

# **How Misconduct Spreads: Auditors' Role in the Diffusion of Stock-option Backdating**

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## **Abstract**

I study the role of external auditors in the diffusion of stock-option backdating in the U.S. to explore the role of professional experts in the diffusion of innovative practices that subvert stakeholders' interests. Practices that are eventually accepted as misconduct may emerge as liminal practices—ethically and legally questionable but not clearly illegitimate or outlawed—and not be categorized as misconduct until social control agents notice, scrutinize, and react to them. I examine how the role of external auditors in the diffusion of stock-option backdating changed as the practice shifted from liminality to being illegal and illegitimate. The findings suggest that professional experts' involvement in the diffusion of liminal practices is highly responsive to the institutional environment. Initially, professional experts diffuse these practices via local networks, but when the legal environment becomes more stringent, implying that the practice will become illegitimate, experts reverse their role and extinguish the practice. The larger network remains largely uninvolved in both diffusing and extinguishing the liminal practice until the practice is publicly exposed and labeled as illegal and illegitimate. The findings further show that the diffusion and then extinguishing of backdating before it was outlawed depend on the adopter's geographic proximity to a local office of a complacent expert and on the absence of traceable communication about backdating between these offices. This combination sets the stage for each office to develop independent views about backdating, leading some offices to view backdating favorably and diffuse it, and others to view it unfavorably and curtail it—even at the same time and within the same audit firm. This study contributes to research on the diffusion of misconduct by providing insight into the role of professional experts and the mechanisms and boundary conditions governing that role.

**Keywords:** misconduct, stock-option backdating, financial fraud, diffusion of innovation, professional experts, intermediaries, geography, behavioral strategy

In March 2006, the *Wall Street Journal* published a story that chronicled the implausibly fortuitous timing of stock-option awards at six large companies (Forelle and Bandler, 2006). This story quickly triggered a formal investigation by the U.S. Securities and Exchange Commission (SEC) into the practice of stock-option backdating. Within weeks, the SEC issued rulings explicitly stating that the practice was illegal (McWilliams, 2007), and in a matter of months, dozens of firms were investigated (Wiersema and Zhang, 2013). Class action suits were filed against companies, managers, and audit firms for intentionally deceiving investors on official financial filings (Reilly, 2006; McWilliams, 2007; William, 2011). Some of the wealthiest and most celebrated executives in the world were implicated, including Steve Jobs and Michael Dell. Research has estimated that nearly one-third of U.S. public firms engaged in this form of misconduct between 1996 and 2006 (Heron and Lie, 2009). Investors, regulators, and the media were perplexed when the extent of backdating became clear: how did this particular reporting fraud become so widespread among American corporations?

The case of backdating provides an opportunity to unpack the mechanisms driving the diffusion of misconduct. Although organizational sociologists have long recognized that the normative meaning of a practice can evolve as the practice diffuses (Rogers, 1995; Greve, Palmer, and Pozner, 2010; Palmer, 2012), some practices clearly begin their life as liminal practices—ethically and legally questionable, but neither clearly illegitimate nor explicitly outlawed. These practices emerge in an institutional environment that is unclear about their label or moral standing. The diffusion mechanisms for these practices are therefore likely to change if and when the institutional environment shifts and the implications of adopting them move toward legal and normative certainty. In particular, the role of professional experts as a mechanism of diffusion may shift during this transition.

Professional experts play a key role in the diffusion of many corporate practices, advising firms and helping them implement new practices (Abrahamson, 1991). Like the leaders of the organizations considering practice adoption, professional experts are likely to be sensitive to the costs and risks associated with controversy and contestation over the adoption of a practice (Fiss and Zajac, 2004; Sanders and Tuschke, 2007; Zavyalova et al., 2012). Yet professional experts are also known to be susceptible to motivated blindness if a practice benefits their clients, leading them to approve dubious practices (Bazerman, Loewenstein, and Moore, 2002; Tenbrunsel et al., 2010) and to help clients implement practices in ways that conceal their adoption (Briscoe and Murphy, 2012). These dynamics suggest a changing role for professionals in diffusion as the institutional environment for the practice evolves.

In this paper, I argue that when a practice is liminal and the institutional environment is lax, professional experts will drive diffusion through geographically constrained professional networks, reflecting localized motivated biases in judging the appropriateness of their clients' actions. If and when the institutional environment becomes more stringent, however, professional experts will have incentives to reverse course quickly. In this institutional context, the same experts who were involved in diffusing the questionable practice to clients will likely respond to these institutional changes by extinguishing the practice in their local networks. Ultimately, when the practice is widely discovered and becomes labeled as illegal and illegitimate, the larger network is activated, effectively eliminating the practice from the entire client pool.

To test these predictions, I study how the role of audit firms in diffusing backdating changed as the institutional environment shifted from being lax to more stringent. Stock-option backdating in the U.S. is well suited to studying the diffusion of misconduct. It provides a rare opportunity to observe an entire population at risk, as well as every instance

of adoption, thus circumventing selection problems that have constrained past researchers of misconduct (exceptions include Pierce and Snyder, 2008; Bennett et al., 2013; Graffin et al., 2013; Palmer and Yenkey, 2015; Bianchi and Mohliver 2016; Yenkey, 2017). The recipient, issue date, and strike price of every executive stock-option grant issued in the U.S. is reported, which makes it possible to estimate the likelihood that an award is backdated directly from the data. I can construct a full, unbiased history of the adoption of this practice over its entire life cycle: from the period of high uncertainty about its negative consequences (1996–2002); through the major institutional changes following Sarbanes–Oxley, which sharply reduced uncertainty about the practice’s negative consequences (2002–2006); to the final period, in which it was legally forbidden and heavily penalized (2006–2010).

### **Stock Options and Stock-option Backdating**

The use of stock options in executive compensation grew exponentially during the 1990s, giving rise to the possibility to backdate them (Bebchuk, 2009). The rise in the popularity of stock options can be traced to two rulings in the U.S. tax and accounting codes. The first (APB 25 revision of the 1972 accounting rules) allowed companies not to report stock options issued to executives as an expense if an option was issued at the price the company’s stock was trading. The second (tax code provision 162(m) issued in 1994) made the tax treatment of salaries exceeding \$1 million less forgiving. Taken together, these two rulings increased the attractiveness of issuing stock-option grants, because following the 1994 ruling, stock-option grants issued at the trading price of the companies’ stock (referred to as “at-the-money stock-option grants”) were one way in which executives could be compensated beyond the \$1 million cap without being subjected to the new tax treatment.<sup>1</sup>

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<sup>1</sup> This practice also allows executives to defer tax payments from the day of the grant to the day on which the option is cashed out. For example, if Jane, the CEO of a company trading at \$100 per share, receives 100 options “at the money,” no taxes are due until she exercises the options. If the company’s stock price at that time is \$150, then Jane will receive  $100 \times \$50 = \$5,000$ , on which taxes are due at her marginal rate. But if Jane received the 100 options at a price of \$90,

Stock-option awards are traditionally granted to senior executives by the company's board of directors as a form of incentive pay. The company then reports to investors the number of options, their date, and their price. To enjoy the reporting and taxation advantages mentioned, the price of the options must not be lower than the price of the company's stock on the day they are granted. But option grants were often reported several weeks after they occurred. Executives thus could choose to report a grant as if it were issued on a date when the stock price was particularly low, regardless of when it was actually granted. Doing so would allow them to still report at-the-money stock-option grants, but with a lower strike price, gaining an immediate increase in the value of the grant without having to expense it or pay taxes on it.<sup>2</sup> To be clear, the practice of awarding stock options below the trading price or at an earlier date than the board meeting is not illegal if reported correctly, expensed, and taxed according to proper regulation. Stock-option backdating is the term used to describe misreporting the date of stock-option grants—reporting such grants without proper disclosure.<sup>3</sup> Corporate executives engaging in this practice intentionally report an incorrect date of the stock-option grant on official documents, audited by the firm's auditor and subsequently submitted to the SEC and investors. From a technical standpoint, it seems obvious that submitting official documents containing contrived information is against the law, but it is worth noting that almost all executives who were accused of backdating argued that misreporting the option grant date was not a salient part of the reporting process.

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then she must pay taxes on the difference between the stock price (\$100) and the grant price ( $100 \times (\$100 - \$90) = \$1,000$ ) on the day the options were granted. In addition, she will owe taxes on the gains made ( $100 \times (\$150 - \$90) = \$6,000$ ) upon exercising the options.

2 Additional benefits include making the executive's compensation seem less valuable than it is, which is beneficial in making comparisons with managers in peer firms and in negotiating future compensation packages.

3 Backdating stock options may be legal when the following conditions are met: (1) the firm counts the additional gains received by backdating as a compensation expense; and (2) the firm discloses this practice to the SEC and to shareholders in a timely manner (Wiersema and Zhang, 2013). If individuals or firms fulfill these requirements, however, then they have nothing to gain by engaging in this practice, as it yields the same benefits as awarding straightforward in-the-money option grants. If properly reported, then the additional income would be treated as taxable compensation for the individual, and firms would record the additional gains as expenses, thereby reducing the firms' tax liabilities but not those of the executives.

On July 30, 2002, in the wake of multiple large accounting scandals, the U.S. Congress enacted the “Public Company Accounting Reform and Investor Protection Act,” also known as the Sarbanes–Oxley Act, or SOX (Ribstein, 2002). The new legislation increased the information provided in and transparency required for financial reports (section 302) and established internal auditing processes. Although the legislation did not address backdating specifically, one of its provisions required that all option awards be reported within two days of their grant date. Sarbanes–Oxley was the culmination of a focusing event (Birkland, 1998)—that is, a period that focused public attention on the risks and costs of financial misreporting (Arthaud-Day et al., 2006).

The public was later made aware of backdating after a March 2006 *Wall Street Journal* story chronicled the extremely fortuitous timing of stock-option awards at six large companies (Forelle and Bandler, 2006). In one company, a CEO received six separate stock-option grants shortly before a sharp rise in the company’s stock price. The likelihood of this happening by chance was astronomically low. Academic research confirmed that executives received stock options on favorable dates far more often than chance alone would predict (Lie, 2005; Heron and Lie, 2007; Bebchuk, Grinstein, and Peyer, 2010; Bianchi and Mohliver, 2016). In 2006, following this exposure, the SEC ruled that backdating stock options was illegal under several sections of the Securities Act related primarily to making “untrue statements aimed at defrauding investors by excluding or manipulating information on official reports” (McWilliams, 2007).

Except for a short mention as a secondary charge in a lawsuit on revenue recognition practices of a New York–based company (SEC Release No. 2029 dated June 3, 2004), prior to this 2006 SEC ruling there was virtually no discussion of the practice in the public sphere. But starting in 2006, the SEC and the Justice Department initiated investigations of executives suspected of backdating, resulting in fines to companies, capital market discipline,

and personal liability for executives who were fired, paid personal fines, and even faced criminal convictions (*Wall Street Journal*, 2007; Carow et al., 2009; Wiersema and Zhang, 2013). According to the *Wall Street Journal* (2007), as of late 2007, 141 companies had been investigated for backdating, and most received punitive actions from the SEC. Famously, Comverse Technology CEO Jacob Alexander fled to Namibia following investigations of backdating (Cohn, 2016), and his *Fortune* 500 company devalued rapidly, delisted, changed its name, and exited most of the markets in which it operated (Creswell, 2006).

Although research estimates that that as much as 29 percent of the publicly traded companies in the U.S. participated in stock-option backdating by late 2005 (Heron and Lie, 2009), and despite significant statistical evidence showing that many thousands of executives received implausibly lucky stock-option grants for over a decade, conviction rates were low because investigations found little recorded evidence that the backdating had been officially discussed or formally adopted. Executives who received the grants claimed they were simply lucky, were not directly involved, and did not understand the practice or know it was illegal, shifting the blame to financial officers who were often not the grant recipients (Bebchuk, Grinstein, and Peyer, 2010). Some executives named auditors as responsible for their backdating behavior, but these claims rarely led to indictments (Reilly, 2006).

Backdating diffused so widely in part by spreading across companies through direct contacts between firms. Because backdating was a liminal practice that might eventually be viewed as illegal and illegitimate, firms may have tried to conceal their use of it from the general public (Baker and Faulkner, 1993; Aven, 2015). But direct local connections between firms provide an avenue for information to flow among decision makers who trust one another. Local contacts to prior adopters promote the alignment of opinions (Davis and Greve, 1997) and perceptions of safety in numbers (Ahmadjian and Robinson, 2001), facilitating diffusion. Hence as long as the practice was not unambiguously illegal, locally



proximate networks' peer diffusion was likely to cause limited local diffusion. But trust and the alignment of opinions are sociological processes that exist in interactions that extend beyond those of corporate elites with each other. Sociologists have documented these as general processes that transcend social class and economic status (Erickson, 1988).

Professional experts who interact with each other frequently may just as easily form opinions about the appropriateness of liminal practices. They may then base their advice on those opinions and diffuse these practices to their clients. While theoretically distinct, these local networks of external experts are often nested within local networks of managers in client firms, requiring careful examination of the role experts have in the diffusion of harmful practices independent of other networks that occupy the same space at the same time.

### **Professional Experts and the Diffusion of Liminal Practices**

Professional experts' influence on the diffusion of new organizational practices is shaped by their views of the appropriateness of the new practice and the resulting costs imposed by audiences for adopting it (Abrahamson, 1991; Briscoe and Murphy, 2012). As the history of backdating demonstrates, sometimes these costs are not only unknown but are undetermined for many years. Practices can exist for decades as "gray" (Soltes, 2016) or liminal, not exposed to outsiders or evaluated as clearly appropriate or inappropriate. When new forms of misconduct emerge as liminal practices, their implementation may benefit the organization or its members by circumventing existing rules in a novel way (Merton, 1938; Pierce and Snyder, 2008; Greve, Palmer, and Pozner, 2010; Aven, 2015; Soltes, 2016). External audiences' views about the appropriateness of these liminal practices, and the resulting cost of their adoption, remain undetermined until agents of social control become aware of the practice, scrutinize it, and pass judgment on its legitimacy.

The transition of a practice from legal and ethical liminality to legal and ethical certainty is not abrupt, nor is the change noticed simultaneously by every decision maker in every organization (Soltes, 2016). First, liminal practices or their consequences become topics of public discourse. Then regulators, stakeholders, and the media scrutinize the practice, and their views about its appropriateness are shaped and revealed over time (Tolbert and Zucker, 1983; Abrahamson, 1991; Wiersema and Zhang, 2013). The length of this period in which opinions about the practice and potential penalties for it are decided can vary greatly, ranging from a few weeks, as was the case with the illicit use of expense accounts among British MPs (see Graffin et al., 2013) to many years, as with international tax arrangements (see Cardoso, 2016). In the case of stock-option backdating, uncertainty about the appropriateness of financial statement misrepresentations was sharply reduced by the July 2002 passage of Sarbanes–Oxley, although backdating was not specifically outlawed until it was publicly exposed and the SEC issued its ruling in July 2006 (Leone, 2006).

Numerous studies have found that professional service firms play an important role in spreading innovation (Rogers, 1995; Abrahamson and Fairchild, 1999). Professional service providers have an economic incentive to demonstrate competence and skill to their clients (Ashbaugh, LaFond, and Mayhew, 2003), and their skills are not necessarily confined to practices whose adoption entails no negative consequences. One study found that professional service firms assist companies in concealing the adoption of practices that could potentially result in costly sanctions from employees (Briscoe and Murphy, 2012). For backdating, auditors served as key professional experts responsible for auditing financial statements that included the practice.

Auditors serve as gatekeepers to protect shareholders but are hired by firms' management as external professional experts. Any single audit office therefore is tied to several client firms. Auditors are required to have current and detailed knowledge of rules

and regulations related to financial reporting, and they are also responsible for ensuring the accuracy of a firm's financial statements, a duty that gives them access to a firm's internal practices that relate to reporting. Auditors observe their clients' confidential reports and therefore are well positioned to learn of liminal reporting practices—and then to diffuse them to other clients. Recognizing that this relationship can lead auditors to prioritize their clients' interests over their legal obligations, regulators impose harsh penalties on auditors involved in client malfeasance, as exemplified by the 2002 demise of accounting firm Arthur Andersen (Chaney and Philipich, 2002). Financial markets also impose a cost on audit firms when a client is found to have engaged in reporting fraud. An accounting firm's entire client pool suffers strong reputational damage when one of its clients is implicated in reporting fraud (Firth, 1990; Krishnamurthy, Zhou, and Zhou, 2006; Corona and Randhawa, 2010), creating a strong incentive for a large audit firm to minimize wrongdoing in its client pool.

As an organization, audit firms are often severely penalized for client malfeasance. Yet the individual auditors working for those firms are susceptible to “motivated blindness” stemming from conflicts of interest that bias their moral judgment toward choices that help their clients (Bazerman, Morgan, and Loewenstein, 1997; Bazerman, Loewenstein, and Moore, 2002; Moore et al., 2006; Moore, Tanlu, and Bazerman, 2010; Tenbrunsel et al., 2010). In one controlled lab study, 139 experienced auditors were asked to assess the compliance of the accounting described in five legally ambiguous auditing vignettes (Moore et al., 2003). When the auditors were told they were hired by the company, they were on average 30 percent more likely approve the reports. This aligns with behavioral ethics research delineating boundary conditions to the rational view of ethical decision making, suggesting that auditors will have a more permissive view of liminal practices when they benefit their clients.

Such biases increase when there is ambiguity about the appropriateness of a course of action (Bazerman, Loewenstein, and Moore, 2002), which is often resolved through the decision maker's network (Huckfeldt, Johnson, and Sprague, 2004). One study found that ties to prior adopters resolved ambiguity about the appropriateness of controversial anti-takeover practices (Davis and Greve, 1997). Another found that the social structure around a decision maker influences the likelihood that a firm will announce but never implement stock repurchase programs (Westphal and Zajac, 2001). The resolution of ambiguity about liminal practices is therefore also likely to be influenced by the channels through which the practice is discussed. When liminal practices are not discussed openly over traceable channels, resolving the ambiguity depends primarily on the network structure around the professional decision maker.

Local professional service organizations represent dense communication networks through which private information about liminal practices can flow. Professionals commonly discuss solutions to clients' problems with their colleagues who are physically proximate (Coleman, Menzel, and Katz, 1959). In the accounting profession, local offices are often dense hubs for informal communication about client issues, facilitated by historical traditions of relative local autonomy and variation in organizational expertise across local offices (Ferguson, Francis, and Stokes, 2003). Under such conditions, different local professional offices can develop widely varying perspectives on new and liminal practices such as backdating. In the context of corporate auditing, prior to the passage of Sarbanes–Oxley in 2002, local offices that viewed backdating more permissively had an incentive to “trade” the lenient monitoring of financial statements for additional business by selling non-audit services to their auditing clients.

Before social control agents started paying attention to financial misreporting, these elements created an environment in which external auditors' local offices could form

diverging opinions about the appropriateness of backdating. First, there was no discussion of the practice in official channels, nor any legal rulings or even stakeholder discussion of it, denying auditors valid external signals about its appropriateness. Second, auditors in local offices rarely interacted with geographically distant peers unless they used official or traceable channels, which meant that local opinions could be formed without contestation from distant peers. Finally, auditors had incentives to view favorably any liminal practices that benefited their clients. Thus before the passage of Sarbanes–Oxley, while uncertainty about the legality and cost of adopting backdating was high, some local offices of external auditors viewed the practice favorably and spread it among their clients. This leads to the first hypothesis:

**Hypothesis 1 (H1):** When there is high uncertainty that adopting a liminal practice will be costly, the likelihood that a focal firm will adopt the practice is positively related to the frequency of adoption among firms served by the same local professional office.

The cost of adopting liminal practices is assessed in the context of an institutional environment that signals whether and to what extent a practice would be viewed unfavorably. The passage of Sarbanes–Oxley outlined the allocation of accountability for financial misreporting, increasing the penalties for firms restating their earnings, as well as the likelihood that inaccurate representation of stock-option grants would be severely punished (Arthaud-Day et al., 2006). As experts in financial reporting, auditors were well equipped to correctly evaluate these changes (Ferlie et al., 2005; Rao, Monin, and Durand, 2005).

There are two reasons why professionals may recognize and respond to such changes before their clients do. The first is attention: experts learn details of changes in their domain of expertise well before others do (Hoffman and Ocasio, 2001). For instance, chefs are the first to learn of new cooking techniques (Rao, Monin, and Durand, 2005), lawyers of new legislation (Arnold and Hagan, 1992), and professional sports physicians of new doping

regulations (McKay, 2013). Auditors would have been aware of the detailed changes outlined in Sarbanes–Oxley implying that backdating would be viewed harshly by social control agents.

The second reason is domain expertise, which allows professionals to correctly categorize an innovation in their domain of knowledge. Experts can generalize from a practice to a category and then connect it back to a different practice within that category (Rao, Monin, and Durand, 2005). Thus auditors could generalize from the fraudulent practices that triggered Sarbanes–Oxley, such as certain revenue recognition practices, to a broader category of fraudulent reporting, and from there connect back to misreporting the dates of stock-option awards (backdating). Therefore the uncertainty about the appropriateness and the negative consequences of backdating was reduced for auditors before it was reduced for their clients.

Eliminating the financial incentives of selling non-audit services to clients and clarifying the regulation of financial reporting should have pushed auditors to extinguish the practice of backdating in their client pool. Auditing firms with a high proportion of backdating clients likely responded faster to these changes than firms in which only a few clients backdated because local auditing offices that were most invested in backdating among their clients would be most vulnerable to the penalties associated with the practice. As the number of an auditing firm’s backdating clients increased, so did the likelihood that this transgression would be detected and linked back to the audit office. Furthermore, as the number of clients who backdated increased, so did the likelihood that a local office’s management was involved, and therefore aware of the practice. Generalizing, I hypothesize:

**Hypothesis 2 (H2):** When uncertainty that adopting a liminal practice will be costly is reduced, the likelihood that a focal firm will adopt the practice is negatively related to the frequency of adoption among firms served by the same local professional office.

When practices are exposed and their appropriateness is determined, their liminal state is replaced with certainty about their categorical membership and the cost associated with adopting them. Publicizing the practice's legal and ethical status eliminates variation in the perception of appropriateness between different local offices. Once backdating has been widely reported in the media and the consequences of engaging in it materialize, the role of ties in making firms aware of the practice becomes redundant. The literature on misconduct explains intentional cheating primarily using attributes of the environment or of the organization (Gino, Ayal, and Ariely, 2009; Gino and Pierce, 2010; Gino, Krupka, and Weber, 2013). I do not test these, as the antecedents of intentional fraud that involve organizational and situational characteristics are beyond the scope of this paper and are already well studied (for reviews see Greve, Palmer, and Pozner, 2010; Palmer, 2012; Moore and Gino, 2015).

From a diffusion perspective, however, the implication of publicity is that after backdating was clearly labeled a crime, the adoption of backdating was no longer a function of the adopting actor's ties to experts. Evidence suggests that misconduct generally (and thus backdating) will not be eradicated. Instead, the severity of the punishment will render the practice rare and a function of an actor's characteristics, including the ability to conceal use of the practice from agents of social control (Greve, Palmer, and Pozner, 2010; Pozner and Harris, 2016). Thus once the negative consequences of backdating materialized and became widely publicized in March 2006, the adoption of the practice would not be related to ties to an auditor's local office.

## **Methods**

To detect backdated stock-option grants, I employed a method used in finance to identify instances of unlikely extreme luck (Bebchuk, Grinstein, and Peyer, 2010). Imagine that a

firm's board of directors meets to approve an unscheduled stock-option grant. Because the managers who scheduled the meeting cannot know the stock's price in the days *after* the board meets, that price could increase or decrease following the grant's issuance (Lie, 2005). But if managers are not required to report the grant immediately upon issuance, they can report the meeting as if it happened on a date when the price was especially low. Options reported as if they were granted on the date that reflects the lowest stock price in the reporting window are therefore especially suspicious. Such instances should be rare, but in fact they were extremely common in the sample, indicating that most grants reported on the lowest-price date were backdated (Lie, 2005; Heron, Lie, and Perry, 2007; Bebchuk, Grinstein, and Peyer, 2010). I treated all instances of extreme luck as potential backdating events. Because luck is randomly distributed, any Type I errors (i.e., the inclusion of grants to truly lucky executives) will reduce the significance of estimators but not bias them. In a regression analysis, these randomly lucky grants should not be systematically correlated with any variable on the model equation's right-hand side. The direction of movement in the price of a company's stock in the days following the date when a compensation committee meets is independent of the firm's stock volatility, size, and industry; hence an honest report of a lucky date does not bias the estimation. Furthermore, lucky grant awards are clearly independent of an auditor's past experience with backdating and of the competition between auditors in those markets.

### **Data Sources**

I constructed the sample of backdating firms by closely following the established literature on backdating (Lie, 2005; Heron and Lie, 2007, 2009; Heron, Lie, and Perry, 2007; Bizjak, Lemmon, and Whitby, 2009; Bebchuk, Grinstein, and Peyer, 2010). From the Thomson Reuters Insider Trading data set, I first collected all stock-option grants awarded to company insiders from January 1996 to December 2010. The data include the filings of Forms 3, 4, 5,



and 144 submitted by the company to the SEC. Those forms describe the number, date, and price of stock-option grants awarded to the company's executives and directors. I closely followed the cleaning procedure used in prior research on backdating to verify that the final sample included no records that may have errors in the way they were recorded (Bizjak, Lemmon, and Whitby, 2009; Heron and Lie, 2009; Bebchuk, Grinstein, and Peyer, 2010). In addition, I eliminated grants that appeared to be scheduled—that is, those assigned on the same date in two or more consecutive years (Heron and Lie, 2007).

Backdating was beneficial (and illegal) only when the options were reported as if they had been granted at-the-money. Hence I excluded from the sample all options granted above or below the stock's trading price on the grant day (Bizjak, Lemmon, and Whitby, 2009; Heron and Lie, 2009; Bebchuk, Grinstein, and Peyer, 2010). And because firms often grant option packages to several executives on the same date, which could artificially inflate the number of observations and statistical significance of the regression estimates, I combined all grants issued by the same company on the same date and at the same price into one observation. I collected data on the closing stock price from the Center for Research in Security Prices for each stock in the sample and then matched it to the option's reported price and date. Following Heron and Lie (2007), I checked that the reported price matched the real price of the stock on the day of the reported award. When the two prices nearly matched, but not exactly, I checked a one-day window around the reported date; if the reported price was closer to the real price on one of those days, I assigned the grant to the date on which the prices were more closely matched.

The complete sample includes 56,761 grants given to executives in 5,616 companies over the nine-year period before the practice was exposed in 2006. The sample after the practice was exposed, from March 2006 to December 2010, includes an additional 52,102 grants given to executives in 4,728 different companies.

--- Insert Figure 1 about here ---

Figure 1 illustrates the identification strategy using the stock-option grant issued by Broadcom Corporation in May 2000, an option award that was named in a backdating lawsuit (*Mexico State Investment Council v. Ernest & Young LLP*, 2011). The grant was reported to the SEC as if it had been assigned on May 26, 2000 at a stock price of \$118. As figure 1 shows, the grant represents the lowest price of the stock in the reporting window of one calendar month. Put simply, the identification strategy I used was to treat all similarly fortuitous grants by any company as potentially backdated.

**Geographical clustering of backdated grants: Unit of analysis.** I argue that uncertainty about negative consequences alters the diffusion of a liminal practice by restricting the communication channels through which the practice is propagated. A key component of my theory about the spread of liminal practices is therefore the geographical proximity to peers and professionals who are informed about a practice. To date, the organizational literature has mainly used predefined borders or direct distance measures to test for geographical clustering, e.g., at the levels of city, county, and state. These methods assume either the existence of clustering in the data or a monotonic relation between distance and clustering. For the analysis of the backdating data, I started by testing for the existence of geographical clustering and then estimating the distance over which the clustering occurs. I mapped the location of companies' headquarters at the U.S. county level using the zip codes reported in Compustat; I then employed a hot-spot analysis designed to assess the existence of a geographical contagion component. When events are uncommon, areas with a small number of organizations can exhibit an above-average or a below-average number of incidents simply as a statistical artifact. A hot-spot analysis is therefore useful to assess contagion using a non-parametric, distance-based measure. Details concerning this method are given in the Online Appendix

(<http://journals.sagepub.com/doi/suppl/10.1177/xxxxxxxxxxxxxxxx>); figure A1 is a map showing the location of backdating firms, and figure A3 is the “heat map” output of the contagion analysis. The maps show a lack of significant contagion in locations with a small number of organizations, combined with substantial contagion in densely populated areas, which point to a strong geographical clustering of the practice. Within-cluster homogeneity and between-cluster heterogeneity are maximized over a distance of 500 kilometers (see the Online Appendix for details).

Clustering does not mean contagion, however. Geographical clustering can emerge from mechanisms that do not involve diffusion, including industry clusters, community characteristics, and local-level enforcement. For example, companies cluster by industry for reasons that are exogenous to backdating. Backdating was more prominent in some industries than in others (Heron, Lie, and Perry, 2007), so geographical clustering of backdating could simply reflect industry clusters. To better identify the mechanisms by which backdating spreads, I analyzed instances of backdating using multivariate regression. To address some endogeneity concerns, I used the dissolution of Arthur Andersen as a shock that forced its clients to switch auditors, as I explain in the later discussion of robustness tests.

### **Construction of the Variables**

**Peer effects on backdating.** Following established research on local diffusion, I constructed a variable that captures the proportion of backdating by proximate firms:

$$Backdating\ by\ neighbors = \frac{\sum_{t-2}^{t-1} Backdating_{zt}}{\sum_{t-2}^{t-1} Companies_{zt}}$$

Here  $z$  is the city in which the focal organization’s headquarters is located,  $t$  is the year of the grant award, *Backdating* denotes the firms that backdate their option grants, and *Companies* represents the city’s population of public firms.

**Auditor effects on backdating.** To test H1 and H2, I constructed a variable that captures the proportion of backdating firms served by the auditor’s local office:

$$\text{Backdating by proximate firms with the same auditor} = \frac{\sum_{t=2}^{t-1} \text{Backdating}_{izt}}{\sum_{t=2}^{t-1} \text{Companies}_{izt}}$$

Here  $i$  indicates the audit firm, and  $\text{backdating}_{izt}$  is the number of backdating firms audited by auditor  $i$  in city  $z$  at time  $t$ .  $\text{Companies}_{izt}$  is the total number of firms audited by auditor  $i$  in city  $z$  at time  $t$ .

**Periods.** To test for differences in diffusion when uncertainty about the appropriateness of backdating changes, I split the sample as follows: *High uncertainty*: January 1996–July 2002; this period includes all observed time before passage of the Sarbanes–Oxley Act on July 30, 2002. *Reduced uncertainty*: July 2002–March 2006; this period corresponds to the time between enactment of Sarbanes–Oxley and the *Wall Street Journal*'s publication of an article describing backdating. *No uncertainty*: March 2006–December 2010; the four years following the public exposure of backdating. For robustness, I replicated the analysis excluding one-month, two-month, and three-month windows around the cutoff dates, with similar results.

**Control variables.** Research on backdating has shown that the practice was more prevalent in certain industries and for companies audited by small audit firms (Heron, Lie, and Perry, 2007; Wheeler, Post, and Typpo, 2008; Bizjak, Lemmon, and Whitby, 2009). Backdating, like other forms of executive misconduct, is more likely to occur in firms that are smaller, have weaker governance, and have a more powerful CEO (Bebchuk, Grinstein, and Peyer, 2010). Research on other forms of agency-based misbehavior has suggested that backdating may occur more frequently in successful firms than in struggling ones (Vaughan, 1999; Andreoli and Lefkowitz, 2009; Greve, Palmer, and Pozner, 2010; Palmer, 2012). I therefore included the following control variables.

*Audit firm reputation.* I constructed a dummy variable to proxy for the accounting firm's reputation based on industry-established categories. If an accounting firm was one of the Big 6 before 1998, the Big 5 from 1998 to 2002, or the Big 4 from 2002 onward, then the

indicator was set to 1; for all other accounting firms, it was set to 0. I replicated all models using fixed effects for each independent auditor, using only the Big 5 and the Big 4 categories, and excluding very small accounting firms. The results were similar across these different specifications.

*Size.* This variable is the natural log of the firm's assets as reported in the annual reports from the fiscal year in which the grants were assigned. The data on assets were obtained from Compustat. When I ran the models while using the number of employees as an alternative measure of size, the main results remained unchanged.

*Return on assets.* This variable measures the return on assets calculated using the firm's financial reports for the fiscal year in which the grants were assigned; it is an accounting metric commonly used to compare the firms' profitability, calculated by dividing the firm's net income by its total assets.

*CEO power.* This dummy variable, set to 1 if the firm's CEO was also the chairman of its board and to 0 otherwise, is widely used as a proxy for weak governance, especially with regard to executive compensation (Bebchuk and Fried, 2003).

*Stock price volatility.* This variable captures the standard deviation of the company's stock price during the month of the stock-option grant. Volatile stocks are more likely to be backdated simply because the potential gains from backdating are greater.

*Time trend.* Both the use of stock options to compensate executives and the practice of backdating options increased in popularity during the 1990s and early 2000s. To account for any time-varying trends in the adoption of backdating before 2006, all models included a linear time-trend control.

*Industry.* Backdating was frequently used in the technology sector. Commentators attributed that phenomenon to the popularity of using stock options to compensate lower-level employees, to cultural norms in the industry, and to a variety of other interindustry

factors. Therefore I included industry fixed effects based on two-digit Standard Industrial Classification (SIC) codes in all the models.

### **Analysis**

The dependent variable used to test the hypotheses is categorical. There are several models designed for analyzing categorical dependent variables, each with its own limitations (for reviews see Hoetker, 2007; Wiersema and Bowen, 2009). To facilitate the interpretation and comparability of coefficient sizes across models, I used linear probability models (LPMs) for the main analysis. Imposing a linear function on probability estimators reduces the significance of the estimator but has the advantage of yielding results that are easy to interpret: a one-unit increase in the explanatory variable leads to an increase of  $\beta$  in the dependent variable. I also ran all models using a probit specification and obtained similar results with marginally improved significance. I ran all the models using robust standard errors and allowed for clustering of the error terms at the firm level. This was a conservative model choice. Relaxing the restriction on clustering increased the significance of my results, as did clustering at the manager level.

### **Results**

Table 1 reports the mean, standard deviations, and correlations of all variables used in the regression analysis. Backdated grants are positively correlated with high stock volatility, backdating frequency among proximate firms, and backdating frequency among other clients of the company's auditor. Backdating is negatively correlated with firm size, firm profitability, and the reputation of the firm's auditor.

--- Insert Table 1 about here ---

Table 2 reports the results of the regression analysis, predicting the likelihood that a firm will backdate a stock-option grant as a function of the underlying stock's volatility, CEO

power, firm size, and return on assets in the previous year. The models also include a dummy variable for the *audit firm reputation*, industry fixed effects, and a variable accounting for any time trend in the use of stock-option grants or backdating. Model 1 shows that firms with higher stock volatility are, on average, more likely to backdate. The standard deviation for firm volatility is 1.21, suggesting that firms that are two standard deviations more volatile than average are 2.25 percent more likely to backdate their options. The likelihood of backdating is 7.5 percent, which means that highly volatile firms are almost one-third more likely to backdate stock-option grants than the average firm. The coefficient for firm size is also negative and significant, and a one-unit increase in the log size of a firm is associated with a .5-percent reduction in the likelihood of its backdating. Public firms differ considerably in size; for my sample, the standard deviation for the size variable (logged assets) is 2.21. Firms that are two standard deviations larger than average are 2.5 percent less likely to backdate stock-option grants. It is interesting that neither *CEO power* nor *return on assets* (firm profitability) is a significant predictor of backdating. The coefficient for the variable that indicates the largest accounting firms (*audit firm reputation*) is negative but only marginally significant ( $p < .10$ ), consistent with the literature. The large and reputable accounting firms are marginally less likely to have clients that backdate than the smaller accounting firms are. On average, clients of large accounting firms are 1.3 percent less likely to have backdated stock-option grants than are clients of smaller accounting firms. Finally, there is a small negative time trend in the adoption of backdating. This trend most likely reflects the passage of Sarbanes–Oxley, which drastically reduced the instances of backdating in the sample period’s later years (Heron and Lie, 2007, 2009; Heron, Lie, and Perry, 2007).

--- Insert Table 2 about here ---

Model 2 includes *backdating by proximate firms*, a measure of the frequency of backdating in the city where the focal firm is located, which is traditionally used to explain

the local diffusion of practices. The coefficient for this variable is both positive and significant, but including this measure without controlling for the level of backdating at the local auditor office omits an important variable that is nested within the same geographical level. The frequency of backdating in the auditor's local office is nested within cities, meaning that any increase in the level of backdating through the auditor's local office mechanically increases the number of proximate firms that backdate.

In model 3 of table 2, I replaced the *backdating by proximate firms* variable with a measure of the frequency of backdating in the auditor's local office (*backdating by proximate firms with the same auditor*). The coefficient for this variable is positive and highly significant. As the proportion of backdating under the auditor's local office increases from 0 to 1, the likelihood that the focal firm will backdate increases by 3.9 percent. Model 4 includes both *backdating by proximate firms* and *backdating by proximate firms with the same auditor*, testing the relative importance of these two channels. Including both measures substantially reduces the significance of *backdating by proximate firms* and also reduces the magnitude of its effect and the effect of *backdating by proximate firms with the same auditor*. In this fully specified model, there is only marginal support for local diffusion from proximate firms. An increase in backdating by proximate firms increases the likelihood that the focal firm will backdate by 60 percent (from 7.5 percent to 11.8 percent), but that effect is only marginally significant ( $p < .10$ ). The statistical support for an increase in the level of *backdating by proximate firms with the same auditor* increases the probability of the focal organization backdating by 33 percent ( $p < .05$ ). Thus the results of model 4 suggest that, in a sample that includes the entire time span from inception to exposure of the practice, backdating diffuses not only by peers but also by the local offices of external auditors.

To test H1 and H2, I split the sample into the periods before and after the passage of Sarbanes–Oxley, models 5 and 6, respectively, in table 2. According to H1, while there is



legal ambiguity and high uncertainty about the appropriateness of backdating, the practice will diffuse from local offices of external auditors to their clients, even when controlling for direct diffusion from one firm to another. This hypothesis is supported in model 5. When I include the level of backdating in an auditor's local client pool, however, the channels of direct diffusion from one firm to another is not statistically different from zero. There are several possible explanations for this finding. One possibility is that firms did not discuss the practice with peers during this period. This is a reasonable explanation given that the practice was new and not in managers' domain of expertise. The second explanation is statistical: because auditors are nested in cities, and peer ties are partially overlapping with ties to local offices of auditors, a sufficiently strong auditor effect could mask weaker diffusion channels. The results offer strong support for local contagion from auditors to clients. In model 5, which includes only those grants reported before July 30, 2002, the coefficient for *backdating by proximate firms with the same auditor* is not only positive but also large and highly significant. According to H2, when there is low uncertainty about the negative consequences of backdating, and before the practice is exposed, local offices will extinguish the practice among their clients. I find marginal support for this hypothesis. In the low-uncertainty period between the enactment of Sarbanes–Oxley and the exposure of backdating in the *Wall Street Journal* article, the coefficient for *backdating by proximate firms with the same auditor* is large and negative, but only marginally significant ( $p < .10$ ). Interestingly, the direct diffusion channel predicted by existing literature becomes the main channel for diffusing the practice during this period. The coefficient for *backdating by proximate firms* is large, positive, and significant. Taken together, these results suggest that before Sarbanes–Oxley passed, local offices of external auditors may have been the main channels of diffusion for stock-option backdating. After the legislation was enacted and before the practice was exposed, auditors began to extinguish the practice among their clients. During this period proximate firms

account for all of the propagation of the practice to new adopters. The coefficient for *audit firm reputation* also becomes insignificant after the enactment of Sarbanes–Oxley, suggesting that Sarbanes–Oxley aligned the behavior of local offices with the incentives of corporate headquarters. Following enactment, local auditors discouraged their clients from backdating.

Model 7 in table 2 reports the results of the full model for the period after the *Wall Street Journal* exposé. Consistent with existing wisdom, firms do not adopt a questionable practice if the odds of detection are high and penalties are severe. Prior predictors of backdating lose their significance. Thus proximity to other adopters no longer affects the likelihood of backdating, and neither do ties to local offices of auditors with other backdating clients. The coefficient for *time trend* reverses in this period from its direction in the two preceding periods. With every year that passes following public exposure of the practice, firms are 2.2 percent more likely to award backdated grants ( $p < .05$ ). This result aligns with explanations in the literature on misconduct: firms engage in wrongdoing even if it is categorized and penalties are known, but only if they believe they can avoid inspection or avoid the penalties. As time passes, new ways to backdate stock-option grants without being detected are discovered. Figure 2 illustrates the differences in the coefficients of the effect of *backdating by proximate firms with the same auditor* over the three time periods.

--- Insert Figure 2 about here ---

My arguments suggest that local offices of audit firms were the primary agents in the diffusion and extinguishment of the liminal practice of backdating. To examine the relative importance of local offices compared with the larger auditor network, I ran additional analyses that compared the two directly. In table 3, I replicated models 5 and 6 and incorporated two additional variables: the amount of backdating by firms audited by the same auditor in other locations (i.e., a different local office of the same large audit firm) and the frequency of backdating in the U.S. (i.e., in different cities than the one where the client firm

was headquartered). The coefficients for the city-level variables remain significant and are in the same direction and magnitude as in the versions of models 5 and 6 in table 2.

Furthermore, there is no statistically significant effect due to the extent of backdating under different offices of a given auditor or the backdating by organizations in cities other than that of the focal organization; these results provide further support for H1 and H2. While it was a liminal practice, backdating diffused locally and mainly within client pools of an auditor's local offices, with no evidence for the transmission of the practice across large geographical distances.

--- Insert Table 3 about here ---

### **Robustness Tests**

The empirical results suggest that auditors spread backdating to their clients before the Sarbanes–Oxley Act but that this path changed after the legislation to local propagation through peer networks. But several endogeneity concerns should be addressed. First, the models would generate results supporting H1 if the causality were reversed and clients chose lax auditors based on recommendations from peers. Second, a broader concern is that the model may omit some variable that is correlated with the likelihood that auditors will advise their clients against backdating. For example, a plausible alternative explanation is that firms with a higher appetite for risk choose more lenient auditors and choose executives who take more risks and are more likely to backdate. In that scenario, it would appear as if some auditors spread the practice, when the results are actually driven by systematic differences in the baseline likelihood of their clients to backdate. I address each of these concerns here.

**Selection of auditors.** The results showing that local offices of auditors spread backdating to their clients continue to hold if the causality is reversed and executives share information about auditors who fail to observe backdating. In this scenario, the causal path would run from clients to auditors: rather than auditors spreading backdating to their clients,

client firms inform each other about auditors' (lack of) skills, and some decide to switch to "unwary" auditors. I addressed this selection concern by constructing an 18-year history of auditor and CEO tenure with the company and then testing to see whether CEOs might be influencing auditor selection.<sup>4</sup> I found that the average auditor tenure exceeds the average CEO tenure by seven years ( $p < .0001$ ), suggesting that reverse causality (i.e., CEOs influencing auditor selection) is unlikely.

Another possible explanation for the effect of auditors' local offices on firms' propensity to backdate is that unobserved firm characteristics increase the likelihood that a firm will seek a lenient (or less competent) auditor *and* hire executives who are more likely to engage in controversial compensation practices. This would lead to a spurious correlation between backdating in an auditor's client pool and the likelihood of another client to adopt the practice. To address this alternative explanation, I used the revocation of Arthur Andersen's audit license as an exogenous event. Arthur Andersen's clients were abruptly forced to leave their local auditor and so needed to select new accounting firms. If informed auditors propagate backdating, then one would expect previous ties with an auditor that enabled backdating to survive the switch, because knowledge of the practice was passed to the firm, which may want to continue the practice. Furthermore, that effect should be evident even if the new accounting firm was previously associated with low levels of backdating, because the firm would drive the decision to continue to backdate. An additional implication is that backdating firms will systematically choose lax auditors, so a firm that abandons a high-backdating Arthur Andersen office may choose to move to a high-backdating office of another auditor rather than a low-backdating one.

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<sup>4</sup> I used 18 years because of limited CEO data; the first available comprehensive data on CEO identity are for years *after* 1991. (Reliable auditor data have existed since the early 1980s.) When using a non-matched sample, I found that the average auditor tenure with a company exceeds 20 years.

Table 4 reports the findings of a logistic model predicting backdating by 476 former Arthur Andersen clients after moving to new accounting firms in 2003–2005. Because the results of this model predict changes in behavior within the firm over time, it includes four independent variables: whether the firm backdated before moving to the new accounting firm (*backdate prior*), whether the firm’s previous Arthur Andersen office had at least one standard deviation more backdating clients than other accounting firms (*former auditor high backdating*), whether its current accounting firm has at least one standard deviation more backdating clients than other firms (*current auditor high backdating*), and the number of backdating companies within the focal client’s geographic area (*exposure to other backdaters*).

--- Insert Table 4 about here ---

As the coefficient on *Former auditor high backdating* variable in table 4 shows, a firm’s likelihood of backdating after it switches accounting firms is positively associated with the extent to which its former auditor’s office had a high proportion of backdating clients. This relationship between the likelihood of a firm receiving a backdated grant and the level of backdating in the client pool of their previous auditor is driven mainly by firms switching from “dishonest” auditors (those with a high past frequency of backdating) to “honest” auditors (those with low past frequency of backdating), lending support to the argument that audit firms spread backdating to their clients.

## **Discussion**

This study reveals several new insights about the role of professional experts in the diffusion of organizational misconduct. First, the role of auditors in the diffusion of stock-option backdating changed as the institutional environment became more strict. During most of the 1990s and early 2000s, before the practice was exposed and outlawed, backdating diffused

among clients of auditors' local offices, and thousands of firms were associated with backdated grants (Audia and Yao, 2017). Once the institutional environment became more stringent following the enactment of the Sarbanes–Oxley Act in 2002, auditors started extinguishing the practice of stock-option backdating among their clients. Thus, even though the practice itself did not change, the role that external professionals played in its diffusion changed in response to changes in the institutional environment, switching from diffusing to eliminating the practice. The diffusion of backdating between firms did not stop until the practice was exposed in 2006, but auditors responded to institutional changes and reversed their role in 2002. I argue that this is because auditors could observe the level of backdating in their portfolio of clients and thus experienced stronger behavioral cues once the practice became illegitimate. Additionally, individual auditors interact with each other in their local offices, which allowed savvy auditors to share information about the change in the institutional environment with their colleagues. Auditors also operate in a hierarchical structure, suggesting that the more clients that were involved in backdating, the more senior managers were involved. Notably, none of these three mechanisms that realign auditors' perceptions with the expectations of the environment hold for non-expert peers diffusing the practice. First, a firm experiences only its own history of backdating—it does not bear responsibility for other firms' behavior, the way an auditor does—so an increased frequency of backdating in the firm's network only increases the likelihood that it will view the practice favorably (Davis and Greve, 1997). Second, even if a firm's manager is sophisticated enough to respond to institutional shifts, he or she may or may not share this information with peers (Ahmadjian and Robinson, 2001). Third, increased backdating in the firm's network does not result in more senior executives being involved. Thus peer diffusion becomes less responsive to institutional changes than diffusion through professional experts.

Second, this study's analysis shows that external auditors were involved in the diffusion of the practice, despite prior non-conclusive findings of an "auditor effect" on client backdating. The main difference between prior research and this study is the unit of analysis. My unit of analysis for practice diffusion is the local auditor, while prior studies have tested for an effect at the corporate-affiliation level. Allowing for different local offices of the same audit firm to have different attitudes toward backdating reveals that although the corporate office might not have been involved in diffusing the practice, some local offices were. The larger corporate-level auditor network was activated explicitly only once the practice became public and outlawed. . This finding suggests that the role of professional experts in the diffusion of liminal practices is affected by the organizational structure of the expert firm.

Third, the results of this study support the notion that different actors—those involved in a liminal practice, those whom the practice harms, and social control agents labeling the practice—may not view it in the same way (Stroube, 2017). In a series of 17 background interviews with managers and auditors who were employed during the study period, it became clear that, unlike outsiders exposed to the practice for the first time in 2006, they did not judge backdating to be unambiguously wrongful. All the interviewees attested to knowing colleagues who either benefited from a backdated option or advised others that they should backdate, although none said they were directly involved. It seems that before backdating was outlawed, it was normalized (Vaughan, 1999) and viewed as a legitimate way of doing business. "By 2002, I think backdating was pretty much standard practice," a senior executive with one of the Big 4 accounting firms recalled. The emergent story resonates with recent literature on white-collar crime (Soltes, 2016). It was not that backdating was known to be wrongful but became normalized over time until groups of deviant decision makers perceived it to be a reasonable course of action. Rather, no one—not decision makers, external audiences, or social control agents—had made a decision about the legal and ethical

status of the practice. The ambiguity experienced by those who made practical decisions about whether to adopt backdating reflected its true state of existence: before 2002, backdating may have been suspect but was neither truly legitimate or truly illegitimate.

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### **Supplemental Material**

Supplemental material for this article can be found in the Online Appendix at <http://journals.sagepub.com/doi/suppl/10.1177/xxxxxxxxxxxxxxxxxx>.



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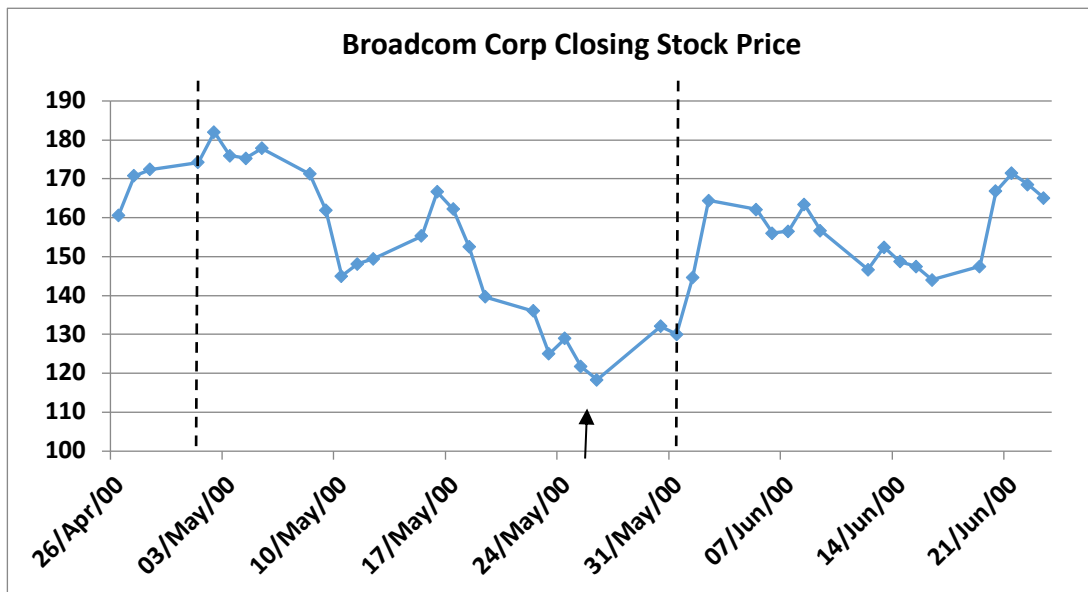
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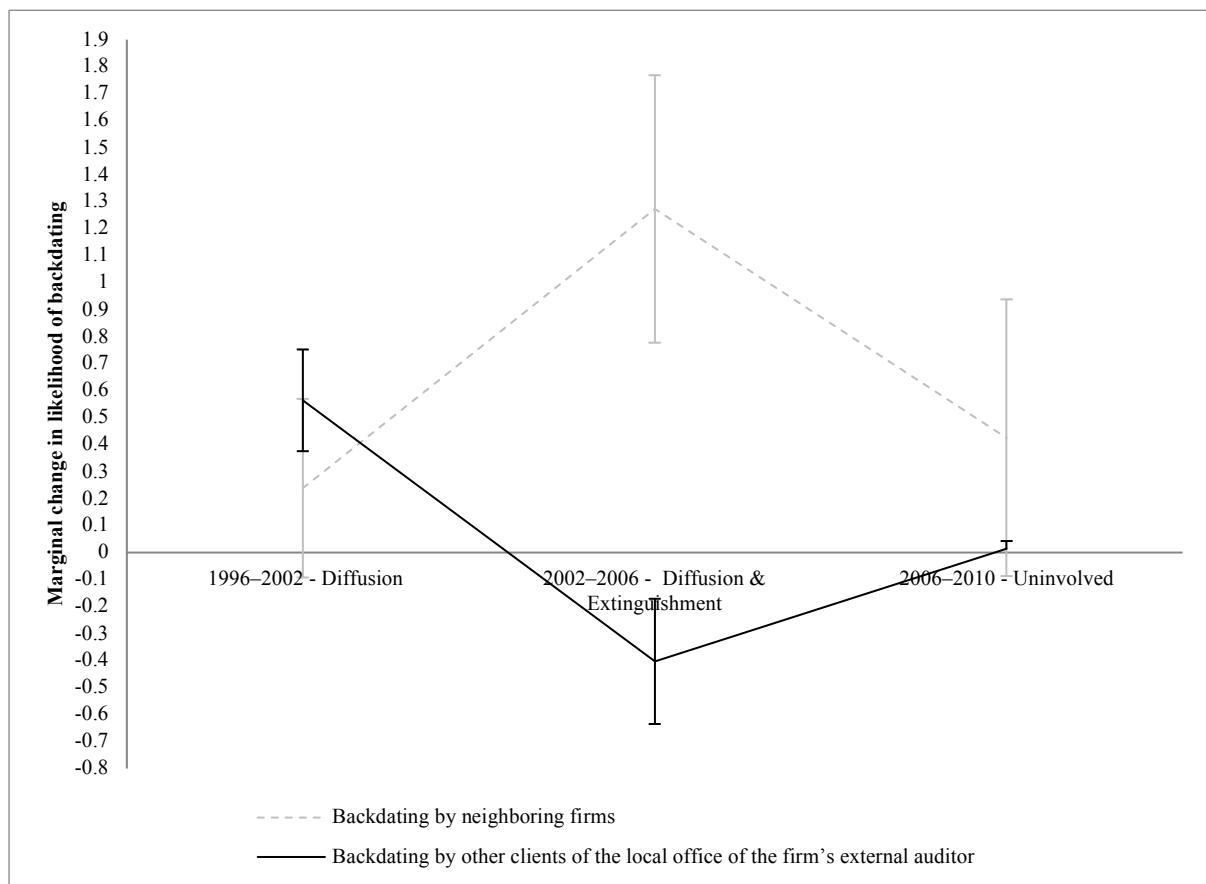
## TABLES AND FIGURES

Figure 1. Broadcom Corp. backdated stock-option grant, May 26, 2000.





**Figure 2. Effects of backdating frequency by proximate firms and by proximate firms with the same auditor in three institutional regimes: high uncertainty (1996–2002), reduced uncertainty (2002–2006), and certainty.**



**Table 1. Correlations and Descriptive Statistics**

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. Backdated stock-option grant	.076	.265											
2. Stock price volatility	1.117	1.217	.033										
3. Year	2001	2	-.035	-.139									
4. CEO power	.191	.393	-.001	.018	-.009								
5. Size (number of employees)	1.501	1.379	-.036	.221	.010	.046							
6. Size (log assets)	6.477	2.220	-.044	.284	.096	.050	.797						
7. Return on assets	-.056	.273	-.012	.159	.006	.014	.326	.402					
8. Named Big 6	.960	.197	-.016	.096	-.069	.019	.154	.222	.080				
9. Backdating neighbors	.082	.074	.028	.020	-.090	-.007	-.076	-.084	-.051	-.008			
10. Backdating: auditor local office	.081	.134	.026	.003	-.049	-.006	-.058	-.065	-.025	-.027	.554		
11. Backdating elsewhere in the U.S.	.081	.010	.035	.139	-.717	.003	-.018	-.077	-.094	.078	.131	.079	
12. Backdating: other offices of the same auditor	.080	.014	.033	.071	-.466	-.004	-.065	-.123	-.096	-.206	.098	.106	.683

**Table 2. Results of Linear Probability Model Predicting Extremely Lucky Grants\***

Variable	(1)	(2)	(3)	(4)	High	Low	Certainty
					uncertainty	uncertainty	(7)
					(5)	(6)	
Stock price volatility	.00935*** (.00127)	.00925*** (.00126)	.00930*** (.00126)	.00926*** (.00126)	.00933*** (.00137)	.00616* (.00290)	.0396 (.0299)
CEO power	.000758 (.00309)	.000846 (.00308)	.000798 (.00309)	.000840 (.00309)	.00255 (.00379)	-.000046 (.00478)	-.00448 (.00369)
Size	-.00545*** (.000764)	-.00533*** (.000760)	-.00534*** (.000759)	-.00530*** (.000758)	-.00611*** (.000937)	-.00388*** (.00117)	.000277 (.000919)
Return on assets	.00330 (.00520)	.00383 (.00519)	.00336 (.00518)	.00367 (.00518)	.00633 (.00618)	.00781 (.00912)	.00885 (.00639)
Audit firm reputation	-.0130+ (.00710)	-.0131+ (.00707)	-.0126+ (.00702)	-.0128+ (.00703)	-.0296** (.0109)	.00276 (.00830)	.00218 (.00503)
Time trend	-.00275*** (.000481)	-.00258*** (.000480)	-.00266*** (.000479)	-.00258*** (.000480)	.000176 (.000931)	-.000412 (.00178)	.00223* (.00113)
Backdating by proximate firms		.0691*** (.0197)		.0430+ (.0223)	.0181 (.0251)	.0966* (.0376)	.0323 (.0289)
Backdating by proximate firms with the same auditor			.0391*** (.0104)	.0261* (.0117)	.0428** (.0143)	-.0306+ (.0176)	.00109 (.00115)
Constant	5.547*** (.964)	5.203*** (.961)	5.354*** (.958)	5.204*** (.960)	-.300 (1.860)	.846 (3.569)	-4.478* (2.259)
Observations	56,745	56,745	56,745	56,745	38,353	18,369	28,552
R <sup>2</sup>	.007	.007	.007	.007	.008	.006	.004
No. firms	5,547	5,547	5,547	5,547	4,912	3,209	3,350

+  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

\* Robust standard errors are reported in parentheses. Industry fixed effects are included in all models.

**Table 3. Results of Linear Probability Model Predicting Backdating from Backdating in Local Offices Not Auditing the Focal Firm\***

Variable	Before Sarbanes– Oxley	After Sarbanes– Oxley
	(5)	(6)
Stock price volatility	.00931*** (.00137)	.00641* (.00292)
CEO power	.00258 (.00380)	–.0005 (.00478)
Size	–.00610*** (.000941)	–.00385** (.00117)
Return on assets	.00631 (.00620)	.00690 (.00915)
Audit firm reputation	–.0239* (.0111)	.00287 (.00892)
Time trend	.000137 (.00101)	–.00653 (.00438)
Backdating by proximate firms	.0194 (.0252)	.0986** (.0375)
Backdating by proximate firms with the same auditor	.0418** (.0144)	–.0308+ (.0176)
Backdating elsewhere in the U.S.	–.291 (.466)	–.827 (.560)
Backdating: Other offices of the same auditor	.254 (.166)	.0181 (.243)
Constant	–.223 (1.999)	13.15 (8.805)
Industry	Yes	Yes
Observations	38,353	18,369
R <sup>2</sup>	.009	.006

+  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

\* Robust standard errors are reported in parentheses.

**Table 4. Changes in Backdating Behavior of Former Arthur Andersen Clients after 2002 (N = 476)\***

<b>Variable</b>	<b>Backdating now</b>
Backdated prior	.691** (.280)
Former auditor high backdating	1.465** (.584)
Current auditor high backdating	-.510 (.634)
Exposure to other backdaters	2.446*** (.442)
Constant	-2.184*** (.190)

\*\* $p < .05$ ; \*\*\* $p < .01$ .

\* Robust standard errors are reported in parentheses.