How Misconduct Spreads:
Auditors' Role in the Diffusion of Stock-Option Backdating

Abstract

This paper explores the role of professional experts in the diffusion of innovative practices that subvert the interests of stakeholders. I do so by studying the role of external auditors in the diffusion of stock-option backdating in the United States. Practices that are eventually accepted as misconduct may emerge as liminal practices, not 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. However, when the legal environment becomes more stringent, implying that the practice will become illegitimate, these offices reverse their role and extinguish the practice. The larger network remains largely uninvolved in both the diffusion, and extinguishment, of the liminal practice.

Keywords: misconduct, backdating, financial fraud, diffusion of innovation, professional experts, intermediaries

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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" (aka, backdating). Within weeks, the SEC issued rulings explicitly stating that the practice was illegal (McWilliams, 2007). 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 (McWilliams, 2007; Reilly, 2006; William, 2011). Some of the wealthiest and most celebrated executives in the world were implicated, including Steve Jobs and Michael Dell. Research estimates that nearly one-third of U.S. public firms had engaged in this particular 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. In particular, 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*, defined as practices that are 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 the practice move toward legal and normative certainty.

This paper examines how the mechanisms of inter-organizational practice diffusion shift as practices transition from liminality to legal and normative certainty. In particular, I focus on the shifting role of professional experts as a mechanism of diffusion 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 practice controversy and contestation (Fiss and Zajac, 2004; Sanders and Tuschke, 2007; Zavyalova et al., 2012). Yet professional experts are also known to be susceptible to motivated blindness, leading them to approve dubious client 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 in diffusion as the institutional environment for the practice evolves.

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. However, if and when the institutional environment becomes more stringent, professional experts will also be incentivized to reverse course quickly. In this institutional context, the same expert networks which were involved in diffusing the questionable practice to clients will become likely to respond to these institutional changes by extinguishing the practice in their local networks. Ultimately, when the practice is discovered and becomes labeled as illegal and illegitimate, the larger network is activated, effectively eliminating the practics 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 lax legislation to a more stringent institutional environment. 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 misconduct researchers (exceptions include Pierce and Snyder, 2008; Bennett et al., 2013; Graffin et al., 2013; Palmer and Yenkey, 2015; Yenkey, 2017). The recipient, issue date, and strike price of every executive stock-option grant issued in the United States is reported, which makes it possible to estimate the likelihood that an award is backdated directly from the data. Thus, backdating is a setting that allows me to construct a full, unbiased history of the adoption of a 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).

The findings from this study contribute 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. The first findings is that before external audiences were exposed to the practice of backdating, it diffused (and later extinguished) through the local networks of professional experts. Only after backdating was exposed to external audiences does the local network stop playing a role in its diffusion. This finding contributes to diffusion and misconduct research by showing that when practices shift from liminality to certainty, the professional experts' networks that diffuse (or extinguish) it shift from local networks to the larger expert network. The second main finding is that, following enactment of Sarbanes-Oxley, professional experts started extinguishing the practice in their local client

pool, while local networks of peer firms continued to diffuse it. This finding contributes to our knowledge of how changes in the institutional environment affect which affiliation network—external experts or non-expert peers—will diffuse practices that subvert stakeholders' interests by showing that when the environment is lax, local networks of professionals diffuse liminal practices and when the environment becomes more stringent, peer networks become the main source of diffusion of these practices. The third main finding concerns how the diffusion of backdating from external auditors to their clients is enabled by the manner in which audit firms organize their production. The diffusion and then extinguishing of backdating depends strongly on the adopter's geographic proximity to a local office of a complacent expert. Audit firms are geographically dispersed professional experts (Kogut and Zander, 1993), and communication channels about practices that could result in large penalties are typically restricted (Baker and Faulkner, 1993; Geis, 1977). This combination of geographically dispersed offices and restricted channels of communication sets the stage for 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 finding advances our understanding of how the organization of production among professional experts influences the spread of harmful practices to their clients (Briscoe and Murphy, 2012; Greve, Palmer, and Pozner, 2010). Because this is a study of the diffusion of stock option backdating over a decade in which the practice is hidden from outsiders, all three findings also contribute to an understudied literature on the diffusion of secrets (Simmel, 1906).

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 those options (Bebchuk, 2009). The rise in popularity of stock options can be traced to two rulings in the American tax and accounting

codes. The first (APB 25 revision of the 1972 accounting rules) allowed companies not to report executive pay as an expense if the 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 (commonly refered 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.[1]

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 the number of options, their date, and their price to investors. 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. However, option grants were often reported several weeks after they occurred. Executives thus could choose to report a grant as if it was issued on a date when the stock price was particularly low, regardless of when they were 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.[2] 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. Rather, stock-option

[1] This practice also allows executives to defer tax payments from the day of the grant to the day in 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 × $50 = $5,000, on which taxes are due at her marginal rate. However, if Jane received the 100 options at a price of $90, then she must pay taxes on the difference between the stock price ($100) and the grant price (100 × ($100 − $90) = $1,000) on the day the options were granted. In addition, she will owe taxes on the gains made (100 × ($150 − $90) = $6,000) upon exercising the options.

[2] Additional benefits include making the compensation of the executive seem less valuable than it is, which is beneficial in making comparison to managers in peer firms, and in negotiating future compensation packages.

backdating is the term used to describe misreporting the date of stock-option grants *without* proper disclosure.[3] Corporate executives engaging in this practice intentionally report an incorrect date of the stock-option grant on official documents, audited by the firms 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 this was not a salient part of the reporting process.

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 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 cost of financial misreporting (Arthaud-Day et al., 2006).

The public was 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 simply thanks to luck was astronomically low. Academic research confirmed that

[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). However, if individuals or firms fulfill these requirements, 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.

executives received stock options on favorable dates far more often than chance alone would predict (Bebchuk, Grinstein, and Peyer, 2010; Bianchi and Mohliver, 2016; Heron and Lie, 2007; Lie, 2005). 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).

Barring 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, however, there was no virtually no discussion of the practice in the public sphere. Following the *Wall Street Journal* article however, the SEC and the Justice Department initiated investigations of executives suspected of backdating, resulting in fines to companies, capital market discipline, and personal liability to executives who were fired, paid personal fines, and even faced criminal convictions (Carow et al., 2009; *Wall Street Journal*, 2007; 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 Comverse Technology, a *Fortune* 500 firm, devalued rapidly, delisted, changed its name, and exited most of the markets in which it operated (Creswell, 2006).

Despite being virtually unknown to regulators, investors, academics, and the media, by late 2005 the practice of stock-option backdating had spread to 29% of the publicly traded companies in the United States (Heron and Lie, 2009). 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 grant recipients (Bebchuk, Grinstein, and Peyer, 2010). Some executives named auditors as responsible for their backdating behavior, but these rarely materialized to indictements (Reilly, 2006).

How did backdating diffuse widely given this evolving institutional backdrop? In part, it spread across companies through direct contacts between firms. As a liminal practice that might eventually be viewed as illegal and illegitimate, firms may have tried to conceal their adoptions 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 alignment of opinions (Davis and Greve, 1997) and perceptions of safety in numbers (Ahmadjian and Robinson, 2001; Ashforth and Anand, 2003), facilitating diffusion. Hence as long as the practice was not unambiguously illegal, locally proximate networks peer diffusion were likely to cause limited local diffusion. However, trust and 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 indeed also form opinions about the appropriatenss of 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 overlay the same space and time.

Professional Experts and the Diffusion of Liminal Practices

The influence of professional experts 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 indeed undetermined for many years. Practices can exist for decades as "gray" (Soltes, 2016) or liminal, not exposed to outsiders, nor 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; Soltes, 2016; Aven, 2015). The views of external audiences about the appropriateness of these liminal practices, and the resulting cost of their adoption, remains undetermined until agents of social control become aware of the practice, scrutinize it and pass judgment about 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). Rather, 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 is shaped and revealed over time (Tobert 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 SOX, although backdating was not publically outlawed until it was 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 (Abrahamson and Fairchild, 1999; Rogers, 1995). Professional service providers have an economic incentive to demonstrate competence and skill to their clients (Ashbaugh, LaFond, and Mayhew, 2003). These skills are not necessarily confined to practices whose adoption entails *no* negative consequences. For example, 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 encompass the backdating practice.

Auditors serve as gatekeepers to protect shareholders but are hired by the firm's management as external professional experts. Any single auditor office therefore is tied to several client firms. Auditors are required to have current and detailed knowledge of rules and regulations vis-à-vis reporting, and they are also responsible for ensuring the accuracy of a firm's financial statements, a duty that gives them access to internal firm practices that relate to financial reporting. Auditors observe their clients' confidential reporting practices, and therefore are well positioned to learn of liminal reporting practices, and diffuse them among their 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 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 a client of that firm is implicated in reporting fraud

(Corona and Randhawa, 2010; Firth, 1990; Krishnamurthy, Zhou, and Zhou, 2006), creating a strong incentive for large audit firms to minimize wrongdoing in its client pool.

Audit firms are penalized heavily by social control agents for client malfeasance, be those regulators or broader market participants, and these penalties are born at the level of the audit firm. Yet, the individual auditors who are in charge of conducting audits to clients are susceptible to "motivated blindness," stemming from conflicts of interest that bias their moral judgment toward choices that help their clients (Bazerman, Loewenstein, and Moore, 2002; Bazerman, Morgan, and Loewenstein, 1997; Moore, Tanlu, and Bazerman, 2010; Moore et al., 2006; Tenbrunsel et al., 2010). In one controlled lab study, for example, 139 experienced auditors were asked to assess the compliance of the accounting described in five ambiguous auditing vignettes (Moore et al., 2003). When the auditors were told they were hired by the company, they were, on average, 30% more likely approve the reports. Thus 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 these benefit their clients.

Such biases increase when there is ambiguity about the appropriateness of a course of action (Bazerman, Loewenstein, and Moore, 2002). Ambiguity about the appropriatness of an action is often resolved through the network of the decision maker (Huckfeldt, Johnson, and Sprague, 2004). For example, 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, resolution of this ambiguity depends primarily on the structure of the network 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 client problems and dealings with colleagues that are physically proximate (Coleman, Menzel and Katz, 1959). In the profession of accounting, 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. Further, in the context of corporate auditing, prior to the passing of Sarbanes-Oxley Act in 2002, local offices that viewed backdating more permissively had an additional incentive to "trade" lenient monitoring of financial statements for additional business from non-audit services sold by the same office to their auditing clients.

Before social control agents started paying attention to financial misreporting, these elements created an environment in which local offices of external auditors 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 appropriatness. Secondly, auditors in local offices rarely interacted with geographically distant peers without using official or traceable channels, allowing local opinions to be formed without contestation from distant peers. Lastly, auditors had incentives to view liminal practices that benefited their clients favorably. Taken together, this suggests that before the passage of the Sarbanes-Oxley Act, 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.

Hypothesis 1: 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 on the background of an institutional environement that signals whether, and to what extent, a practice would be viewed unfavourably. The passage of SOX focused public attention on financial misreporting, and the legislation outlined the allocation of accountability for financial misreporting. The penalties for firms restating their earnings increased, as did 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 these changes before their clients. 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, 2015). Auditors therefore would have been aware of the detailed changes that would imply that backdating would be viewed harshly by social control agents.

The second reason is domain expertise, which allows professionals to correctly categorize an innovation within their domain of knowledge. In particular, experts can generalize from a practice to a category and then back to a different practice within that category (Rao, Monin, and Durand, 2005). Thus, auditors could generalize from the fraudulent practices that triggered SOX (for example, certain revenue recognition practices) to a broader category of fraudulent reporting, and from there to reporting the wrong dates of option awards (backdating). Therefore, the uncertainty about the appropriatness, and the

negative consequences of backdating was reduced for auditors before it was reduced for their clients.

Severing the financial incentives of non-audit services and clarifying the regulation of financial reporting pushes auditors to extinguish the practice in their client pool. Offices with a high proportion of backdating clients would respond faster than offices in which only a few clients backdate. Local professional offices that are most invested in backdating among their clients will also be most vulnerable to the costs associated with the practice. As the number of backdating clients increases, so does the likelihood of detection of this transgression and linking it back to the auditor office. Furthermore, as the number of clients who backdate increases, so does the likelihood that the management of the local office will be held responsible if the practice is discovered.

Hypothesis 2: 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 appropriatness is determined, their liminal state is replaced with certainty of their categorical membership and the cost associated with adopting them. Publicity of the legal and ethical status of a practice eliminates variation in the perception of appropriatness 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 excellent reviews on the drivers of wrongdoing in organizational settings, see Greve, Palmer, and Pozner, 2010; Moore and Gino, 2015; and Palmer, 2012).

From a diffusion perspective, however, the implication of publicity is that after backdating is clearly labeled a crime, adoption of backdating will no longer be 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 actor characteristics, including the ability to conceal use of the practice from agents of social control (Greve, Palmer, and Pozner, 2010; Pozner and Harris, Forthcoming). Thus, once the negative consequences of backdating materialize and become widely publicized in March 2006, the adoption of the practice will not be related to ties to an auditor's local office.

Data and Measures

Method of Identifying Backdated Stock-option Grants

To detect backdated grants, I employ 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 issuance of the grant (Lie, 2005). However, recall from the earlier discussion that managers are not required to report the grant immediately upon issuance; hence, they can report the meeting as if it happened on a date when the price was especially low. Options that are reported as if they were granted at the date that reflects the lowest stock price in the reporting window are therefore especially suspicious. Such instances should be rare, but in fact were extremely common in the sample, indicating that most grants reported on the lowest-price date were indeed 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 truly lucky executives) will only reduce the significance of estimators but not bias them. In the following section, I detail the process I used to identify these instances of extreme luck.

Data Sources

I constructed the sample of backdating firms by closely following the established literature on backdating (Bebchuk, Grinstein, and Peyer, 2010; Bizjak, Lemmon, and Whitby, 2009; Heron and Lie, 2007; Heron and Lie, 2009; Heron, Lie, and Perry, 2007; Lie, 2005). 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 executives and directors in the company. I followed closely the cleaning procedure used in prior research on backdating to verify that the final sample included no records that were input with error (Bizjak, Lemmon, and Whitby, 2009; Heron and Lie, 2009; Bebchuk, Grinstein, and Peyer, 2010). In addition, I eliminated grants that appear to be scheduled – that is, those assigned on the same date in two or more consecutive years (Heron and Lie, 2007).

As discussed in my description of the research context, 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 (Bebchuk, Grinstein, and Peyer, 2010; Bizjak, Lemmon, and Whitby, 2009; Heron and Lie, 2009). 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, then I assigned the grant to the date on which the prices 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 is 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 diffusion by restricting the communication channels through which a 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 backdating. 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 Appendix A. Figure 2a is a map showing the location of backdating firms, and Figure 2b is the "heat map" output of the contagion analysis. The lack of significant contagion in locations with a small number of organizations, combined with the substantial contagion in densely populated areas, points to a strong geographical clustering of the practice. Within-cluster homogeneity and between-cluster heterogeneity are maximized over a distance of 500 kilometers (see Appendix A for details).

--- Insert Figures 2a and 2b about here ---

However, clustering does not mean contagion. 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 multi-variate regression. To address some endogeneity concerns, I use the dissolution of Arthur Andersen as a shock that forced its clients to switch auditors.

Construction of the Variables

Peer effects on backdating. Following established research on local diffusion, I construct 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 Hypotheses 1, and 2, I construct a variable that captures the proportion of backdating firms served by the auditor's *local* office:

$$Backdating\ by\ proximate\ firms\ with\ the\ same\ audito = \frac{\sum_{t-2}^{t-1} Backdating_{izt}}{\sum_{t-2}^{t-1} Companies_{izt}};$$

Here subscript *i* indicates the audit firm. $Backdating_{izt}$ is the number of backdating firms audited by auditor *i* in city *z* at time *t.* $Companies_{izt}$ is the total number of firms audited by auditor *i* in city *z* at time *t*.

Periods. To test for difference 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 SOX and the *Wall Street Journal*'s publication of an article that described the backdating practice.

No uncertainty: March 2006 – December 2010. The four years following the exposure of backdating.

For robustness, I replicate the analysis excluding one-month, two-month, and three-month windows around the cut off 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 (Bizjak, Lemmon, and Whitby, 2009; Heron, Lie, and Perry, 2007; Wheeler, Post, and Typpo, 2008). 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 suggests that backdating may occur more frequently in successful firms than in struggling ones (Andreoli and Lefkowitz, 2009; Greve, Palmer, and Pozner, 2010; Palmer, 2012; Vaughan, 1999). 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 the models were run 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 profitability of firms. *Return on assets* is calculated by dividing the firm's net income by its total assets.

CEO power. This dummy variable was set to 1 if the firm's CEO was also its chairman of the board (and was set to 0 otherwise). *CEO power* 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, cultural norms in the industry, and a variety of other inter-industry factors. Therefore, in all the models, I included industry fixed effects based on two-digit Standard Industrial Classification (SIC) codes.

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 excellent reviews, see Hoetker, 2007; Wiersema and Bowen, 2009). To facilitate 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 explanatory variable leads to an increase of β 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 (i.e., lucky) grants are positively correlated with high stock volatility, backdating 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 auditor's reputation (*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 0.5 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 and 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 passage of Sarbanes-Oxley, which drastically reduced the instances of backdating in the sample period's later years (Heron and Lie, 2007; Heron and Lie, 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 that is traditionally used to explain local diffusion of practices. The coefficient for this variable is both positive and significant ($\beta = .067$, $p < .001$). However, as discussed earlier, 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 3, I replace 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, it diffuses not only by peers but also by the local offices of external auditors.

To test Hypotheses 1 and 2, I split the sample into the periods before and after passage of the Sarbanes-Oxley Act (Models 5 and 6, respectively, in Table 2). According to Hypotheses 1, 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. Interestingly, once I include the level of backdating in the local client pool of an auditor, 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 when one considers that the practice was new and not in the expertise domain of managers. The second explanation is statistical: because auditors are nested within 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 indeed 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 (β = .042, p < .01). According to Hypothesis 2, 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 hypothesis 2. In the period between the enactement of Sarbanes-Oxley and the exposition of backdating in the *WSJ* article, the coefficient for *Backdating by proximate firms with the same auditor* is large and negative, and maringally significant (β = -.03, p < .1). Interstingly, 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 highly significant (β = .096, p < .05). 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 enactement of Sarbanes-Oxley. This outcome suggests that Sarbanes-Oxley aligned the behavior of local offices with the incentives of corporate headquarters. Following SOX, local auditors discouraged their clients from backdating.

Model 7 in Table 3 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 exposure of the practice, firms are 2.2 percent more likely to award lucky grant ($p < .05$). 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 grant lucky without being detected options are discovered. Figure 3 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 3 about here ---

My arguments suggest that local offices of audit firms are the primary agent in the diffusion and extingushment of liminal practices. To examine the relative importance of local offices compared with the larger auditor network I run additional analysis that compare the two directly. In Table 3, I replicate Models 5 and 6 and incorporate 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 United States (i.e., in different cities than the one where the firm is headquartered). The coefficients for the city-level variables remain significant and are in the same direction and magnitude as in the Table 3 versions of Models 5 and 6. Furthermore, there is no statistically significant effect due to the extent of backdating under different offices of a given auditor or to the backdating by organizations in cities other than that of the focal organization; these results provide further support for Hypotheses 1 and 2. While it was a liminal practice, backdating diffused locally and mainly within client pools of an auditors' local offices.

--- Insert Table 3 about here ---

Robustness Tests

The empirical results suggest that auditors spread backdating to their clients before Sarbanes-Oxley but that, after the legislation, this path changed to local propagation through peer networks. However, there are several endogeneity concerns that should be addressed. First, the models would generate similar outcomes if the causality was reversed and clients chose lax auditors based on recommendations from peers. Second, a broader concern is that the model may omit a variable that is itself 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, as well as executives who are more risk taking and 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. Finally, the identification of backdated stock-option grants captures some grants that are, in fact, simply lucky. I will address each of these concerns in turn.

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 choose auditors.[4] I found that

[4] 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.

auditor tenure exceeds CEO tenure by almost seven years ($p < .0001$), suggesting that reverse causality (i.e., CEOs choosing auditors) is unlikely.

Spurious Causality, Selection of Auditors by Board Members, and Joint Selection of Auditors and CEOs by Companies

Another possible explanation for the effect of auditors' local offices on the propensity of firms 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 high-risk 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 a new accounting firm. If informed auditors propagate backdating, then one would expect previous ties with an auditor that enabled backdating to survive the switch (since knowledge of the practice was passed to the firm). Furthermore, that effect should be evident even if the new accounting firm has previously been associated with *low* levels of backdating. An additional implication is that backdating firms systematically choose lax auditors. Thus, in support of the alternative explanation, a firm that abandons a high-backdating Arthur Andersen office will choose to move to a high-backdating offices of another auditor rather than a low-backdating one.

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. Since this model predicts changes in behavior within the firm over time, the models include 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 Table 4 shows, a firm's likelihood of backdating after it switches accounting firms depends on the extent to which its former accounting firm was associated with a high proportion of backdating clients. This relationship is driven mainly by firms switching from "dishonest" auditors (those with high past frequency of backdating) to "honest" auditors (those with low past frequency of backdating). Thus, the levels of backdating under the firm's previous auditor is a significant predictor of future backdating behavior, lending support to the argument that audit firms spread backdating to their clients.

Randomly Lucky Grants

Some executives will "get lucky" in the timing of their grant awards. 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 companies 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. Because luck is randomly distributed, such observations add noise to the models but do not bias the estimators.

Discussion and Conclusion

This study explores the role of professional experts in the diffusion of organizational misconduct, through an analysis of the role of external auditors in the diffusion of stock-option backdating among U.S. corporations. The analysis reveals several new insights. First, the role of auditors in the diffusion of 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 local offices of auditors. During this period, 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, the diffusion coefficient of backdating among auditor clients reverses as auditors start extinguishing the practice. Thus, even though the practice itself did not change, the role external professionals played in its diffusion changed in response to changes in the institutional environment, switching from diffusion to extinguishment. Indeed, the diffusion of backdating between firms did not stop until the practice is exposed in 2006. However, auditors respond to institutional changes and reverse their role in 2002. I argue that this is because auditors can observe the level of backdating in their portfolio of clients, thus experiencing stronger behavioral cues once the practice becomes illegitimate. Additionally, auditors communicate within office, allowing savvy auditors to inform others that the institutional environment changed. Lastly, auditors operate in an hierarchical structure, suggesting that the more clients are invovlved in backdating, the more senior managers are involved. Notably, none of these three mechanisms that re-allign auditor's perceptions with the expectations of the environment hold for non-expert peers diffusing the practice. Firstly, a firm only experiences its own history of backdating, so increased frequency of backdating in the firms network only increases the likelihood that it will view the practice favorable (Davis and Greve, 1997). Secondly, if a manager of a firm is sophisticated enough to respond to

institutional shifts, there is no reason that she will share this information with her peers (Ahmadjian, and Robinson, 2001). Thirdly, increased backdating in the firms 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, the 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 the analysis in prior research and the one in this paper is the unit of analysis. In this study, the unit of analysis for practice diffusion is the local auditor, while prior studies test 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 while the corporate office might not have been involved in diffusing the practice, some local offices were. The larger, corporate-level auditor network was only activated, explicitly, once the practice became public and outlawed. Lastly, the findings are aligned with the idea that practices that are deemed wrongful are not viewed the same way over time (Soltes, 2016).

Third, the results of this study are aligned with the notion that different actors (those involved in the practice, those which the practice harms and social control agents labelling the practice) may not view it in the same way (Stroube, 2017). In a series of background interviews with managers and auditors who were employed during the study period, it became clear that, unlike outsiders exposed to the practice in 2006, they did not judge backdating to be unambiguously wrongful. Every one of the 17 interviewees attested to knowing of colleagues who either benefited from a backdated option or advised others they should backdate, although none said they were directly involved. It seems that before backdating was outlawed, it was indeed 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 (Vaughan, 1999) until groups of deviant decision makers perceived it to be a reasonable course of action (Emerson, 1988). Rather, no one—not decision makers, external audiences, nor 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 or not to adopt backdating reflected a true state of existence: before 2002, backdating was not, in fact, wrongful, contested, or legitimate.

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TABLES AND FIGURES

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

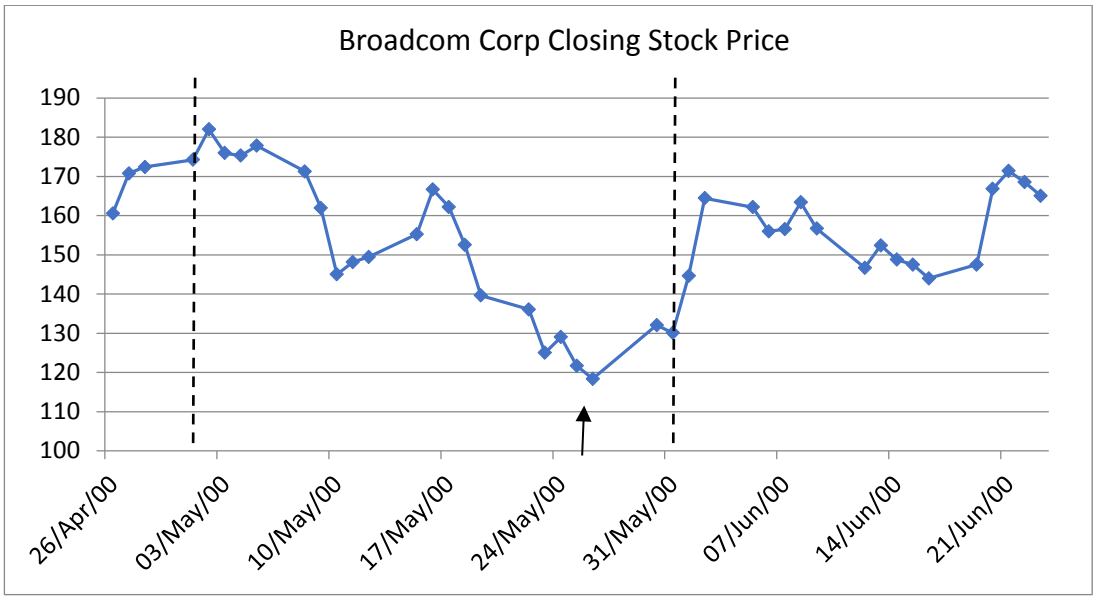


Figure 2a. Headquarter locations of sample firms.

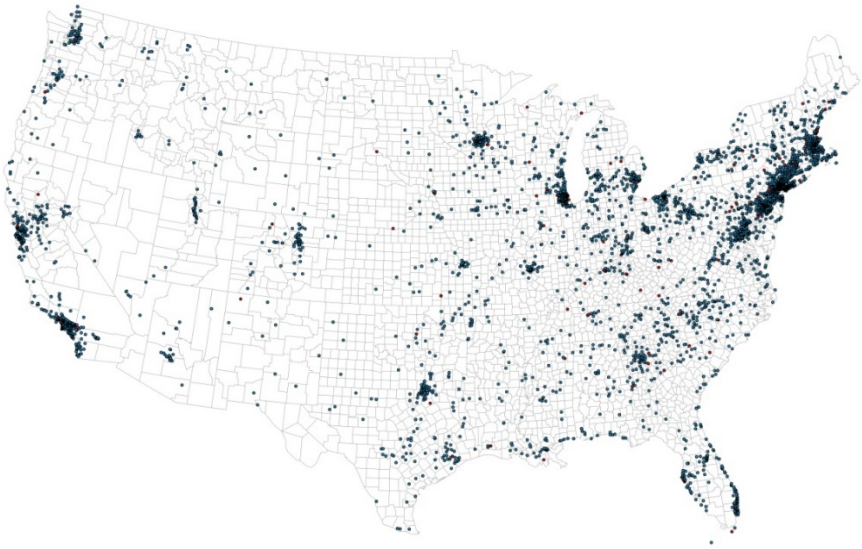
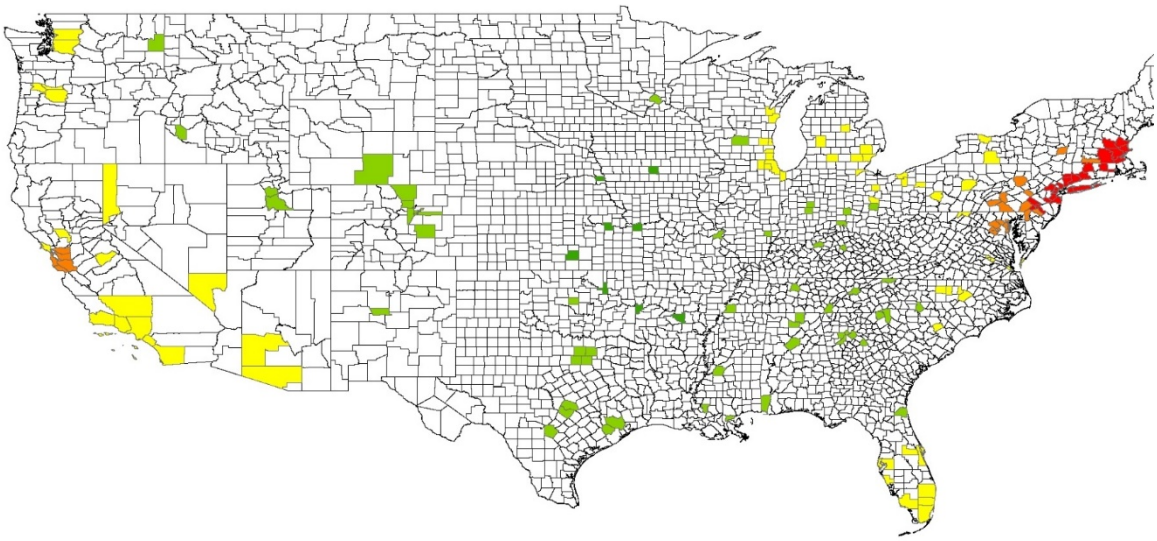


Figure 2b. Backdating hot spots.



Note: Figure 4a shows the location of companies that awarded stock-option grants between 1996 and 2005; this mapping is based on the city–state identifier from Compustat records. The map in Figure 4b illustrates county-level results of the Getis-Ord Gi* statistic of spatial autocorrelation. The weight matrix was chosen to maximize the *Z*-score at 500 km level such that every company in the 500km radius from the focal company has a weight of 1 on proximate firm effect; beyond that distance, the effect diminishes exponentially with distance from the focal company. The map shows clusters that are significant (at the $p < .001$ level and above) aggregated at the county level.

Figure 3. Effects of backdating frequency by proximate firms, and proximate firms with the same auditor in three institutional regimes: high uncertainty (1996-2002), reduced uncertainty (2002-2006), and certainty.

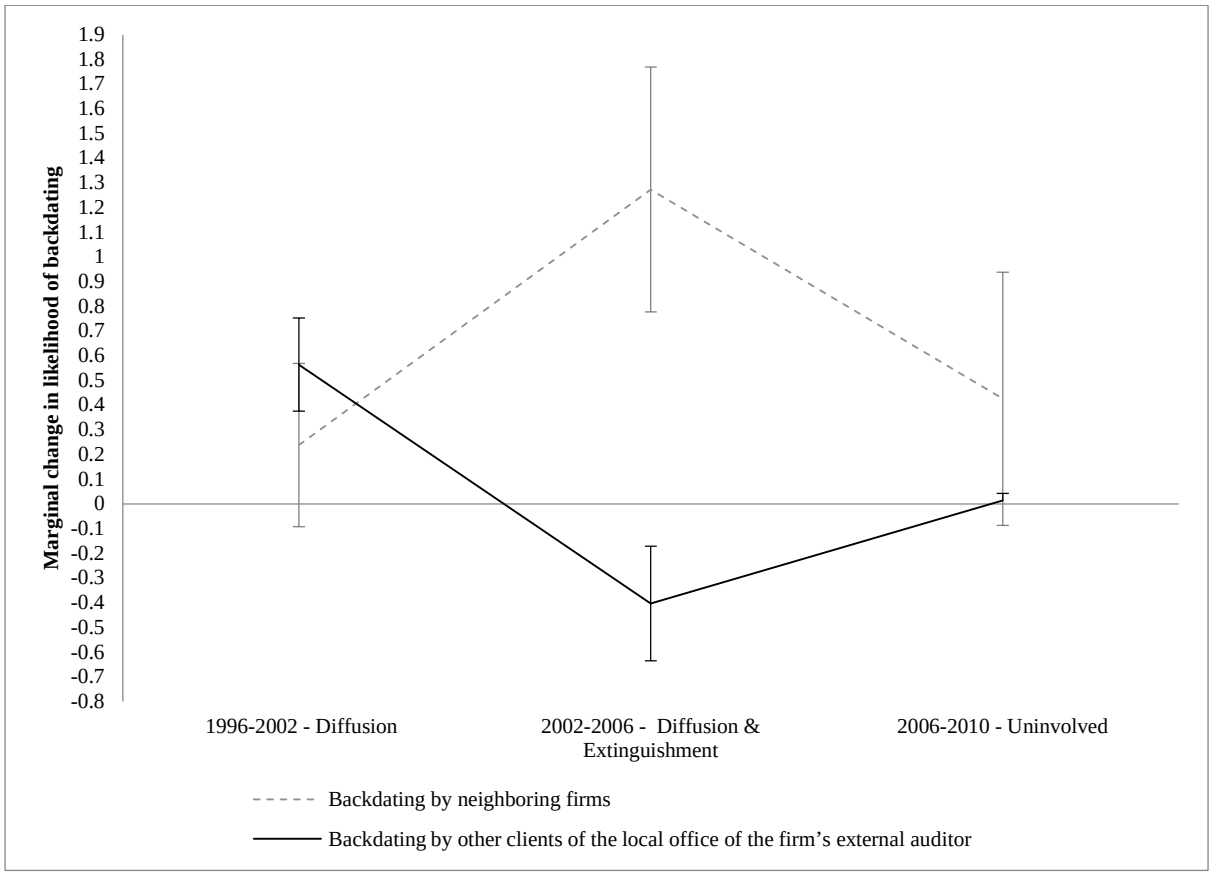


Table 1

Correlations and Descriptive Statistics

		Mean	S.D.	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
[1]	*Backdated stock-option grant*	0.076	0.265	1											
[2]	*Stock price volatility*	1.117	1.217	0.033	1										
[3]	*Year*	2001	2	–0.035	–0.139	1									
[4]	*CEO power*	0.191	0.393	–0.001	0.018	–0.009	1								
[5]	*Size* (number of employees)	1.501	1.379	–0.036	0.221	0.010	0.046	1							
[6]	*Size* (log assets)	6.477	2.220	–0.044	0.284	0.096	0.050	0.797	1						
[7]	*Return on assets*	–0.056	0.273	–0.012	0.159	0.006	0.014	0.326	0.402	1					
[8]	*Named Big 6*	0.960	0.197	–0.016	0.096	–0.069	0.019	0.154	0.222	0.080	1				
[9]	*Backdating neighbors*	0.082	0.074	0.028	0.020	–0.090	–0.007	–0.076	–0.084	–0.051	–0.008	1			
[10]	*Backdating: auditor local office*	0.081	0.134	0.026	0.003	–0.049	–0.006	–0.058	–0.065	–0.025	–0.027	0.554	1		
[11]	*Backdating elsewhere in the U.S.*	0.081	0.010	0.035	0.139	–0.717	0.003	–0.018	–0.077	–0.094	0.078	0.131	0.079	1	
[12]	*Backdating: other offices of the same auditor*	0.080	0.014	0.033	0.071	–0.466	–0.004	–0.065	–0.123	–0.096	–0.206	0.098	0.106	0.683	1

Table 2

Results of Linear Probability Model Predicting Extremely Lucky Grants

					High uncertainty	Low uncertainty	Certainty
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stock price volatility	.00935***	.00925***	.00930***	.00926***	.00933***	.00616*	.0396
	(.00127)	(.00126)	(.00126)	(.00126)	(.00137)	(.00290)	(.0299)
CEO power	.000758	.000846	.000798	.000840	.00255	–.000046	–.00448
	(.00309)	(.00308)	(.00309)	(.00309)	(.00379)	(.00478)	(.00369)
Size	–.00545***	–.00533***	–.00534***	–.00530***	–.00611***	–.00388***	.000277
	(.000764)	(.000760)	(.000759)	(.000758)	(.000937)	(.00117)	(.000919)
Return on assets	.00330	.00383	.00336	.00367	.00633	.00781	.00885
	(.00520)	(.00519)	(.00518)	(.00518)	(.00618)	(.00912)	(.00639)
Audit firm reputation	–.0130^{+}	–.0131^{+}	–.0126^{+}	–.0128^{+}	–.0296**	.00276	.00218
	(.00710)	(.00707)	(.00702)	(.00703)	(.0109)	(.00830)	(.00503)
Time trend	–.00275***	–.00258***	–.00266***	–.00258***	.000176	–.000412	.00223*
	(.000481)	(.000480)	(.000479)	(.000480)	(.000931)	(.00178)	(.00113)
Backdating by proximate firms		.0691***		.0430^{+}	.0181	.0966*	.0323
		(.0197)		(.0223)	(.0251)	(.0376)	(.0289)
Backdating by proximate firms with the same auditor			.0391***	.0261*	.0428**	–.0306^{+}	.00109
			(.0104)	(.0117)	(.0143)	(.0176)	(.00115)
Constant	5.547***	5.203***	5.354***	5.204***	–0.300	0.846	–4.478*
	(0.964)	(0.961)	(0.958)	(0.960)	(1.860)	(3.569)	(2.259)
Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	56,745	56,745	56,745	56,745	38,353	18,369	28,552
R^2	0.007	0.007	0.007	0.007	0.008	0.006	0.004
No. firms	5,547	5,547	5,547	5,547	4,912	3,209	3,350

Note: Robust standard errors are reported in parentheses. FEs = fixed effects.
$^{+}p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Table 3

Results of Linear Probability Model Predicting Backdating from Backdating in Local Offices Not Auditing the Focal Firm

	Before SOX	After SOX
Variables	(5)	(6)
Stock price volatility	0.00931***	0.00641*
	(0.00137)	(0.00292)
CEO power	0.00258	–0.0005
	(0.00380)	(0.00478)
Size	–0.00610***	–0.00385**
	(0.000941)	(0.00117)
Return on assets	0.00631	0.00690
	(0.00620)	(0.00915)
Audit firm reputation	–0.0239*	0.00287
	(0.0111)	(0.00892)
Time trend	0.000137	–0.00653
	(0.00101)	(0.00438)
Backdating by proximate firms	0.0194	0.0986**
	(0.0252)	(0.0375)
Backdating by proximate firms with the same auditor	0.0418**	–0.0308^{+}
	(0.0144)	(0.0176)
Backdating elsewhere in the U.S.	–0.291	–0.827
	(0.466)	(0.560)
Backdating: Other offices of the same auditor	0.254	0.0181
	(0.166)	(0.243)
Constant	–0.223	13.15
	(1.999)	(8.805)
Industry	Yes	Yes
Observations	38,353	18,369
R^2	0.009	0.006

Note: Robust standard errors are reported in parentheses.
$^{+}p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Table 4

Changes in Backdating Behavior of Former Arthur Andersen Clients after 2002

Variables	*Backdating now*
Backdated prior	0.691**
	(0.280)
Former auditor high backdating	1.465**
	(0.584)
Current auditor high backdating	–0.510
	(0.634)
Exposure to other backdaters	2.446***
	(0.442)
Constant	–2.184***
	(0.190)
Observations	476

Note: Robust standard errors are reported in parentheses.
**$p < 0.05$, ***$p < 0.01$