespread. Examination of the practice of backdating of employee stock options provides a unique opportunity to examine the role that board interlocks play in setting corporate policies because the use of this practice was not publicly disclosed by firms.

Our results indicate that the practice of backdating stock options increased significantly over time and spread through a wide range of industries. By 2002, over 40% of the firms in our sample exhibit evidence consistent with the backdating of option grants. More importantly our results indicate that board interlocks appear to be an

important factor in facilitating the spread of this practice. In particular, board interlocks to previously identified backdating firms can explain over one quarter of the unconditional probability that a firm begins to backdate option grants. The likelihood of a firm beginning to backdate stock options is also negatively related to board size and the age of the CEO, and is positively related to stock price volatility and CEO stock and options holdings. As far as we are aware, ours is the first academic analysis of how the practice of backdating spread across firms.

Although we focus on the role that board interlocks play in explaining the spread of the practice of backdating stock options, we believe that our contribution to the literature is deeper. Our analysis indicates that boards operate in complex and dynamic social environments and suggests that recognizing and accounting for this environment is important to understanding how boards function and the role boards play in managerial oversight. Our results also indicate that understanding the role that boards play in determining corporate strategy requires understanding how boards share information through board interlocks and board connections.

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Appendix A

Below we describe the variables and datasets we use in the time series and cross sectional analysis.

For the time series analysis the dependent variable is a dummy variable equal to one if the firm exhibits evidence of stock price performance that is consistent with backdating in the current year and is classified as a non-backdater in the previous year. In other words, the firm backdates for the first time in the current year. All non-new backdating firm year observations are dropped from the time series analysis. For the cross sectional analysis the dependent variable is a dummy variable equal to one if the firm backdated an option award in that particular year. If a firm granted an award and did not backdate according to our criteria the variable is set equal to zero. In order for a grant to qualify as backdated, the stock price must decline by 10% or more in the 20-day period prior to the grant and then increase 10% or more in the 20-day period subsequent to the grant. Logistic regressions are used in all the multivariate time series analysis. For all the analysis the data on option grants and the date they were issued come from the Thomson database. The Thomson database covers option grants at over 8,100 firms between 1996 and 2002. Board data and other governance data come from the Compact Disclosure database. The Compact Disclosure database has information on boards of directors for over 7,000 firms in the same time period. Firms must have a minimum market capitalization of \$25 million. The independent variables are:

Total board links = a dummy variable equal to one if the firm has a board interlock to any other firm in the sample.

Links to backdater = a dummy variable equal to one if the firm has a board interlock to another firm that has previously backdated an option grant.

$\ln(\text{Summed board links})$ = the natural logarithm of the total number of board interlocks to any other firm in the sample.

$\ln(\text{Summed links to backdaters})$ = the natural logarithm of the total number of board interlocks to firms that have previously backdated stock options.

Total assets = the book value of total assets.

Standard deviation of stock returns = the average monthly standard deviation of stock returns over the 24 month period prior to the year of the grant.

Board size = the total number of board members.

CEO is the Chair of the Board = a dummy variable equal to one if the CEO is also chairman of the board.

CEO age = the age of the CEO.

CEO Ownership % = the percentage of outstanding shares and options held by the CEO.

Institutional ownership % = the percentage of outstanding shares owned by institutional investors.

Board ownership % = the percentage of outstanding shares and options held by the board of directors.

Fraction of the board that are executive directors % = the fraction of board members that are executive directors (i.e., insiders or officers).

Industry dummies = dummy variables for each industry. Industry categories follow the Fama and French (1997) 30 industry classification.

Year dummies = dummy variables for each year in the sample. Sample period covers 1996 – 2002.

Auditor dummies = dummy variables for each of the Big 4 audit firms and one for all other audit firms in the sample. Audit firms come from the Compustat database.

State dummies = dummy variables for each state where the firm locates corporate headquarters.

Figure 1

Example of board interlocks and the spread of backdating of stock option awards through time. Firms are represented by numbered rectangular boxes and board members by lettered circles. Gray shading represents a firm that has been identified as a backdater. Lines connect board members to various firms. Interlocks are characterized by connected board members to firms. The first part of the figure illustrates how overlapping board members create interlocks. The second part of the figure illustrates the progression of backdating through time with respect to three interlocked firms.

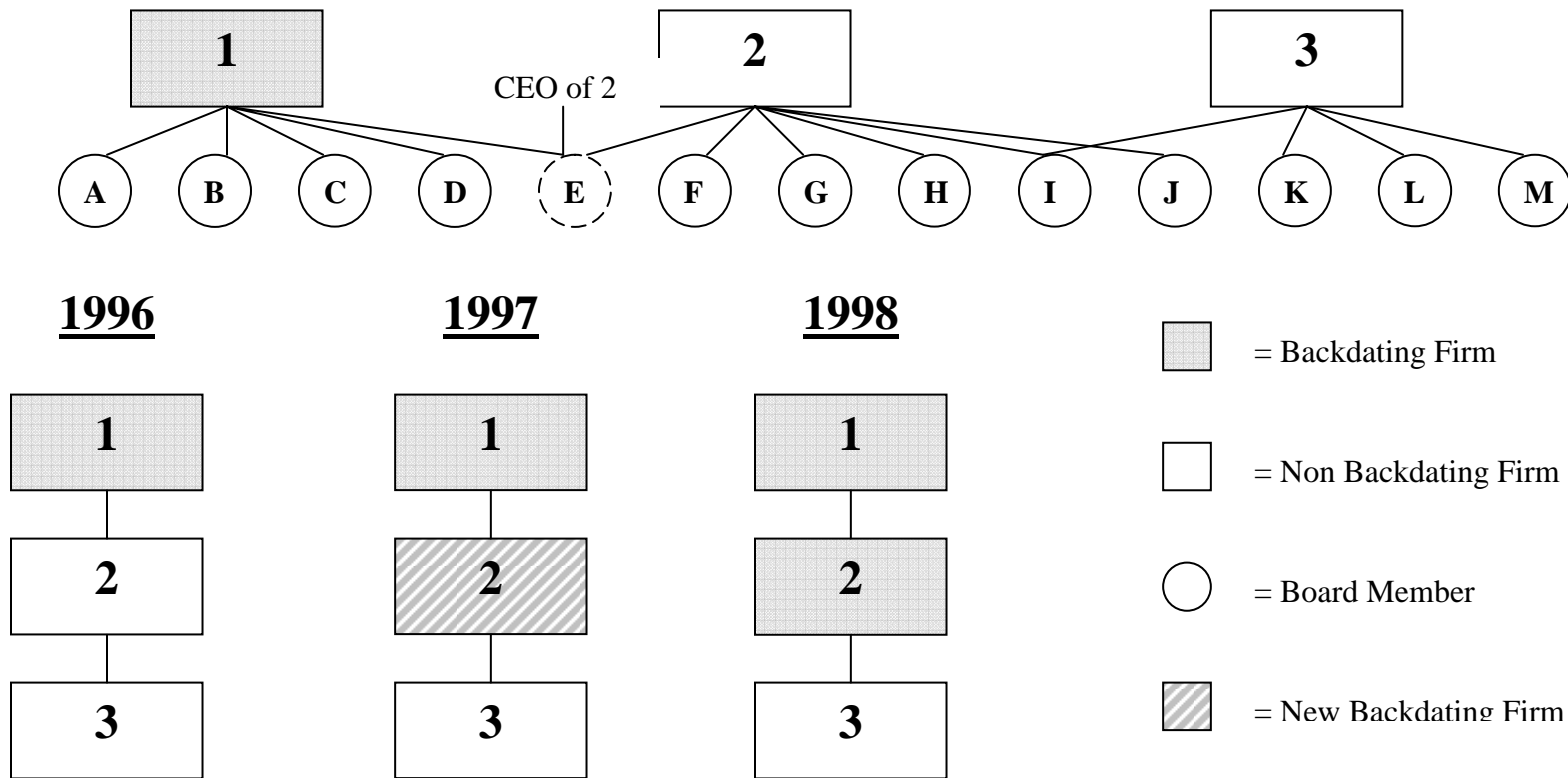


Table 1

Statistics on the frequency of backdating by year using various return cutoffs. Panel A contains the frequency of backdating firms by year using stock return performance cutoffs of 1%, 5%, 10% and 20%. To be classified as a backdating firm the stock returns must have fallen by these various return cutoffs in a 20-day period prior to an option grant and then risen by the same return cutoff in the 20-day period following the grant. Panel B looks at the average stock price performance for firms surrounding an option grant based on three different backdating characteristics. The first category “Before Backdating” examines the stock price pattern surrounding option grants for firms that did not currently fit the definition of backdating but later are classified as having backdated options. The second category “After Backdating” looks at the stock price performance surrounding all the option grants for firms once they are categorized as having backdated. These also include grants that we did not necessarily fit our definition of backdating but were associated with firms that had been identified as backdaters. Finally the third category examines the stock price performance for firms surrounding option grants that are never classified as having backdated. Panel C presents the results of a simulation of randomly chosen dates and the frequency of observations that had stock price performance that is equivalent to the 10% stock price cutoff used in the paper to identify backdating firms.

Panel A – Number of Backdating Firms by Year and Return Level

Year	Firms	20-day Pre and Post Return Level Cutoff			
		1%	5%	10%	20%
1996	3,050	927	485	226	48
1997	3,597	1727	969	500	126
1998	3,756	2121	1315	810	231
1999	3,640	2196	1484	990	279
2000	3,596	2271	1691	1288	452
2001	3,337	2190	1728	1385	549
2002	3,166	1895	1526	1382	458

Panel B - Average Returns Before and After Stock Option Grants

	Grants	20-day Return		p-value Before	p-value After
		20-day Return Before Grant	After Grant		
Before Backdating	6,052	-0.0027	0.0117	0.2076	0.0000
After Backdating	13,615	-0.0729	0.0800	0.0000	0.0000
Non-Backdaters	20,048	-0.0029	-0.0039	0.0038	0.0001
Total	39,715	-0.0269	0.0272	0.0000	0.0000

Panel C - Simulation

Number of Hypothetical Grant Days	477,546
Percent of days that meet -.10, .10 cutoff	5.70%

Table 2

Descriptive statistics on board characteristics and backdating. Summary statistics are given each year on board size, the average number of boards each directors sits on, the percentage and average number of board links that firms have to all other firms in the sample (not just backdaters), the average and percentage number of board links to previously backdating firms, and the average and percentage number of board links to previously backdating firms through the CEO. Panel A presents the number of firms backdating options by year and the number of new firms backdating options each year. In order to be identified as a new backdater the firm must have given an option grant in a prior year that did not exhibit evidence of backdating and then given a grant in the current year that met our definition of backdating. Panel B presents the statistics for firms that are in the sample but do not at any time during the sample period have option grants that identified as meeting the criteria for backdating.

Panel A – Backdating Firms

Year	N	New BD	Board Size	Boards Per Director	Links %	Avg. Links	BD Links %	BD Links	
								Avg. BD Links	via CEO %
1996	226		6.77	1.39	73%	1.62	0%	0.00	0%
1997	500	198	6.97	1.49	79%	1.99	22%	0.28	6%
1998	810	283	7.89	1.50	79%	2.27	36%	0.53	13%
1999	990	251	7.57	1.53	81%	2.44	47%	0.77	17%
2000	1288	390	7.79	1.55	82%	2.60	53%	0.88	18%
2001	1385	242	7.77	1.49	81%	2.38	57%	1.10	22%
2002	1382	118	8.02	1.50	82%	2.54	62%	1.26	24%

Panel B - Non-Backdating Firms

Year	N	New BD	Board Size	Boards Per Director	Links %	Avg. Links	BD Links %	BD Links	
								Avg. BD Links	via CEO %
1996	2824		8.39	1.48	74%	2.52	0%	0.00	0%
1997	3097		8.63	1.54	78%	2.73	14%	0.16	3%
1998	2946		9.62	1.58	80%	3.05	27%	0.38	8%
1999	2650		9.07	1.59	79%	2.96	40%	0.61	13%
2000	2308		9.00	1.54	79%	2.78	45%	0.75	16%
2001	1952		8.85	1.46	74%	2.44	49%	0.99	20%
2002	1784		9.24	1.47	76%	2.64	54%	1.15	21%

Table 3

Descriptive statistics by industry for firms identified as backdating. Industry classifications follow the Fama-French (1997) 30 industry classifications. BD is the number of firms in each industry that are identified as possible backdaters following our definition. BD % is the percent of firms in each industry that backdate. Links % is the ratio of board links to total firms per year. BD Links % is the percent of firms that have links to a firm that backdates and BD Links via CEO % is the percent of firms that have links to a firm that backdates through the CEO of either firm.

Industry	N	BD	BD %	Links %	Avg. Links	BD Links %	Avg. BD Links
Food Products	380	76	20%	90%	4.03	35%	0.79
Beer & Liquor	55	0	0%	98%	4.27	58%	1.50
Tobacco Products	29	5	17%	90%	4.10	41%	0.92
Recreation	465	94	20%	65%	1.92	26%	0.60
Printing and Publishing	297	50	17%	90%	3.57	40%	0.90
Consumer Goods	390	78	20%	78%	3.07	32%	0.67
Apparel	265	80	30%	71%	2.20	31%	0.57
Healthcare, Med. Equip., Pharma.	2381	844	35%	83%	2.52	43%	0.81
Chemicals	424	54	13%	92%	4.14	38%	0.73
Textiles	121	15	12%	81%	2.26	36%	0.59
Construction	634	143	23%	86%	2.93	32%	0.54
Steel Works Etc	363	36	10%	87%	3.07	31%	0.57
Fabricated Products/Machinery	805	185	23%	90%	3.37	38%	0.77
Electrical Equipment	270	69	26%	85%	2.75	38%	0.73
Automobiles and Trucks	289	66	23%	89%	3.46	34%	0.68
Aircraft, Ships, and Railroad	131	13	10%	92%	4.69	44%	0.87
Precious Metals and Mining	124	6	5%	84%	3.47	21%	0.36
Coal	22	4	18%	95%	4.82	36%	0.79
Petroleum and Natural Gas	749	179	24%	81%	2.95	30%	0.62
Utilities	769	44	6%	88%	3.51	33%	0.67
Communication	680	202	30%	79%	3.18	35%	0.72
Personal and Business Services	3324	1604	48%	81%	2.25	44%	0.83
Business Equipment	2790	1264	45%	81%	2.34	43%	0.85
Business Supplies	401	58	14%	89%	3.97	39%	0.86
Transportation	495	94	19%	78%	2.90	34%	0.73
Wholesale	725	224	31%	80%	2.69	34%	0.62
Retail	1300	405	31%	81%	2.83	40%	0.86
Restaraunts, Hotels, Motels	384	67	17%	82%	2.52	27%	0.51
Banking, Ins., and Real Estate	4324	486	11%	59%	2.07	20%	0.41
Everything Else	756	136	18%	75%	2.78	31%	0.59
Total	24142	6581	27%	78%	2.65	35%	0.69

Table 4

Multivariate time series logistic analysis identifying firm and governance characteristics associated with firms that initiated backdating of stock options for the first time. The time series analysis is conducted using the Thompson database to identify backdating firms and the Compact Disclosure base to identify board interlocks and board characteristics. The data covers the time period 1996 to 2002. The dependent variable is one if the firm backdates options for the first time in that given year. Independent variables capture whether the firm has interlocking directors and other firm and governance characteristics. Further description of the dependent variable, independent variables and data sources are provided in Appendix A. The marginal probabilities are provided in brackets. p-values, which are reported in parentheses, are based on robust standard errors adjusted for within firm autocorrelation.

	Model			
	1	2	3	4
Intercept	-2.810 (0.000)	-2.715 (0.000)	-1.038 (0.150)	-0.794 (0.270)
Board Interlocks:				
Total Board Links (1/0)	0.009 [0.001] (0.920)		-0.017 [-0.001] (0.910)	
Links to Backdaters (1/0)	0.238 [0.017] (0.001)		0.469 [0.039] (0.000)	
Ln(Summed Board Links)		-0.086 [-0.006] (0.120)		-0.040 [-0.003] (0.670)
Ln(Summed Links to Backdaters)		0.278 [0.019] (0.000)		0.443 [0.036] (0.000)
Firm Characteristics:				
Total Assets	0.000 [0.000] (0.460)	0.000 [0.000] (0.550)	0.000 [0.000] (0.180)	0.000 [0.000] (0.170)
Std. Dev of Return	3.427 [0.231] (0.000)	3.391 [0.228] (0.000)	2.859 [0.229] (0.000)	2.884 [0.231] (0.000)

Table 4 (continued)

Multivariate time series logistic analysis identifying firm and governance characteristics associated with firms that initiated backdating of stock options for the first time. The time series analysis is conducted using the Thompson database to identify backdating firms and the Compact Disclosure base to identify board interlocks and board characteristics. The data covers the time period 1996 to 2002. The dependent variable is one if the firm backdates options for the first time in that given year. Independent variables capture whether the firm has interlocking directors and other firm and governance characteristics. Further description of the dependent variable, independent variables and data sources are provided in Appendix A. The marginal probabilities are provided in brackets. p-values, which are reported in parentheses, are based on robust standard errors adjusted for within firm autocorrelation.

	Model			
	1	2	3	4
<i>Board and Governance Characteristics:</i>				
Board Size			-0.030 [-0.002] (0.150)	-0.033 [-0.003] (0.150)
CEO is Chair of Board			0.147 [0.012] (0.130)	0.147 [0.012] (0.130)
CEO Age			0.018 [-0.001] (0.001)	0.018 [-0.001] (0.001)
CEO Stock and Option Holdings %			1.278 [0.102] (0.004)	1.277 [0.098] (0.006)
Institutional Ownership %			0.265 [0.021] (0.160)	0.276 [0.022] (0.140)
Board Stock and Option Holdings %			0.502 [0.040] (0.590)	0.524 [0.042] (0.570)
Percentage of Executive Directors on the Board			0.252 [0.020] (0.410)	0.202 [0.016] (0.520)
Industry Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Auditor Dummies	Yes	Yes	Yes	Yes
State Dummies	Yes	Yes	Yes	Yes
Observations	14933	14933	6220	6220
Chi Square	852	827	385	377
Probability of Chi Square	0.000	0.000	0.000	0.000
Pseudo R- squared	0.102	0.102	0.092	0.091

Table 5

Multivariate time series logistic analysis identifying firm and governance characteristics associated with firms that initiated backdating of stock options for the first time. The time series analysis is conducted using the Thompson database to identify backdating firms and the Compact Disclosure base to identify board interlocks and board characteristics. The data covers the time period 1996 to 2002. The dependent variable is one if the firm backdates options for the first time in that given year. Independent variables capture whether the firm has interlocking directors and other firm and governance characteristics. Several different specifications are presented with different performance cutoffs used to identify backdating firms. In the third specifications only grants to the CEO are used to identify backdating firms. In the third specification a 10% stock price cutoff 20-days pre and post grant is used. Further description of the dependent variable, independent variables and data sources are provided in Appendix A. The marginal probabilities are provided in brackets. p-values, which are reported in parentheses, are based on robust standard errors adjusted for within firm autocorrelation.

	20% Stock Price Cutoff		5% Stock Price Cutoff		Grants to CEOs Only	
	1	2	3	4	5	6
Intercept	-5.742 (0.000)	-6.424 (0.001)	-2.340 (0.000)	-2.792 (0.000)	-3.015 (0.000)	-2.911 (0.000)
Total Board Links (1/0)	-0.079 [-0.002] (0.500)		0.159 [0.020] (0.050)		0.005 [0.000] (0.950)	
Links to Backdaters (1/0)	0.317 [0.007] (0.003)		0.123 [0.016] (0.055)		0.273 [0.020] (0.000)	
Ln(Summed Board Links)		-0.196 [-0.004] (0.008)		0.020 [0.003] (0.720)		-0.095 [-0.007] (0.082)
Ln(Summed Links to Backdaters)		0.475 [0.009] (0.000)		0.177 [0.023] (0.008)		0.321 [0.022] (0.000)
Total Assets	0.000 [0.000] (0.610)	0.000 [0.000] (0.980)	0.000 [0.000] (0.580)	0.000 [0.000] (0.930)	0.000 [0.000] (0.420)	0.000 [0.000] (0.520)
Std. Dev of Return	4.370 [0.091] (0.000)	4.023 [0.079] (0.000)	2.458 [0.319] (0.000)	2.524 [0.328] (0.000)	3.655 [0.255] (0.000)	3.609 [0.252] (0.000)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Auditor Dummies	Yes	Yes	Yes	Yes	Yes	Yes
State Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17214	16640	11869	11869	14968	14968
Chi Square	654	718	489	486	754	744
Prob of Chi Square	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R square	0.150	0.163	0.050	0.050	0.093	0.093

Table 6

Multivariate cross sectional logistic analysis identifying firm and governance characteristics associated with firms that are identified as having backdated stock options. The cross sectional analysis is conducted using the Thompson database to identify backdating firms and the Compact Disclosure base to identify board interlocks and board characteristics. The data covers the time period 1996 to 2002. The dependent variable is one if the firm backdated stock options in any given year between 1996 and 2002. Independent variables capture whether the firm has interlocking directors and other firm and governance characteristics. To be classified as a backdating firm the stock price must have fallen at least 10% in the 20-day period prior to the grant and then increases by at least 10% in the 20-day period following the grants. Further description of the dependent variable, independent variables and data sources are provided in Appendix A. The marginal probabilities are provided in brackets. p-values, which are reported in parentheses, are based on robust standard errors adjusted for within firm autocorrelation.

	Model			
	1	2	3	4
Intercept	-0.639 (0.082)	-0.227 (0.550)	0.195 (0.760)	0.286 (0.650)
<i>Board Interlocks:</i>				
Total Board Links (1/0)	0.156 [0.038] (0.017)		0.137 [0.034] (0.170)	
Links to Backdaters (1/0)	0.115 [0.029] (0.011)		0.174 [0.043] (0.006)	
Ln(Summed Board Links)		0.005 [0.001] (0.910)		0.020 [0.005] (0.780)
Ln(Summed Links to Backdaters)		0.178 [0.044] (0.000)		0.229 [0.057] (0.001)
<i>Firm Characteristics:</i>				
Total Assets	0.000 [0.000] (0.310)	0.000 [0.000] (0.420)	0.000 [0.000] (0.590)	0.000 [0.000] (0.530)
Std. Dev of Return	3.515 [0.872] (0.000)	3.492 [0.867] (0.000)	3.118 [0.770] (0.000)	3.130 [0.773] (0.000)

Table 6 (continued)

Multivariate cross sectional logistic analysis identifying firm and governance characteristics associated with firms that are identified as having backdated stock options. The cross sectional analysis is conducted using the Thompson database to identify backdating firms and the Compact Disclosure base to identify board interlocks and board characteristics. The data covers the time period 1996 to 2002. The dependent variable is one if the firm backdated stock options in any given year between 1996 and 2002. Independent variables capture whether the firm has interlocking directors and other firm and governance characteristics. To be classified as a backdating firm the stock price must have fallen at least 10% in the 20-day period prior to the grant and then increases by at least 10% in the 20-day period following the grants. Further description of the dependent variable, independent variables and data sources are provided in Appendix A. The marginal probabilities are provided in brackets. p-values, which are reported in parentheses, are based on robust standard errors adjusted for within firm autocorrelation.

	Model			
	1	2	3	4
<i>Board and Governance Characteristics:</i>				
Board Size			-0.057 [-0.014] (0.000)	-0.059 [-0.014] (0.001)
CEO is Chair of Board			0.146 [0.036] (0.060)	0.143 [0.035] (0.066)
CEO Age			-0.015 [-0.004] (0.002)	-0.015 [-0.004] (0.002)
CEO Ownership %			0.444 [0.110] (0.310)	0.409 [0.101] (0.350)
Institutional Ownership %			0.448 [0.111] (0.002)	0.457 [0.113] (0.001)
Board Ownership %			-0.132 [-0.032] (0.860)	-0.091 [-0.022] (0.900)
Percentage of Executive Directors on the Board			0.425 [0.105] (0.085)	0.399 [0.099] (0.110)
Observations	19453	19453	8658	8658
Chi Square	1561	1579	741	746
Prob of Chi Square	0.000	0.000	0.000	0.000
Pseudo R square	0.143	0.144	0.136	0.136