THE IMPACT OF TRADE SECRETS LAW ON AUDITOR SHARING AMONG PEER COMPANIES

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ABSTRACT

This study examines the impact of U.S. states' staggered adoption of the inevitable disclosure doctrine (IDD) on rival companies' auditor choice. I posit that, in states where the IDD limits employee mobility among rival companies, the IDD adoption exogenously increases the costs of disclosing proprietary information through other channels. I find that on average peer companies do not show any changes in the probability of audit office sharing after the companies' headquarter states adopt the IDD. I also find that companies with trade secrets respond to IDD adoption by avoiding audits conducted by the same audit office as their competitors' audit office, supporting the proprietary cost hypothesis. The results are robust not only in various levels of auditor sharing but also after I incorporate factors including Mergers and Acquisitions, SOX, and differentiations of IDD adoption and rejection. Cross-sectional results related to Big N auditors suggest that peer companies with trade secrets that hire Big N auditors increase audit office sharing because Big N auditors' higher levels of reputation, higher litigation costs, and deep pockets alleviate concerns of potential information leakage through audit office sharing in the post IDD adoption periods. My cross-sectional results related to audit committee experts show that peer companies with trade secrets respond to IDD adoption by engaging in more frequent audit office sharing when they have industry experts and accounting financial experts on audit committees. Supervisory financial expertise on audit committees of peer companies with trade secrets does not seem to affect the probability of audit office sharing after the IDD adoption. To my knowledge, this study is the first to document the causal effect of proprietary information costs on audit office choices of U.S. companies with trade secrets.

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TABLE OF CONTENTS

Page

ABSTRACT.....ii

ACKNOWLEDGEMENT.....iii

LIST OF TABLES.....vi

CHAPTER

1. INTRODUCTION.....1

2. LITERATURE REVIEW AND BACKGROUND INFORMATION.....8

2.1 Auditor Sharing.....8

2.2 Trade Secrets, Trade Secrets Law, and the Inevitable Disclosure Doctrine.....10

2.3 The IDD Literature.....12

3. HYPOTHESES DEVELOPMENT.....15

3.1 The Impact of IDD Adoption on Peer Companies' Auditor Sharing.....15

4. RESEARCH METHODOLOGY.....18

4.1 Measure of the Costs of Information Disclosure.....18

4.2 Measure of Auditor Sharing.....18

4.3 Estimate the Impact of IDD Adoption on Auditor Sharing (H1) 19

4.4 Estimate the Impact of IDD Adoption on Peer Companies' Auditor Sharing Conditional on Companies' Ownership of Trade Secrets (H2) 21

5. DATA.....23

5.1 Sample Selection.....23

5.2 Descriptive Statistics.....25

5.3 Correlation Table.....26

6. MAIN EMPIRICAL RESULTS.....28

6.1 The IDD Adoption and Auditor Choice (H1) 28

6.2 The IDD Adoption and Auditor Choice Conditional on Company' Ownership of Trade Secrets (H2) 30

6.3 Robustness Checks of the Impact of IDD Adoption on Auditor Choice Conditional on Companies' Ownership of Trade Secrets.....33

6.3.1 The Impact of Auditor Mergers and Acquisitions.....33

6.3.1.1 Merger of PW and CL.....33

6.3.1.2 Exclusion of Arthur Andersen's Clients.....36

6.3.2 The Exclusion of Years Related to Sarbanes-Oxley Act.....38

6.3.3 The IDD Adoption and National-Level Auditor Sharing Outcomes.....40

6.3.4 The IDD Adoption and State-Level Auditor Sharing Outcomes.....44

6.3.5 The IDD Adoption and CBSA-Level Auditor Sharing Outcomes.....46

6.3.6 The IDD Adoption and Restricted Office-Level Auditor Sharing Outcomes....48

6.3.7 Differentiate IDD Adoption from IDD Rejection....50

7. CROSS-SECTIONAL EVIDENCE....54

7.1 Rival companies with Big N Auditors Versus Those with Non-big N Auditors....58

7.2 Rival companies with Audit Committee (AC) Specialists Versus Those without AC Specialists....58

7.2.1 Audit Committee Industry Expertise....60

7.2.2. Audit Committee Accounting Financial Expertise....64

7.2.3 Audit Committee Supervisory Financial Expertise....68

8. CONCLUSIONS....74

REFERENCES....76

APPENDICES....81

A. VARIABLE DEFINITIONS....81

B. PRECEDENT-SETTING LEGAL CASES ADOPTING OR REJECTING THE INEVITABLE DISCLOSURE DOCTRINE....83

LIST OF TABLES

Table Page

1. Sample Selection……23

2. Descriptive Statistics……..25

3. Correlations……27

4. Average Effects of IDD Adoption on Audit Office Sharing of Peer Companies……..29

5. Differential Effects of IDD Adoption on Audit Office Sharing of Peer Companies…….....31

6. The Impact of IDD Adoption on Auditor Sharing of Companies Excluding PW and CL Clients (1997 – 2017)……35

7. The Impact of IDD Adoption on Audit Office Sharing of Companies Excluding Arthur Andersen's Clients……37

8. The Impact of IDD Adoption on Audit Office Sharing of Companies Excluding SOX Years)……39

9. Differential Effects of IDD Adoption on Auditor Sharing of Companies Using Audit Analytics ……...……41

10. Differential Impact of IDD Adoption on State-Level Auditor Sharing……..……45

11. Differential Impact of IDD Adoption on CBSA-Level Audit Office Sharing…….....47

12. Differential Impact of IDD Adoption on Audit Office Sharing (Restricted Sample)……..49

13. The Impact of IDD Adoption and IDD Rejection on Audit Office Sharing……52

14. Company Pairs Both with Big N Auditors Versus Company Pairs That Do not Both Have Big N Auditors on Audit Office Sharing…..……..57

15. Company Pairs Both with Audit Committee Industry Expert Versus Company Pairs That Do not Have Audit Committee Industry Expert on Audit Office Sharing……....62

16. Company Pairs Both with Audit Committee Accounting Financial Experts Versus Company Pairs That Do Not Have Audit Committee Accounting Financial Experts on Audit Office Sharing……...66

17. Company Pairs Both with Audit Committee Supervisory Financial Experts Versus Company Pairs That Do Not Have Audit Committee Supervisory Financial Experts on Audit Office Sharing……...70

CHAPTER 1
INTRODUCTION

Many factors, such as pricing, expertise, and location, affect a client's process of choosing an audit firm (Johnson and Lys 1990; Chaney, Jeter, and Shaw 1997). For example, clients with similar audit needs and preferences might choose the same audit firm. This practice is known as auditor sharing. Although clients can benefit from auditor sharing because of the auditor's specialized knowledge and industry expertise (Bell, Causholli, and Knechel 2015), they are reluctant to share auditors when the cost of information is higher, such as in more competitive industries (Kwon 1996; Bills, Cobabe, Pittman, and Stein 2020). The information leakage can damage clients' competitive advantage over their rival companies (Li, Lin, and Zhang 2018).

Several theoretical studies have posited that one negative externality of sharing a service provider might be information leakage (e.g., Demski, Lewis, Yao, and Yildirim 1999; Hughes and Kao 2001; Dye and Sridhar 2003; Baccara 2007). These models suggest that clients may suffer information leakage from sharing a supplier with competitors. Similarly, when deciding whether to share auditors, companies must weigh the benefits of specialized auditor knowledge obtained from other comparable clients over the risks of information predation from rival companies (Kwon 1996).

Clients' concerns about information leakage through auditor sharing remains largely unexplored in the empirical literature. Only two studies have examined the potentially negative ramifications of information leakage from auditor sharing (Aobdia 2015; Bills, Cobabe, Pittman, and Stein 2020). Anecdotal evidence suggests that the negative externalities from auditor sharing deserve more scholarly attention. For instance, when Coca-Cola and PepsiCo's respective

auditors merged, the newly formed Ernst & Young parted ways with PepsiCo (Berton and Niebuhr 1990; Cowan 1990), reputedly under pressure from Coca-Cola. Recent survey data from experienced audit partners reflect this concern as well, with most partners recalling instances when a current or prospective client expressed concern about information leakage to a competitor in the auditor selection decision process (Bills et al. 2020).

One of the challenges of analyzing companies' concerns about information leakage from auditor sharing is that such concerns are not directly measurable. Aobdia (2015) approaches the problem by finding several exogenous shocks that vary the costs associated with proprietary information disclosure. These shocks include three mergers of large audit firms in the 1980s and 1990s, an increase in competition intensity within industries identified by import tariff reductions from 1989 to 2005, and a decrease in the enforcement level of noncompete agreements in Texas in 1994. Although Aobdia (2015) provides some evidence on the concern of information leakage, his results may not be generalizable to all U.S. companies because these shocks are infrequent and often restricted to a limited number of auditors, industries, states, and years.

Bills et al. (2020) find that companies are more likely to share the same auditor when their product offerings become more similar. However, they also find that the likelihood of companies with similar products sharing the same auditor decreases when the costs of information leakage are high. They use three market-related proxies for the costs of information leakage: industry competitiveness, market leadership, and relative R&D expenditures. However, it is difficult for proxies to account for the causality of the costs of information leakage from auditor sharing.

Like Aobdia (2015), my research setting generates plausible exogenous variations in a company's proprietary costs of information disclosure, i.e., the staggered adoption of the

Inevitable Disclosure Doctrine (IDD) by U.S. state courts. The IDD is a legal doctrine through which an employer (the plaintiff) can acquire an injunction to deprive its current or former employee (the defendant) of the right to work for another company because this employee would "inevitably disclose" the company's trade secrets in his/her future employment (Li et al. 2018; Kim, Su, Wang, and Wu 2020). "Trade secrets are information that derive future economic value from not being appropriable by competitors (e.g., unpatented innovations)" (Glaeser 2018, page 163).

Specifically, I exploit differences in the timing of the state courts' IDD adoption and the effects of the adoption on companies' auditor choice. I argue that IDD adoption exogenously increases the proprietary costs of information disclosure because it reduces the information flow due to employees' job switch, a major channel of information transmission. When the IDD is adopted in a company's headquarter state, the company tends to experience less information leakage because fewer employees move to rival companies, thereby protecting trade secrets. With less access to trade secrets through employee predation, rival companies would rely more heavily on alternative channels, such as auditor sharing, to obtain proprietary information. Consequently, it is possible that a company with trade secrets would be less willing to share an auditor with rival companies to prevent leakage of proprietary information following IDD adoption of the company's headquarter state.

This study uses a difference-in-difference (DID) specification with a panel of 226,600 paired observations of U.S. industry peers from 2000 to 2017. On average, I find that peer companies do not change their auditor sharing preference after their headquarter state adopts the IDD. I also find that, after a state adopts the IDD, peer companies with trade secrets become less likely to engage in auditor sharing. In the regression models, I control for time-varying

companies- and industry-level factors that impact the level of auditor sharing among peer companies. I also incorporate state and year fixed effects to control for time-invariant and unobservable state and year characteristics.

The results remain robust to auditor sharing at various levels including national-, state-, and core based statistical area levels.[1] I find that peer companies with trade secrets become less likely to share the same auditors, the state of audit offices, and the core based statistical areas of audit offices in the post IDD periods. The results remain robust after I exclude complex effects from auditors' mergers and acquisitions and the Sarbanes-Oxley Act of 2002. I also get consistent results when I differentiate IDD adoption from IDD rejection.

I conduct two cross-sectional analyses in addition to my main analyses. The first cross-sectional analysis is related to whether paired companies' auditors are Big N auditors. I find that peer-company pairings that use Big N auditors become more likely to engage in auditor sharing following IDD adoption if both companies have trade secrets. The results suggest that peer companies with trade secrets and who engage Big N auditors are more willing to share the same audit office following IDD adoption when the costs of information leakage increase. Therefore, companies with trade secrets and who contract with Big N auditors are more likely to engage in auditor sharing following IDD adoption because peer clients consider Big N auditors more reputable. Compared with sharing non-Big N audit offices, sharing Big N audit offices would lower the probability that their proprietary information would be intentionally or accidentally leaked to competitors. This may be because large auditors could suffer a greater loss of rents from behaving opportunistically (DeAngelo 1981). They endure higher litigation risks and have

[1] In the US, Core-Based Statistical Areas (CBSA) refer to Metropolitan and Micropolitan Statistical Areas. "New metropolitan and micropolitan statistical area definitions were announced by Office of Management and Budget on June 6, 2003, based on application of the 2000 standards with Census 2000 data" (https://www.census.gov/topics/housing/housing-patterns/about/core-based-statistical-areas.html).

deeper pockets than smaller audit firms due to several and joint liability (Lennox 1999). Big N auditors "who not only have deep pockets, but cannot abscond, may be hit for the entire bill if they were negligent, even if other parties were careless too" (Lennox 1999, p. 217). Therefore, companies feel more confident in protecting their proprietary information against competitors by choosing to share Big N auditors, while appreciating the knowledge and specialization accumulated from serving a large client base. This way, companies reduce their concerns about the information misappropriation following IDD adoption when costs of information leakage elevate.

The second cross-sectional analysis is related to whether paired companies' auditors have certain experts on their audit committees. I find that peer companies with trade secrets are more likely to share auditors when they have Industry Experts or Accounting Financial Experts on their audit committees. In contrast, peer companies with trade secrets and with Supervisory Financial Experts do not show a significant change in their preference over auditor sharing after the companies' headquarter states adopt the IDD. The results suggest that after the companies' headquarter states adopt the IDD, peer companies that have industry experts on the audit committees (AC) are more willing to share audit offices because the AC industry experts would have more industry-related expertise about many estimates that reflect the complexities of a company's industry. AC industry experts are more likely to help the AC better understand and evaluate industry-specific estimates and provide them to the auditors without sacrificing the company's cutting-edge proprietary information in the industry.

In addition, the results also suggest that after the companies' headquarter states adopt the IDD, peer companies that have accounting financial experts on the ACs are also more likely to share the audit offices. AFEs on the ACs may better understand the audit process, risks, and

auditing procedures than members without expertise. They are expected to demand a higher level of assurance by providing the most relevant information to auditors and avoiding unnecessary proprietary information loss to shared auditors, while clients can still benefit from shared auditors who have experience from serving clients in similar industries. Consequently, companies with trade secrets are more likely to share the same audit office with the peer companies after the IDD when they have AFE(s) on the ACs.

This study makes a few contributions to the literature. First, I take a unique and causal look at the IDD's impacts on auditor sharing. Whereas previous studies have focused on the benefits of auditor sharing, my analysis notes an effect of the IDD in heightening companies' concern about information leakage. Moreover, through this analysis, I show that because state courts' staggered adoption of the IDD has previously been an exogenous shock on employee mobility (Klasa, Ortiz-Molina, Serfling, and Srinivasan 2018), it raises the costs of proprietary information disclosure through auditor sharing.

Second, this study advances the literature by providing more generalizable evidence to support managers' concern about information leakage in auditor sharing and confirming findings of prior literature using a different research design as previous studies focuses on a relatively smaller sample of companies in certain industries or years (i.e., Aobdia 2015; Bills et al. 2020). My study uses a different setting, state courts' staggered adoption of the IDD, and my sample covers a range of industries, company sizes, and years. This setting provides much wider, stronger, and far-reaching protections of trade secrets than noncompete agreement (Li et al. 2018; Kim et al. 2020). For instance, Aobdia (2015) uses a change in noncompete enforcement rules in Texas in 1994, adding confidence to extant findings from a more representative sample.

Third, I examine the differential impacts of IDD adoption on the auditor-sharing propensity of companies with varying degrees of trade secrets (using a measure developed by Glaeser 2018), providing cross-sectional evidence that IDD adoption primarily benefits companies with trade secrets.

The remainder of this paper proceeds as follows. Chapter 2 reviews previous literature related to auditor sharing, trade secrets, and the Inevitable Disclosure of Doctrine. Chapter 3 discusses my hypotheses development. Chapter 4 articulates my research design and variable measurements. Chapter 5 describes the data, sample selections, and summary statistics. Chapter 6 presents my main empirical results and robustness check. Chapter 7 discusses my two cross-sectional analyses. Finally, my conclusions are presented in Chapter 8.

CHAPTER 2

LITERATURE REVIEW AND BACKGROUND INFORMATION

2.1 Auditor Sharing

Companies hire independent auditors to perform a quality audit of their financial statements. When a company hires an industry specialist auditor, it often shares the auditor with its peer companies because that auditor may specialize in a particular field. Specialist auditors have invested significantly to gain auditing expertise in their industries and are rewarded with a larger market share of the auditing service. Auditors' knowledge and competencies play important roles in their audit performance of clients such as general domain knowledge, business knowledge, and subspecialty knowledge (PCAOB AS 1010; Bonner and Lewis 1990). Consequently, companies gain higher audit quality in the form of lower discretionary accruals, fewer accounting errors and improved accounting transparency through auditor sharing (Owhoso, Messier, and Lynch 2002; Krishnan 2003; Dunn and Mayhew 2004; Reichelt and Wang 2010; Bell, Causholli, and Knechel 2015). Companies are also rewarded with higher earnings response coefficients (Balsam, Krishnan, and Yang 2003; Gul, Fung, and Jaggi 2009) and access to other value-added information (Bae et al. 2017).

However, auditor sharing also involves risks. Companies run the risk of information leakage when they share an auditor with peer companies since auditors could access and transfer clients' proprietary information through informal or institutionalized channels. Anecdotal evidence shows that clients are concerned that auditors would leak information from one client to another, especially among competing companies. For instance, when Ernst & Whinney, Coca-Cola's auditor, merged with Arthur Young, PepsiCo's auditor in 1990, the combined firm of Ernst & Young was requested to withdraw as auditor of PepsiCo due to concerns raised by Coca-

Cola (Berton and Niebuhr 1990). Since then KPMG has served as PepsiCo's auditor. Chrysler treasurer Frederick Zuckerman raised similar concerns about information leakage and auditor mergers: "It'd be very awkward to have the same auditor for two large companies…. Clients may feel uncomfortable knowing that their corporate secrets are lying just a few files away from papers of their archrivals" (Tierney 1989).

Some empirical studies suggest that value-relevant information is advertently or inadvertently transferred among peer companies by auditors. For instance, Aobdia (2015) finds that peer companies headquartered in Texas were more likely to share auditors after the Texas Supreme Court significantly lowered the enforcement of noncompete agreements in the state in 1994. Dhaliwal, Lamoreaux, Litov, and Neyland (2016) document evidence of information leakage in M&A deals when the bidder and target companies share the same audit office, resulting in lower deal premiums, lower target event returns, higher bidder event returns, and higher deal completion rates. Similarly, Cai, Kim, Park, and White (2016) find that deals with shared auditors have higher acquisition announcement returns than those with different auditors. This effect is more pronounced for deals involving acquirers and targets that shared the same auditor.

Therefore, clients need to weigh the benefits from industry specialization and risks of information leakage from shared auditors with rival companies. If the benefits of industry specialization outweigh the potential cost, companies will choose to share auditors. Otherwise, they would avoid the same auditors as their competitors.

2.2 Trade Secrets, Trade Secrets Law, and the Inevitable Disclosure Doctrine

Trade secrets are proprietary information possessed by companies with commercial values and are kept confidential to gain competitive advantage over competitors. According to the Restatement (Third) of Unfair Competition §39 (1995), trade secrets are defined broadly to include "any information that can be used in the operation of a business or other enterprise and that is sufficiently valuable and secret to afford an actual or potential economic advantage over others" (Li et al. 2018).[2] Examples of trade secrets include business plans, customer lists, methods of production, and business processes. Compared to patents, trademarks, and copyrights, trade secrets have unlimited duration. Although trade secrets are also protected against disclosure, the law does not protect trade secrets uncovered by accident, developed independently, or through reverse engineering (Lemley 2008).

Nowadays data is increasingly stored electronically, and employees continue to be highly mobile. Therefore, loss of proprietary information and trade secret from current or former employees is a growing risk for companies. Furthermore, when trade secrets are misappropriated, they could be lost permanently. It is estimated that "seventy percent of the value of publicly traded companies is intellectual property in the form of patents, copyrights, trade secrets, and other information."[3] Notably, most departing employees admit to taking company data before leaving their employers. Companies' inability to protect trade secrets from rival companies expose them to the potential loss of competitive advantages in the industry.

[2] In comparison, under the Uniform Trade Secret Act, a trade secret is defined to be "information, a formula, program, method, technique, or process. It can be used to produce independent economic value (actual or potential) due to the fact that it is not known publicly" (https://www.rocketlawyer.com/article/uniform-trade-secrets-act-ps.rl). It provides a company with an edge over the competition that rival companies don't know about, and that the company is keeping confidential. The United States has the most advanced legal system that protects trade secrets.

[3] Your Employees are Taking Your Data (https://www.infosecurity-magazine.com/opinions/employees-taking-data/)

In the United States, the protections of trade secrets are mainly overseen by state- rather than federal jurisdiction in the civil area (Pooley 1997). Historically, trade secrets are protected under common law. According to common law principles, a company can only take legal actions against trade secret misappropriation when its secret is seized by improper means, such as fraud and conspiracy (Chapman 1986). In 1979, the Uniform Trade Secrets Act (UTSA) was published to provide states with a uniform legal framework of trade secrets protection. For instance, it helps a company prevent trade secrets from being misappropriated by requesting a preliminary injunction.

The IDD adoption by state courts reduces employee mobility to peer companies and enhances the company's ability to guard its trade secrets (Klasa et al. 2018). The IDD does not require employers to provide proof of actual or even threatened loss or misappropriation of trade secrets by its employee. Therefore, the IDD applies to each employee no matter whether s/he signed a noncompete or nondisclosure agreement with her/his employer. It also applies to any business secrets. In this case, the state court's adoption of the IDD blocks information leakage to peer companies through employees' job switching in the state.

The PepsiCo, Inc. v. Redmond case in 1995 signifies the widespread attention of the IDD. PepsiCo won a preliminary injunction to prohibit its senior manager Redmond from working for its competitor Quaker Oats Co. No actual misappropriation of trade secrets had taken place, but the plaintiff PepsiCo succeeded in stopping the mere threat of trade secrets' leakage if its senior manager worked for Quaker Oats Company (Li et al. 2018; Li and Li 2020).

2.3 The IDD Literature

Png and Samila (2015) investigate the effects of the IDD in state-level trade secrets law on professional mobility. They find that state court rulings supporting the IDD are associated with workers' lower job switch. These results are stronger in states with lower enforcement levels of noncompete covenants. The impact of trade secret law, specifically the IDD, on worker mobility indicates that knowledge of an implicit nature relies more on employee movement. Knowledge diffusion is slower when employees reduce job switching to other companies as they are more aware of the law regarding inevitable disclosure. Consequently, companies face less competitive threats from the potential loss of trade secrets to other rival companies than those not impacted by IDD adoption (Klasa et al. 2018).

Accounting researchers study how companies respond to the staggered adoption of the IDD. One stream of accounting research focuses on the impact of IDD adoption on certain corporate disclosure. Information disclosure reduces information asymmetry between managers and outside investors. The adoption of the IDD reduces the proprietary information flow to peer companies through employee movement. Therefore, companies respond to the IDD by reducing their disclosure about customer identities after their headquarter states adopt the IDD (Li et al. 2018). Similarly, Kim, Su, Wang, and Wu (2020) document that companies reduce the amount of proprietary information disclosure in the 10-K reports after their headquarter states adopt the IDD. They also document higher stock price synchronicity as a result of reducing company-specific information incorporated in stock prices.

Li and Li (2020) argue that competitors need both trade secrets and forward-looking financial information to acquire a competitive advantage. Thus, peer companies would not benefit from only knowing the company's forecast number if they do not have any of their

competitors' proprietary information. In this case, a higher level of trade secrets protection appears following IDD adoption. The authors find evidence that managers feel more comfortable issuing more frequent earnings forecasts as doing so will no longer negatively impact the company.

Other studies examine the effect of IDD adoption on company's performance and cost structure. For instance, Klasa et al. (2018) find that companies whose headquarter states adopt the IDD choose a less conservative capital structure, reflected by an increase in leverage, than their unaffected rivals. Gao, Wang, and Yin (2020) find that IDD adoption is associated with a reduction in cost elasticity in companies whose headquarter states adopt the IDD. In addition, Qiu and Wang (2018) conduct an event study using the staggered adoption and rejection of the IDD. They find companies have positive abnormal stock returns around the days when the IDD is adopted in their headquarter states. They also unveil a positive IDD treatment effect in the company's investment in knowledge assets. Overall, accounting studies related to the IDD have not examined the impact on the choice of auditors.

The crucial assumption behind the identification strategy is that companies know the precedent-setting legal cases are adopting or rejecting the IDD. This assumption is probably valid for the following reasons. First, company managers are expected to pay close attention to trade secret laws because trade secrets are valuable assets critical to gain a competitive advantage over their competitors (Li et al. 2018). Second, precedent-setting cases, such as PepsiCo v. Redmond (7th Cir, 1995) and Procter & Gamble Co. v. Stoneham (Ohio Ct. App. 2000), received widespread attention from the media. Meanwhile, almost all public companies have in-house general counsels, which play an important oversight role within companies in compliance with laws and regulations as well as companies' financial reporting (Hopkins, Maydew, and

Venkatachalam 2015). Media coverage of these legal cases is likely to lead companies to closely monitor their headquarter-states rulings that affect trade secret protection (Li et al. 2018). Therefore, managers are likely to know, understand, and evaluate the potential impact of the IDD on their companies.

The law of a state where a company is headquartered (hereafter, their headquarter state) is generally applicable in trade-secret related suits even though a company headquartered in one state is possibly subject to common laws from other states (Li et al. 2018). Courts often rule in favor of the state that companies have significant relationship with, which in most cases is the companies' home state (Ingle 2013; Jones 2014). In addition, when contractual disputes take place, the *lex loci contractus*[4] (the Latin term for "law of the place where the contract is made") is applied (Li et al., 2018).

[4] This principle is applicable when there arises a conflict of laws regarding a contract and when the validity of a contract is in question.

CHAPTER 3
HYPOTHESES DEVELOPMENT

3.1 The Impact of IDD Adoption on Auditor Sharing

I examine the impact of IDD adoption on auditor sharing due to managers' concerns about information leakage to peer companies for the following reasons. First, auditors have access to a wide variety of the clients' proprietary information when they perform the audit and obtain reasonable assurance over whether the clients' financial statements are free of material misstatement. As I discussed in Section 2.1, both anecdotal evidence and empirical findings indicate that companies are concerned when sharing an auditor with a rival because of informal or institutionalized information transfer channels by an auditor.

Second, the number of auditors who are capable of auditing large publicly traded companies is limited. If clients further require that an auditor have specific industry expertise, they have a small pool of auditors from which to choose. Moreover, following the provisions of the Sarbanes-Oxley Act of 2002, the SEC prohibited auditors from providing certain non-audit services that impair audit independence, such as bookkeeping, design and implementation of financial information systems design, appraisal and valuation services, and actuarial service. Consequently, companies cannot hire auditors to perform external audit if they receive such non-audit services that impair audit independence. As a result, companies have a smaller number of audit firms to choose from (Brown and Knechel 2016). Therefore, managers of client companies choose auditors after balancing the benefits from getting auditing service from an industry specialist and costs of potential proprietary information leakage due to sharing an auditor with a rival company.

I exploit the staggered adoption of the IDD among US states and examine the impact of the IDD adoption on companies' propensity for auditor sharing. I use audit office sharing for my dependent variable, i.e., two rivals share the same audit office. I choose audit office sharing for the following reasons. The staggered adoption of the IDD is at state levels. If a state adopts the IDD, both companies whose headquarters are in the state would expect lower employee mobility. Auditors from the same audit offices are more likely to talk to each other than auditors from different audit offices as they are more likely to meet their colleagues in the same audit offices frequently. Managers are thus more likely to be concerned about proprietary information leakage through audit office sharing than national-level auditor sharing.

Klasa et al. (2018) summarize precedent-setting legal cases adopting or rejecting the Inevitable Disclosure Doctrine in US states (reproduced in Appendix B). As stated in Klasa et al. (2018) and Li et al. (2018), IDD adoption is an exogenous shock to the marginal costs of information disclosure. The adoption of the IDD by US state courts exogenously increase the protection of trade secrets by preventing employees who hold proprietary information from working for rival companies. When a state adopts the IDD, employee mobility among rival companies headquartered in the state would decrease. Consequently, less proprietary information would be transferred among competing companies through employees' job switching.

A company could learn about its rival's trade secrets by acquiring talented employees from its competitor; alternatively, it could obtain rivals' trade secrets through alternative channels such as auditor sharing. Companies with proprietary information are more concerned about trade secrets leakage in general. When the IDD adoption restricts employee mobility and makes it less likely for information to leak through this channel, they may be wary of rival companies relying more heavily on the alternative channel of information transfer, i.e., through

auditor sharing. This "substitution" effect increases the company's cost of public disclosure through auditor sharing because rival companies will find it more valuable (Li et al. 2018). Companies that have proprietary information to protect would be less likely to share auditors with rivals following IDD adoption.

If rival companies plan to obtain others' proprietary information and find it more difficult to do so by acquiring talent following IDD adoption, they could have more incentive to share an auditor with rivals. Such a strategy is unlikely to be successful because a company with trade secrets to protect can switch auditors. The IDD adoption is unlikely to change the incentives for a company without trade secrets if it does not intend to steal rival companies' information.

Due to the differential prediction depending on whether a company has proprietary information to protect and wants to obtain rivals' information, I do not make a directional prediction over the average effect of the IDD on the audit office sharing among rival companies. Therefore, my first hypothesis is stated in null form below.

H1. *Ceteris paribus, there is no change in the incentives to share an audit office among rival companies when the costs of information leakage increase.*

Despite the lack of prediction on the average effect, I predict that companies with proprietary information are less likely to share audit office after their headquarter states adopt the IDD because the channel of information leakage through employee movement is restrained. My second hypothesis is stated in alternative form below.

H2. *Ceteris paribus, rival companies with proprietary information become less likely to share an audit office when the costs of information leakage increase.*

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Measure of the Costs of Information Disclosure

I use a plausibly exogenous shock to proprietary costs of information disclosure, the adoption of the IDD, to measure the change of proprietary costs of information disclosure. The IDD arguably provides much stronger protection related to trade secrets than noncompete agreements (Li, Lin, and Zhang 2018), which restricts employee mobility (Png and Samila 2015; Klasa et al. 2018). This in turn increases the probability of information leakage through shared auditors. My variable of interest, *Post,* is coded 1 if the observation is in the year after the state adopts the IDD, and 0 otherwise.[5]

4.2 Measure of Auditor Sharing

Because the adoption of the IDD is directly related to the headquarter states, I examine whether the likelihood that two rival companies share the same audit office changes after their home state adopts the IDD. The auditor sharing variable, *Audit Office Sharing*, is coded 1 if the focal company *i* and peer company *j*, from the same industry and headquartered in the same state, share the same audit office, and 0 otherwise. In the analysis, pairs of same-industry companies are restricted to companies whose headquarters are in the same state because employee relocation is stronger within smaller geographic areas (Breschi and Lissoni 2009).

[5] Appendix B, reproduced from Li et al. (2018) and Klasa et al. (2018), lists all the precedent-setting cases for the period 1919–2011.

4.3 Estimate the Impact of IDD Adoption on Audit Office Sharing (H1)

I use a difference-in-difference regression to examine how the IDD adoption by state courts impacts the propensity of audit office sharing among rival companies. To analyze the first hypothesis (H1), I examine the impact of the adoption of the IDD on the propensity for two rival companies headquartered in the same state to share the same audit office. Specifically, I estimate a pairwise regression for each company-peer-year combination to test the likelihood of the two rival companies sharing the same audit office. I regress my dependent variable on the independent variable of interest, *Post*, and a set of control variables in the logistic regression model below (model 1), following Aobdia (2015), to test H1.

$$Audit\ Office\ Sharing_{i,j,t} = \alpha + \beta_1\, Post\ + \beta_2\, \Delta Sale + \beta_3\, IndSale + \beta_4\, Herfindahl + \beta_5\, Margin + \beta_6\, Capex + \beta_7\, Age + Year\ fe + State\ fe + \epsilon \quad (1)$$

Companies i and j are a pair of rival companies in the same industry and headquartered in the same state. *Post* is the IDD indicator variable and is coded 1 if both companies are headquartered in the state that adopts the IDD, and 0 otherwise. I code *Post* to be 1 in all years after the state where the pairing companies are headquartered adopts the IDD and 0 in all years before the companies' headquarter state adopts the IDD. A company's audit committee generally pre-approves an auditor's appointment in the proxy statement. Shareholders ratify audit committee's decision in the annual meeting soon after the company's fiscal year has ended. Therefore, I set *Post* to be 0 in the year when the pairing companies' home state adopts the IDD.

The coefficient β_1 measures the change in audit office sharing among pairs of rival companies headquartered in a state following IDD adoption. Since the effects of the IDD adoption on the audit office sharing of rival companies counteract, I do not have a predictive sign for β_1.

I follow Aobdia (2015) and include control variables in my models. First, Aobdia (2015) suggests that the greater the size difference between two companies, the lower the probability that companies share auditors. Δ*Sale* is a measure of the size difference between the two companies in the pair. This measure is equal to the absolute value of the revenue difference between two companies divided by the sum of their revenues. Second, he suggests that companies in more concentrated industries are less likely to share auditors. *Herfindahl* is a measure of company size in relation to the industry. It measures market concentration. Third, he suggests that companies in industries with high barriers to imitations are less likely to share auditors because high capital expenditures possibly reduce costs of information leakage. *Capex* is the logarithm of the weighted average capital expenditures in the industry, weighted by each company's market shares defined by sales. I also include *IndSale*, *Margin*, *and Age* as my control variables. *IndSale* is the logarithm of the six-digit NAICS code industry sales. *Margin* equals the industry aggregate sales divided by industry aggregate operating costs. It measures industry differentiation. *Age* is the average age of companies within a given industry with age calculated from the first day the company becomes available in Compustat.

4.4 Estimate the Impact of IDD on Peer Companies' Audit Office Sharing Conditional on Companies' Ownership of Trade Secrets (H2)

My second hypothesis (H2) tests whether a company with trade secrets is less likely to share an audit office with its rivals when the costs of information leakage elevate. I investigate the effect of the IDD adoption in the home state of two rival companies on the propensity for the two rivals to share the same audit office. Specifically, I use the following model to estimate a pairwise regression for each company-peer-year combination and test the probability of sharing the same audit office between two rival companies with trade secrets.

$$
\begin{aligned}
&Audit\ Office\ Sharing_{i,j,t} \\
&\quad = \alpha + \beta_1\, Post\ + \beta_2\, Tradesecret1\ + \beta_3\, Post * Tradesecret1 \\
&\quad + \beta_4\, Tradesecret2 + \beta_5\, Post * Tradesecret2\ + \beta_6\, \Delta Sale + \beta_7\, IndSale \\
&\quad + \beta_8\, Herfindahl + \beta_9\, Margin + \beta_{10}\, Capex + \beta_{11}\, Age + Year\ fe \\
&\quad + State\ fe + \epsilon.
\end{aligned}
\tag{2}
$$

In model (2), the dependent variable, *Audit Office Sharing*, is the same as that of model (1). I include the IDD indicator variable *Post* to identify whether the periods are after the adoption of the IDD. I use indicator variables, *Tradesecret1* and *Tradesecret2*, to identify how many matched rival companies have trade secrets. *Tradesecret1* is coded1 if only one of the two matching rival companies has trade secrets, and 0 otherwise. *Tradesecret2* is coded 1 if both matching rival firms have trade secrets, and 0 otherwise.

The coefficient β_3 measures the change in audit office sharing among rival companies with only one trade secret and headquartered in a state following IDD adoption. The coefficient β_5 measures the change in audit office sharing among pairs of rival companies that both have trade secrets and are headquartered in a state following IDD adoption. Because the IDD adoption

on the audit office sharing of rival companies with trade secrets increases costs of information leakage, I expect negatives signs for β_3 and β_5. I use the same control variables as in model (1).

CHAPTER 5

DATA

5.1 Sample Selection

I start with firm-year observations in Compustat from 2000 to 2017 that are incorporated in the United States. Table 1 below summarizes my sample selection process.

Table 1.

Sample Selection

Observations from Compustat data (2000 – 2017)	170,969
Less: observations with missing NAICS and observations in financial sectors (SIC codes 6000 – 6999)	75,130
Less: observations missing Audit Analytics data (audit opinion and audit fee data)	16,739
Less: observations lost/duplicate when merging with Dr. McDonald's historic headquarter data	8,430
Remaining Observations	70,670
Merge with Trade Secret Data from Dr. Glaeser	70,670
Remaining Observations (company-year observations)	70,670
Match companies with their rival companies (company-peer-year observations)	543,146
Less: observations that are entirely duplicate pairs	271,573
Less: observations that have missing control variables in the analysis	44,973
Final Sample for the Main Analysis related to Trade Secret (Company-peer-year observations)	**226,600**

My sample begins in 2000 because audit-related data has only been available in Audit Analytics since that year. My sample ends in 2017 when trade secrecy data from Dr. Glaeser ended. I delete observations from the financial industry (SIC code from 6000 to 6999) or missing

NAICS. I merge the remaining data with audit opinion and audit fee data from Audit Analytics to get audit-related data.

I then merge my sample with Dr. Bill McDonald's historic headquarter data.[6] This results in a loss of 8,430 observations. The database constructed by Dr. McDonald provides information about companies' historical locations from 1995 to 2018. My key identification strategy related to the IDD requires accurate determination of the company's historical locations. I use companies' historic headquarters state rather than their most recent headquarters state from Compustat Annual Database because companies sometimes change their headquarters. For instance, Klasa et al. (2018) find that about 9.3 percent of companies in Compustat moved headquarters from one state to another. Large measurement errors would occur in my IDD variable if I used companies' most recent headquarter states to determine the IDD adoption years of companies. Therefore, the final sample contains 70,670 company-year observations.

Next, I pair each company with its rival peers from the above company-year observations. I define peer companies as two companies in the same NAICS-defined industry group that share the same home state. For example, when Company A has eight peers, those peers are companies in the same industry group as Company A and that share the same home state with Company A. In this case, my sample would include eight company-peer-year pairs (Pair A-B, Pair A-C, Pair A-D, Pair A-E, Pair A-F, Pair A-G, Pair A-H, and Pair A-I). I get 504,530 rival-company pairings. Next, I exclude duplicate company-peer-year pairings in my sample by removing the bigger company pairing in each duplicate company-peer-year pair (i.e., Pair B-A, Pair C-A, Pair D-A, Pair E-A, Pair F-A, Pair G-A, Pair H-A, and Pair I-A). I get 271,573 non-duplicate pairings.

[6] I downloaded the data from the following link: https://sraf.nd.edu/data/augmented-10-x-header-data/

Finally, I remove 44,973 rival-company pairings that have missing data for one or more control variables. This procedure results in a full sample of 226,600 company-peer-year observations in the final pairwise sample. Several later tests have smaller samples because they require data for additional test variables.

5.2 Descriptive Statistics

Table 2 reports descriptive statistics for the variables used in the study.

Table 2.

Descriptive Statistics

Variable	Mean	Std. Dev.	Q1	Median	Q3
Audit Office Sharing	0.095	0.293	0	0	0
Post	0.196	0.397	0	0	0
Tradesecret1	0.195	0.396	0	0	0
Tradesecret2	0.630	0.483	0	1	1
Δ*Sale*	0.719	0.304	0.502	0.842	0.987
IndSale	11.440	0.947	11.080	11.600	12.080
Herfindahl	0.146	0.085	0.091	0.132	0.180
Margin	1.202	0.171	1.120	1.225	1.308
Capex	6.786	1.247	5.905	6.792	7.634
Age	12.540	4.226	9.017	12.510	14.140

The mean value of *Audit Office Sharing* is 9.5%. In other words, the propensity for an average pair of industry rivals to share the same audit office is nine percent. The mean value of

Post is 0.196, suggesting that 19.6 percent of company-year pairs headquarters are in the states that adopt the IDD.

The means of the trade secret variables, *TradeSecret1* and *TradeSecret2*, are 0.195 and 0.630, respectively. This suggests that 19.5 percent of rival company pairs have only one of the companies owning trade secrets in pairs and that 63 percent of company-peer pairs both have trade secrets. This also implies that 17.5 percent of company pairs do not own any trade secret in my sample.

The means of Δ*Sale*, *IndSale*, and *Herfindahl* in the company-peer sample are 0.719, 11.440, and 0.146, respectively. They are similar to the means reported in Table 5 Panel A of Aobdia (2015).[7] The means of *Margin*, *Capex*, and *Age* in the company-peer sample are 1.202, 6.786, and 12.540.

5.3 Correlation Table

Table 3 provides correlations among the variables used in the study.

[7] Admittedly, Table 5, Panel A, of Aobdia (2015) provides descriptive statistics of auditor choice around the change in enforcement of noncompete agreements in Texas. It only has two year of observations, 1993 and 1995, one year apart from the time of a change in the enforcement of noncompete agreements for the state of Texas in 1994.

Table 3.

Correlations

Variables	*Audit Office sharing*	*Post*	*Tradesecret1*	*Tradesecret2*	Δ*Sale*	*IndSale*	*Herfindahl*	*Margin*	*Capex*	*Age*
Audit Office Sharing	1.00									
Post	0.06***	1.00								
Tradesecret1	-0.02***	0.02***	1.00							
Tradesecret2	0.04***	0.02***	-0.64***	1.00						
Δ*Sale*	-0.10***	0.03***	0.03***	-0.05***	1.00					
Sale	-0.03***	-0.10***	-0.04***	-0.05***	0.06***	1.00				
Herfindahl	0.00**	0.09***	0.00*	0.22***	0.01***	-0.34***	1.00			
Margin	-0.01***	0.06***	-0.11***	0.10***	0.10***	0.29***	0.08***	1.00		
Capex	-0.02***	-0.17***	0.01***	-0.26***	0.07***	0.79***	-0.23***	0.18***	1.00	
Age	0.01***	-0.02***	0.07***	-0.28***	-0.08***	0.05***	0.07***	-0.11***	0.19***	1.00

**** p<0.01, ** p<0.05, * p<0.1*

I observe a highly statistically significant and positive correlation, 0.06, between *Audit Office Sharing* and *Post*. The correlations between *Post* and the other independent variables do not exceed +/- 0.35, indicating that multicollinearity is not a concern.

CHAPTER 6
MAIN EMPIRICAL RESULTS

6.1 The IDD Adoption and Auditor Choice (H1)

Table 4 provides the results of testing H1 by estimating model (1). I include both state and year fixed effects. Columns (1) and (2) present the results of logistic regressions using pair level clustered standard errors. In column (1), *Post* is the only independent variable included in the regression. In column (2), control variables are included in the regression. Columns (3) and (4) present the results of linear probability models (LPM) using pair level clustered standard errors. Variables are defined in Appendix A.

Table 4 (H1).

Average Effects of the IDD Adoption on Audit Office Sharing of Peer Companies

Dependent variable: *Audit Office Sharing*				
VARIABLES	(1) Logit	(2) Logit	(3) LPM	(4) LPM
Post	**0.079**	**0.044**	**-0.009**	**-0.009**
	(0.886)	**(0.463)**	**(-1.226)**	**(-1.247)**
Δ*Sale*		-0.828***		-0.075***
		(-26.640)		(-25.080)
IndSale		-0.249***		-0.020***
		(-8.782)		(-8.001)
Herfindahl		-1.313***		-0.099***
		(-8.118)		(-8.303)
Margin		0.347***		0.024***
		(3.599)		(3.348)
Capex		0.261***		0.022***
		(10.450)		(9.670)
Age		0.023***		0.002***
		(7.774)		(7.829)
Constant	-1.054**	0.017	0.097***	0.193***
	(-2.059)	(0.029)	(49.340)	(9.526)
Observations	226,600	226,600	226,600	226,600
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Pair Level Clustered	Yes	Yes	Yes	Yes
Pseudo R-squared	0.043	0.058		
Log pseudolikelihood	-67956	-66926		
Adjusted R-squared			0.032	0.041

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In columns (1) and (2), the coefficients of the variable of interest, *Post*, are not significant at the 10% level in the Logit regressions. In columns (3) and (4), I estimate model (1) using LPM. The coefficients of the variable of interest, *Post*, are not significant at the 10% level. The results suggest that, on average, industry rivals do not change auditor sharing behavior following IDD adoption, which implies that the propensity of rival companies to share the same audit office is not significantly affected when the costs of information leakage increase.

Because of the counteracting effect of the IDD on companies' audit sharing decisions, I do not have a directional prediction on the sign of *Post* in H1. The rival company pairings include companies with trade secret and those without. My results are consistent with my empirical predictions in H1.

6.2 The IDD Adoption and Auditor Choice Conditional on Company's Ownership of Trade Secrets (H2)

Table 5 reports the estimation results of model (2).

Table 5 (H2).

Differential Effects of the IDD Adoption on Audit Office Sharing of Peer Companies

Dependent variable: *Audit Office Sharing*		
	(1)	(2)
VARIABLES	Logit	LPM
POST	0.113	-0.002
	(1.179)	(-0.209)
Tradesecret1	0.084*	0.007**
	(1.945)	(2.320)
Post*Tradesecret1	**-0.321*** **	**-0.029*** **
	(-3.656)	(-3.952)
Tradesecret2	0.273***	0.021***
	(4.898)	(5.367)
Post*Tradesecret2	**-0.330*** **	**-0.029*** **
	(-3.444)	(-3.544)
Δ*Sale*	-0.819***	-0.074***
	(-26.290)	(-24.608)
IndSale	-0.263***	-0.021***
	(-9.126)	(-8.291)
Herfindahl	-1.356***	-0.103***
	(-8.333)	(-8.593)
Margin	0.350***	0.023***
	(3.622)	(3.261)
Capex	0.272***	0.023***
	(10.760)	(9.924)
Age	0.025***	0.002***
	(7.879)	(8.017)
	(-3.444)	(-3.544)
Constant	0.041	0.187***
	(0.069)	(9.277)
Observations	226,600	226,600
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.059	
Log pseudolikelihood	-66876	
Adjusted R-squared		0.042

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

Column (1) uses logistic regression, while column (2) uses LPM. I find that both *Post * Tradesecret1* and *Post * Tradesecret2* are negatively significant at 1%. The results suggest that, on average, rival companies with trade secrets are less likely to share the same audit office after their headquarter state adopts the IDD than rival companies without trade secrets.[8]

In column (1), the coefficient on *Post * Tradesecret1* is -0.321. The results show that, *ceteris paribus*, the odds that rival companies share the same audit office when only one of them own trade secrets is 27.46% (=1-exp (-0.321)) lower than those of rival companies without trade secrets following IDD adoption. In addition, the coefficient on *Post * Tradesecret2* is -0.330. The results suggest that when rival companies both have trade secrets, their propensity to share the same audit office state following IDD adoption is 28.11% (=1 - exp (-0.330)) lower than the odds for those that do not owns any trade secret, holding all other independent variables constant.

I also used an LPM to estimate model (2) because the coefficients of the interaction terms in nonlinear models are not their corresponding marginal effects (Ai and Norton 2003). The results from column (2) show the marginal effect of IDD adoption on rival company pairs when only one of them has trade secrets is -0.029, whereas the marginal effect of IDD adoption on rival company pairs when both have trade secrets is -0.029.

The signs of the control variables in the regressions are mostly consistent with those documented in Aobdia (2015). The coefficient on Δ*Sale* is negatively significant at the 1% level. This indicates that a large difference between two rival companies is associated with a lower propensity for auditor sharing. The coefficient on *IndSale* is negatively significant at the 1%

[8] The results related to H2 would be biased if there was a significant change in the frequency of trade secret disclosures in companies' 10-K reports before and after IDD adoption. However, examination of the trend in the disclosures over a six-year window surrounding the year of IDD adoption reveals no significant changes before and after the adoption.

level. This implies that rival companies in an industry with more industry sales are less likely to share audit office states. The coefficient on *Herfindahl* is negative and significant at the 1% level suggesting that companies in highly concentrated industries tend to have lower likelihood of auditor sharing. *Margin* is positively significant at the 1% level indicating companies with higher price cost margin are more likely to share auditor office state. *Margin* is a measure of industry differentiation. Companies that have bigger difference in their industry are more likely to share audit office state. *Capex* is a measure of the barriers to imitation within the industry. It is positively significant at the 1% level, which indicates that companies with higher barriers to imitation within the industry are more likely to share the same audit office state. *Age* is also positively significant at the 1% level. This suggests that rival companies in an industry with a greater average age of companies are more likely to share an audit office state.

6.3 Robustness Checks on the Impact of IDD Adoption and Peer Companies' Auditor Choice Conditional on Companies' Ownership of Trade Secrets

I extend my analysis by performing an extensive set of robustness checks to evaluate whether the results of IDD adoption and auditor choice conditional on companies' ownership of trade secrets are sensitive to different auditor sharing measures.

6.3.1 The Impact of Auditor Mergers and Acquisitions

6.3.1.1 Merger of PW and CL Clients

I check the robustness of my results by considering the merger of Price Waterhouse with Coopers & Lybrand in July 1998. I removed clients whose auditor is either Price Waterhouse or

Coopers & Lybrand. When these two auditors merged into PricewaterhouseCoopers (PWC), the clients of these two auditors could choose to either stay with the merged auditor, PWC, or switch away from PWC to another auditor. Because audit office data is only available in Audit Analytics since 2000, I can only use national level auditor sharing data based on the auditor information obtained from Compustat, which provides the corresponding auditor data in years earlier than 2000, in this robustness check. Therefore, my sample period in Table 6 is from 1997 to 2017.

I replace the audit office sharing measure in model (2) with a national-level auditor sharing measure as the dependent variable. I report the corresponding results in Table 6. The variable *Auditor Sharing National* is coded 1 if two rival companies hire the same auditor and 0 otherwise.

Table 6.

The Impact of the IDD Adoption on Auditor Sharing of Companies Excluding PW and CL Clients

Dependent variable: *Auditor Sharing National*		
	(1)	(2)
VARIABLES	Logit	LPM
POST	0.368***	0.065***
	(7.618)	(8.046)
Tradesecret1	0.022	0.004
	(0.771)	(0.866)
Post*Tradesecret1	**-0.247*** **	**-0.044*** **
	(-5.795)	**(-5.838)**
Tradesecret2	0.117***	0.023***
	(3.505)	(3.750)
Post*Tradesecret2	**-0.363*** **	**-0.065*** **
	(-6.614)	**(-6.637)**
Δ*Sale*	-0.005	-0.001
	(-0.360)	(-0.849)
IndSale	-0.066***	-0.012***
	(-4.511)	(-4.546)
Herfindahl	-0.593***	-0.110***
	(-4.670)	(-4.931)
Margin	0.133***	0.024***
	(4.453)	(4.376)
Capex	0.065***	0.012***
	(6.819)	(7.050)
Age	0.021***	0.004***
	(8.017)	(7.695)
Constant	-1.003***	0.225***
	(-2.713)	(8.558)
Observations	275,640	275,700
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.012	
Log pseudolikelihood	-153274	
Adjusted R-squared		0.014

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In Table 6 columns (1) and (2), I report the results with the interaction terms, *Post * Tradesecret1* and *Post * Tradesecret2*, as the variables of interest using logit and LPM, respectively. I find that both *Post * Tradesecret1* and *Post * Tradesecret2* are negatively significant at the 1% level in the regressions. The results show that rival companies with trade secrets are less likely to share auditors after their headquarter state adopts the IDD. The results are consistent with the main results.

6.3.1.2 The Exclusion of Arthur Andersen's Clients

I also check the robustness of my results by considering the collapse of Arthur Andersen in 2002. Arthur Andersen ended its role as a public auditor due to Enron Scandal in June 2002, and its auditing clients had to switch to other auditors. I removed Arthur Andersen's clients because they were affected by its collapse. I estimate model (2) with a smaller sample (without Arthur Andersen's clients) and report the corresponding results in Table 7.

Table 7.

The Impact of the IDD Adoption on Audit Office Sharing of Companies Excluding Arthur Andersen's Clients

Dependent variable: *Audit Office Sharing*		
	(1)	(2)
VARIABLES	Logit	LPM
POST	0.150	0.001
	(1.437)	(0.086)
Tradesecret1	0.061	0.005*
	(1.359)	(1.675)
Post*Tradesecret1	**-0.323*** **	**-0.032*** **
	(-3.555)	(-3.982)
Tradesecret2	0.260***	0.020***
	(4.579)	(4.993)
Post*Tradesecret2	**-0.338*** **	**-0.031*** **
	(-3.415)	(-3.656)
Δ*Sale*	-0.854***	-0.076***
	(-26.950)	(-25.240)
IndSale	-0.228***	-0.018***
	(-7.585)	(-6.847)
Herfindahl	-1.246***	-0.096***
	(-7.598)	(-7.955)
Margin	0.420***	0.028***
	(4.203)	(3.946)
Capex	0.227***	0.018***
	(8.821)	(8.279)
Age	0.024***	0.002***
	(7.565)	(7.573)
Constant	0.099	0.173***
	(0.163)	(8.228)
Observations	212,379	212,465
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.060	
Log pseudolikelihood	-61932	
Adjusted R-squared		0.043

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In Table 7 columns (1) and (2), I report the results with the interaction terms, *Post * Tradesecret1* and *Post * Tradesecret2*, as the variables of interest using logit and LPM, respectively. I find that both *Post * Tradesecret1* and *Post * Tradesecret2* are negatively at the 1% level in the regressions. The results show that, after removing Andersen's clients, rival companies with trade secrets are less likely to share auditors after their headquarter state adopts the IDD. The results are consistent with the main results.

6.3.2 The Exclusion of Years Related to Sarbanes-Oxley Act

Because a series of corporate governance scandals at the start of the 21st century was highly publicized, the reliability of financial reporting was questioned by regulators and other stakeholders. In response to these concerns, Congress enacted the Sarbanes-Oxley Act (SOX) on July 30, 2002 to both enhance the integrity of the accounting information and restore investor confidence. After the collapse of Arthur Andersen in 2002, many clients switched from Big N auditors to either second-tier auditors, such as Grant Thornton and BDO Seidman, or even smaller third-tier auditing firms (Ettredge, Scholz, and Li 2007; Chang, Cheng, and Reichelt 2010).

In addition, SOX created new requirements for corporate auditing practices. For instance, audit committees of public companies are required to hire independent external auditors and established rules for certain non-audit services that the external auditors cannot perform. The regulation forced some clients to change their auditors.

Therefore, I conduct a robustness check after removing the Sarbanes Oxley years of 2001 and 2002. I report the corresponding results in Table 8.

Table 8.

The Impact of IDD Adoption on Audit Office Sharing of Companies Excluding SOX Years

VARIABLES	(1) Logit	(2) LPM
POST	0.218	0.010
	(1.415)	(0.688)
Tradesecret1	0.068	0.005*
	(1.464)	(1.743)
Post*Tradesecret1	**-0.562*** **	**-0.061*** **
	(-6.055)	**(-6.662)**
Tradesecret2	0.260***	0.019***
	(4.435)	(4.810)
Post*Tradesecret2	**-0.633*** **	**-0.066*** **
	(-6.415)	**(-6.976)**
Δ*Sale*	-0.904***	-0.079***
	(-27.360)	(-25.580)
IndSale	-0.205***	-0.015***
	(-6.520)	(-5.880)
Herfindahl	-1.185***	-0.091***
	(-6.901)	(-7.393)
Margin	0.316***	0.020***
	(3.117)	(2.825)
Capex	0.205***	0.016***
	(7.529)	(7.101)
Age	0.021***	0.002***
	(6.487)	(6.506)
Constant	0.161	0.175***
	(0.265)	(8.326)
Observations	194,102	194,189
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.062	
Log pseudolikelihood	-55280	
Adjusted R-squared		0.045

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In Table 8 columns (1) and (2), I report the results with the interaction terms, *Post * TradeSecret1* and *Post * Tradesecret2*, as the variables of interest using logit and LPM, respectively. I find that both *Post * Tradesecret1* and *Post * Tradesecret2* are negatively significant at the 1% level in the regressions. The results show that rival companies with trade secrets are less likely to share auditors after their headquarter state adopts the IDD, even after excluding years immediately before and during the enactment of SOX.

6.3.3 The IDD Adoption and National-Level Auditor Sharing Outcomes

I replace the audit office sharing measure in model (2) with a national-level auditor sharing measure as the dependent variable. I report the corresponding results in Table 9. The variable *Auditor Sharing National* is coded 1 if two rival companies hire the same auditor, and 0 otherwise. Table 9A reports the results when I use Audit Analytics to collect auditor's information from 2000 to 2017. Table 9B presents the results when I obtain auditor information from Compustat so that I can extend my sample period back to 1997.

In Table 9A columns (1) and (2), I report the results with the interaction terms, *Post * TradeSecret1* and *Post * Tradesecret2*, as the variables of interest using logit and LPM, respectively. I find that both *Post * Tradesecret1* and *Post * Tradesecret2* are negatively significant at the 1% level in the regressions. The results show that rival companies with trade secrets are less likely to share auditors after their headquarter state adopts the IDD.

Table 9.

Differential Effects of IDD Adoption on Auditor Sharing of Companies

Panel A.
Differential Effects of IDD Adoption on Auditor Sharing of Companies Using Audit Analytics Sample (2000 – 2017)

Auditor Sharing National		
	(1)	(2)
VARIABLES	Logit	LPM
Post	0.470***	0.047***
	(6.534)	(4.410)
Tradesecret1	0.036	0.003
	(1.135)	(0.872)
Post * Tradesecret1	**-0.348*** **	**-0.045*** **
	(-5.120)	(-5.112)
Tradesecret2	0.246***	0.032***
	(6.044)	(6.498)
Post * Tradesecret2	**-0.365*** **	**-0.051*** **
	(-4.952)	(-5.293)
Δ*Sale*	-0.770***	-0.112***
	(-29.010)	(-28.380)
IndSale	-0.111***	-0.015***
	(-4.523)	(-4.248)
Herfindahl	-0.516***	-0.071***
	(-4.238)	(-4.462)
Margin	0.347***	0.035***
	(4.235)	(3.585)
Capex	0.091***	0.013***
	(4.969)	(5.011)
Age	0.015***	0.002***
	(4.996)	(4.829)
Constant	1.402***	0.252***
	(2.769)	(8.200)
Observations	258,160	258,240
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.037	
Log pseudolikelihood	-112745	
Adjusted R-squared		0.033

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In Table 9B columns (1) and (2), I report the results with the interaction terms, *Post * TradeSecret1* and *Post * Tradesecret2*, as the variables of interest using logit and LPM, respectively. I find that both *Post * Tradesecret1* and *Post * Tradesecret2* are also negatively significant at the 1% level in the regressions. The results show that rival companies with trade secrets are less likely to share auditors after their headquarter state adopts the IDD.

Table 9 continued.

Panel B.

Differential Effects of IDD Adoption on Auditor Sharing of Companies Using Compustat Sample (1997 – 2017)

Dependent variable = *Auditor Sharing National*		
	(1)	(2)
VARIABLES	Logit	LPM
Post	0.363***	0.064***
	(7.578)	(8.145)
Tradesecret1	0.017	0.004
	(0.594)	(0.709)
Post*tradesecret1	**-0.237*** **	**-0.042*** **
	(-5.604)	**(-5.635)**
Tradesecret2	0.110***	0.021***
	(3.333)	(3.591)
Post*tradesecret2	**-0.355*** **	**-0.063*** **
	(-6.522)	**(-6.552)**
Δ*Sale*	-0.005	-0.001
	(-0.352)	(-0.853)
IndSale	-0.067***	-0.012***
	(-4.591)	(-4.610)
Herfindahl	-0.575***	-0.106***
	(-4.572)	(-4.826)
Margin	0.133***	0.024***
	(4.482)	(4.385)
Capex	0.066***	0.012***
	(6.927)	(7.143)
Age	0.021***	0.004***
	(8.101)	(7.767)
Constant	-1.022***	0.223***
	(-2.768)	(8.611)
Observations	284,271	284,331
Pseudo R-squared	0.012	
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Log pseudolikelihood	-157235	
Adjusted R-squared		0.013

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

6.3.4 The IDD Adoption and State-Level Auditor Sharing Outcomes

I replace the audit office sharing measure in model (2) with a state-level auditor sharing measure as the dependent variable. I choose auditor office sharing within a state as one of my robustness checks because the IDD adoption across different U.S. states are staggered at state levels. When the IDD is adopted in a certain state, both companies whose headquarters are in the state would expect lower employee mobility. In addition, auditors from different audit offices within the same state are very likely to travel, visit, and talk to each other than auditors from the audit offices in different states. Managers are thus more likely to be concerned about proprietary information leakage through state-level auditor sharing than national-level auditor sharing.

I report the corresponding results in Table 10. The variable *Auditor Sharing State* is coded 1 if the auditors of the two rival companies are in the same state, and 0 otherwise.

Table 10.

Differential Impact of IDD Adoption on State-Level Auditor Sharing

Dependent variable = *Auditor Sharing State*		
	(1)	(2)
	Logit	LPM
Post	0.429***	0.037***
	(5.281)	(3.303)
Tradesecret1	0.050	0.004
	(1.432)	(1.253)
Post*Tradesecret1	**-0.339*** **	**-0.037*** **
	(-4.282)	**(-4.103)**
Tradesecret2	0.261***	0.033***
	(5.845)	(6.262)
Post*Tradesecret2	**-0.426*** **	**-0.051*** **
	(-4.966)	**(-5.107)**
Δ*Sale*	-0.763***	-0.105***
	(-26.430)	(-25.780)
IndSale	-0.144***	-0.018***
	(-5.472)	(-5.021)
Herfindahl	-0.608***	-0.078***
	(-4.979)	(-5.291)
Margin	0.374***	0.034***
	(4.128)	(3.420)
Capex	0.110***	0.015***
	(5.486)	(5.383)
Age	0.008**	0.001**
	(2.469)	(2.475)
Constant	-0.053	0.274***
	(-0.091)	(8.901)
Observations	226,600	226,600
Fixed Effects	State, Year	State, Year
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.042	
Log pseudolikelihood	-94,775	
Adjusted R-squared		0.035

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In columns (1) and (2) of Table 10, I report the results with the interaction terms, *Post * TradeSecret1* and *Post * Tradesecret2*, as the variables of interest using logit and LPM, respectively. Both variables are negatively at the 1% level in the regressions, implying that rival companies with trade secrets are less likely to share the same audit office state, i.e., the auditors of the two rival companies are in the same state, after their headquarter state's courts adopt the IDD.

6.3.5 The IDD Adoption and CBSA-Level Auditor Sharing Outcomes.

I replace the audit office sharing measure in model (2) with a core-based statistical area (CBSA) auditor sharing measure as the dependent variable and report the corresponding results in Table 11. The variable *Auditor Sharing CBSA* is coded 1 if the audit offices of two rival companies are in the same CBSA area, and 0 otherwise. I obtain city, state, and county data from the United States Zip Code Database. I use a CBSA and county matching file from the National Bureau of Economics and Research website to acquire the corresponding CBSA area for each city.

Table 11.

Differential Impact of IDD Adoption on CBSA-Level Audit Office Sharing

Dependent variable = *Auditor Sharing CBSA*		
	(1)	(2)
	Logit	LPM
Post	0.429***	0.037***
	(5.281)	(3.303)
Tradesecret1	0.050	0.004
	(1.432)	(1.253)
Post*Tradesecret1	**-0.339*** **	**-0.037*** **
	(-4.282)	**(-4.103)**
Tradesecret2	0.261***	0.033***
	(5.845)	(6.262)
Post*Tradesecret2	**-0.426*** **	**-0.051*** **
	(-4.966)	**(-5.107)**
Δ*Sale*	-0.763***	-0.105***
	(-26.430)	(-25.780)
IndSale	-0.144***	-0.018***
	(-5.472)	(-5.021)
Herfindahl	-0.608***	-0.078***
	(-4.979)	(-5.291)
Margin	0.374***	0.034***
	(4.128)	(3.420)
Capex	0.110***	0.015***
	(5.486)	(5.383)
Age	0.008**	0.001**
	(2.469)	(2.475)
Constant	-0.053	0.274***
	(-0.091)	(8.901)
Observations	226,600	226,600
Fixed Effects	State, Year	State, Year
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.042	
Log pseudo likelihood	-94775	
Adjusted R-squared		0.035

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In columns (1) and (2), I report the results with the interaction terms, *Post * TradeSecret1* and *Post * Tradesecret2*, as the variables of interest using logit and LPM, respectively. I find that both *Post * Tradesecret1* and *Post * Tradesecret2* are negatively significant at the 1% level in the regressions. The results show that rival companies with trade secrets are less likely to share auditors in the same CBSA area after their headquarter state adopts the IDD.

6.3.6 The IDD Adoption and Restricted Audit Office Sharing Outcomes

I use a restricted sample as a robustness check for my main results related to Audit Office Sharing in Model (2). I only keep the rival company pairs that share the same audit office in the prior year. Table 12 shows the results by using such restricted sample in Model (2). Therefore, when *Audit Office Sharing* is coded 1, the two rival companies still share the same audit office. In contrast, when *Audit Office Sharing* is coded 0, at least one of the rival companies avoids sharing the same auditor office by either switching to another auditor office or even another auditor. Therefore, my analysis using such a restricted sample is a change analysis.

Table 12.

Differential Impact of IDD Adoption on Audit Office Sharing (Restricted Sample)

Dependent variable = *Audit Office Sharing*		
	(1)	(2)
	Logit	LPM
Post	0.506***	0.103***
	(5.043)	(6.880)
Tradesecret1	0.161***	0.019***
	(3.452)	(2.941)
Post*Tradesecret1	**-0.612*** **	**-0.083*** **
	(-6.208)	**(-5.686)**
Tradesecret2	0.207***	0.034***
	(3.502)	(3.584)
Post*Tradesecret2	**-0.606*** **	**-0.095*** **
	(-5.734)	**(-5.704)**
Δ*Sale*	-0.578***	-0.105***
	(-15.470)	(-15.370)
IndSale	-0.030	-0.004
	(-0.897)	(-0.721)
Herfindahl	-0.288*	-0.048*
	(-1.648)	(-1.649)
Margin	0.629***	0.074***
	(6.111)	(4.838)
Capex	0.030	0.007
	(1.180)	(1.562)
Age	0.006*	0.001
	(1.670)	(1.484)
Constant	-0.851	0.199***
	(-1.094)	(4.121)
Observations	72,389	72,427
Fixed Effects	State, Year	State, Year
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.075	
Log pseudolikelihood	-37904	
Adjusted R-squared		0.081

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In columns (1) and (2), the coefficients of my variables of interest, *Post * TradeSecret1* and *Post * Tradesecret2*, are both negatively at the 1% level in the regressions. The results show that rival companies with trade secrets that share the same audit office in the prior year are less likely to share the same audit office after the companies headquarter state courts adopt the IDD. The results suggest that rival companies with trade secrets that hire the same audit office switch to a different audit office of the same auditor or a different auditor after the company's home state adopts the IDD.

6.3.7 Differentiate IDD Adoption from IDD Rejection

In the main analysis, two types of scenarios exist when the variable *Post* is zero. It could be that peer companies' headquarter state[9] has never adopted the IDD before, or that the peer companies' headquarter state adopted the IDD before but rejected the IDD later. For instance, the state of Florida rejected the IDD on May 21, 2001; the state of Michigan rejected the IDD on April 30, 2002; and the state of Texas rejected the IDD on April 3, 2003 (See Appendix B for details).

I use the following model to estimate a pairwise regression for each firm-peer-year combination and test the probability of sharing the same audit office between two rival companies with trade secrets.

$$Audit\ Office\ Sharing_{i,j,t} = \alpha + \beta_1\, Adopt\ + \beta_2\, Reject + \beta_3\, Tradesecret1\ + \beta_4\, Tradesecret2 + \beta_5\, Adopt * Tradesecret1 + \beta_6\, Adopt * Tradesecret2 + \beta_7\, Reject * Tradesecret1 + \beta_8\, Reject * Tradesecret2 + \beta_9\, \Delta Sale + \beta_{10}\, IndSale + \beta_{11}\, Herfindahl + \beta_{12}\, Margin + \beta_{13}\, Capex + \beta_{14}\, Age + Year\ fe + State\ fe + \epsilon. \quad (3)$$

[9] I define peer companies to be two companies that are in the same NAICS-defined industry group and that share the same home state. In other words, the headquarters of these two peer companies are in the same state. Therefore, I refer to the state of two companies' headquarters as "peer companies headquarter state."

Compared to model (2), model (3) includes two new variables, *Adopt* and *Reject*, to identify the cases when peer companies' headquarter state rejects the IDD. *Adopt* is 1 when peer companies' headquarter state adopts the IDD but do not reject the IDD in that year, and 0 otherwise. *Reject* is 1 when peer companies' headquarter state rejects the IDD, and 0 otherwise. Consistent with H2, I predict that peer companies with trade secrets are less likely when their headquarter states adopt the IDD. In contrast, when peer companies' headquarter state rejects the IDD, the channel of information transfer through employee movement will become available. In this case, the costs of information disclosure will decrease. I predict that peer companies with trade secrets are more likely to share an audit office to benefit from industry specialization and will be less concerned about proprietary information leakage potentially through audit office sharing. Therefore, I expect β_5 and β_6 to be negative, and β_7 and β_8 to be positive. I report the corresponding empirical results in Table 13.

Table 13.

The Impact of IDD Adoption and IDD Rejection on Audit Office Sharing

Dependent Variable: *Audit Office Sharing*		
	(1)	(2)
VARIABLES	Logit	LPM
Adopt	0.397***	0.032***
	(4.930)	(2.821)
Reject	-0.536***	-0.055***
	(-3.436)	(-4.333)
Tradesecret1	0.050	0.005
	(1.388)	(1.278)
Tradesecret2	0.269***	0.036***
	(5.950)	(6.632)
Adopt * Tradesecret1	**-0.307*** **	**-0.034*** **
	(-3.879)	**(-3.729)**
Adopt * Tradesecret2	**-0.388*** **	**-0.048*** **
	(-4.528)	**(-4.802)**
Reject * Tradesecret1	**0.400** **	**0.033** **
	(2.285)	**(2.328)**
Reject * Tradesecret2	**0.450** **	**0.031**
	(2.002)	**(1.622)**
Δ*Sale*	-0.703***	-0.058**
	(-14.240)	(-2.533)
IndSale	-0.141***	-0.017***
	(-5.528)	(-5.040)
Herfindahl	-0.732***	-0.094***
	(-6.392)	(-7.017)
Margin	0.352***	0.032***
	(4.736)	(3.542)
Capex	0.111***	0.015***
	(5.623)	(5.441)
Age	0.013***	0.002***
	(4.626)	(4.955)
Constant	-0.233	0.227***
	(-0.405)	(6.610)
Observations	226,600	226,600
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.042	
Log pseudolikelihood	-94769	
Adjusted R-squared		0.032

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

In column (1) of Table 13, I report the results with the interaction terms, *Adopt * TradeSecret1*, *Adopt * Tradesecret2*, *Reject * TradeSecret1* and *Reject * Tradesecret2* as the variables of interest using logit regression. Consistent with my prediction, the coefficients of the two-way interaction terms, *Adopt * TradeSecret1* and *Adopt * Tradesecret2*, are both negatively significant at the 1% level, while the coefficients of the two-way interaction terms, *Reject * TradeSecret1* and *Reject * Tradesecret2*, are both positively significant at the 1% level. The results suggest that rival companies with trade secrets are less likely to share the same audit office after the headquarter state adopts the IDD and more likely to share the same audit office after the headquarter state courts reject the IDD.

CHAPTER 7

CROSS-SECTIONAL EVIDENCE

7.1 Rival Companies with Big N auditors Versus Those with Non-Big N Auditors

My first cross-sectional analysis is related to whether peer companies are audited by Big N auditors. Specifically, I investigate whether peer companies with trade secrets that hire Big N auditors are more or less likely to share auditors than peer companies that do not hire Big N auditors.

On the one hand, Big N auditors intend to protect their brand name and reputations. Big N auditors have a much larger number of clients, so they have more to lose if they failed to discover a breach or failed to disclose a discovered breach of a client due to lack of auditor independence (DeAngelo 1981). According to DeAngelo (1981), auditor size itself changes auditor's incentives; the larger the auditor is, the less incentive the auditor has to take the risks to behave opportunistically. Big N auditors "have greater reputation capitals to protect" (Francis and Krishnan 1999, p. 140). In addition, Big N auditors try to avoid costly litigation. Khurana and Raman (2004) find that higher exposure to the litigation risk leads to higher audit quality of Big N auditors. Therefore, it is possible that after peer companies' home states adopt the IDD, the channel of information leakage through employee movement is restricted. Companies with trade secrets are likely to restrain the other possible channels of information leakage through auditors by engaging in Big N auditor sharing because Big N auditors have greater reputation capital and avoid potential costly litigation due to clients' proprietary information transfer.

On the other hand, Dhaliwal et al. (2016) find that a company is more likely to acquire a target when the acquirer and the target share the same Big N auditor. Moreover, shared Big N

auditor deals have significantly smaller premiums and target returns as well as bigger bidder returns and deal completion rates. This implies that shared Big N auditors helps the flow of information between bidders and targets. Furthermore, large international auditors share knowledge, best practices, and resources among different engagement offices (Whitworth and Lambert 2014). Seavey, Imhof, and Westfall (2018) find that it is common for the Big 4 audit partners in different offices to share knowledge and such sharing is intended to help with audit services of the clients. Prior to the companies' home state adoption of the IDD, more information could flow among rival companies audited by Big N auditors than among rival companies audited by non-Big N auditors. However, after a peer company's home state adopts the IDD, same-industry rivals with trade secrets that are audited by Big N auditors could be more concerned about the information flow due to sharing the same Big N audit office because one channel of information transfer (i.e., information transfer through employee movement) is blocked. Therefore, it is also possible that same-industry rivals with proprietary information are less likely to share a Big N audit office following IDD adoption.

Therefore, it is an empirical question whether peer companies would feel more comfortable to share Big N audit office to avoid proprietary information leakage considering Big N auditors' brand reputation and exposure to high litigation cost, or whether clients of Big N auditors are concerned the auditors may informally or accidentally disclose clients' sensitive information in different platforms of trainings and sharing.

I use the following model to estimate a pairwise regression for each firm-peer-year combination and test the probability of sharing the same audit office between two rival companies with trade secrets.

$$
\begin{aligned}
&Audit\ Office\ Sharing_{i,j,t} \\
&\quad = \alpha + \beta_1\, Post\ +\ \beta_2\, Tradesecret1\ + \beta_3\, Post * Tradesecret1 \\
&\quad +\ \beta_4\, Tradesecret2 + \beta_5\, Post * Tradesecret2 \\
&\quad + \beta_6\, BigN2 + \beta_7\, Post * BigN2 +\ \beta_8\, BigN2 * Tradesecret1 + \beta_9\, BigN2 \\
&\quad * Tradesecret2\ + \beta_{10}\, Post * Tradesecret1 * BigN2 +\ \beta_{11}\, Post \\
&\quad * Tradesecret2 * BigN2 +\ \beta_{12}\, \Delta Sale \\
&\quad + \beta_{13}\, IndSale +\ \beta_{14}\, Herfindahl + \beta_{15} Margin + \beta_{16}\, Capex +\ \beta_{17}\, Age \\
&\quad + Year\ fe + State\ fe + \epsilon
\end{aligned}
\tag{4}
$$

In this analysis, all variables are the same as those in model (2) except the variables related to Big N auditors. *BigN2* is a dummy variable indicating whether rival companies hire Big N auditors or not. *BigN2* is coded 1 when rival companies both hire Big N auditors, and 0 otherwise. I do not include a directional prediction over the signs of β_{10} and β_{11}. I report the corresponding results in Table 14.

Table 14.

Company Pairs Both with Big N Auditors Versus Company Pairs That Do Not Both Have Big N Auditors on Audit Office Sharing

Dependent variable: *Audit Office Sharing*		
	(1)	(2)
VARIABLES	Logit	LPM
POST	-0.047	-0.028***
	(-0.265)	(-3.859)
Tradesecret1	-0.382***	-0.000
	(-3.634)	(-0.076)
*Post*Tradesecret1*	0.026	-0.036***
	(0.131)	(-6.428)
Tradesecret2	-0.612***	-0.001
	(-5.968)	(-0.415)
*Post*Tradesecret2*	-0.221	-0.058***
	(-1.139)	(-9.485)
BigN2	2.383***	0.138***
	(31.86)	(31.390)
*Post*BigN2*	-0.092	0.020**
	(-0.547)	(2.087)
*BigN2*Tradesecret1*	0.511***	0.013**
	(4.720)	(2.046)
*BigN2*Tradesecret2*	0.790***	0.017***
	(8.036)	(3.300)
Post*Tradesecret1*BigN2	**-0.226**	**0.018**
	(-1.067)	**(1.464)**
Post*Tradesecret2*BigN2	**-0.053**	**0.058*****
	(-0.267)	**(5.124)**
Δ*Sale*	-0.239***	-0.020***
	(-7.295)	(-7.158)
IndSale	-0.204***	-0.016***
	(-7.259)	(-6.760)
Herfindahl	-1.108***	-0.087***
	(-6.742)	(-7.946)
Margin	0.389***	0.027***
	(3.992)	(4.222)
Capex	0.220***	0.017***
	(9.176)	(8.302)
Age	0.008***	0.001***
	(2.672)	(3.628)

Table 14 continued.

Constant	-3.119***	0.077***
	(-4.796)	(4.187)
Observations	226,600	226,600
Year FE	Yes	Yes
State FE	Yes	Yes
Pair Level Clustered	Yes	Yes
Pseudo R-squared	0.183	
Log pseudolikelihood	-58025	
Adjusted R-squared		0.106

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs.

Table 14 provides results of the cross-sectional difference over the impact of the IDD adoption on auditor sharing of rival companies between those who hire Big N auditors and those who do not. In columns (1) and (2), I report the results with the interaction terms, *Post * Tradesecret1 * BigN2* and *Post * Tradesecret2 * BigN2*, using logit and LPM, respectively. The three-way interaction terms, *Post * Tradesecret1 * BigN2*, is positively significant at the 1% level in the LPM, while the three-way interaction terms, *Post * Tradesecret1 * BigN2*, are not significant at the 10% level. The results show same-industry rivals both with proprietary information that both hire BigN auditors become more likely to share an auditor office with another Big N audit office after the companies headquarter state adopts the IDD, when the costs of information leakage increase.

7.2 Rival Companies with Audit Committee (AC) Experts Versus Those without AC Experts

My second cross-sectional analysis is related to whether companies have audit committee experts. Prior literature finds that the monitoring roles of audit committee are affected by not only the accounting and financial knowledge, but also nonaccounting expertise such as business and industry knowledge (Dhaliwal, Naiker, and Navissi 2010). The Sarbanes-Oxley Act (SOX) has imposed increased responsibility, independence, and financial expertise on audit committee in monitoring the financial reporting process. Section 407 of SOX requires that the SEC should mandate public companies to disclose whether they have a financial expert on their audit committees, or provide reasons for the absence of a financial expert on the audit committee. The SEC adopted a broader definition of financial expertise that includes both direct accounting expertise and supervisory financial expertise. Prior literature suggests the role and characteristics of financial expertise of AC members affect financial reporting quality (e.g. Zhang, Zhou, and Zhou 2007; Krishnan and Visvanathan 2008; Dhaliwal, Naiker, and Navissi 2010).

In addition, companies benefit from the audit committee industry expertise because relevant industry insight and knowledge allows the audit committee industry experts to oversee their external auditors' activities more effectively and efficiently within a particular industry (Cohen, Hoitash, Krishnamoorthy, and Wright 2014). According to Cohen et al. (2014), audit committee members with industry expertise can improve audit committee effectiveness in terms of better financial reporting quality. The industry knowledge helps audit committees and companies to adequately understand and monitor any complexities in industry-specific accounting and financial reporting issues and risks. Peer companies with audit committee industry experts may be more capable of processing and sharing information with the external auditors in in the areas of accounting and financial reporting that may be unique to industries.

Therefore, I incorporate three kinds of audit committee expertise in my second cross-sectional analyses: (1) industry specialty, (2) accounting financial expertise, and (3) supervisory financial expertise.

I use the following model to estimate a pairwise regression for each firm-peer-year combination and test the probability of sharing the same audit office between two rival companies with trade secrets. In this analysis, all variables are the same as those in model (2) except the variables to measure the AC expertise of the peer companies. The new variable, *ACExpert*, is either a dummy variable or a numerical variable to capture the peer companies' status related to audit committee expertise, including industry expertise, accounting financial expertise, and supervisory financial expertise. My study provides new evidence over the monitoring role of AC industry expert on the guard of proprietary information in the companies. I report the corresponding results in Table 15 through Table 17.

$$
\begin{aligned}
&Audit\ Office\ Sharing_{i,j,t} \\
&\quad = \alpha + \beta_1\, Post\ + \beta_2\, Tradesecret1\ + \beta_3\, Post * Tradesecret1 \\
&\quad + \beta_4\, Tradesecret2 + \beta_5\, Post * Tradesecret2 \\
&\quad + \beta_6\, ACExpert + \beta_7\, Post * ACExpert + \beta_8\, ACExpert * Tradesecret1 \\
&\quad + \beta_9\, ACExpert * Tradesecret2 + \beta_{10}\, Post * ACExpert * Tradesecret1 \\
&\quad + \beta_{11}\, Post * ACExpert * Tradesecret2 + \beta_{12}\, \Delta Sale + \beta_{13}\, IndSale \\
&\quad + \beta_{14}\, Herfindahl + \beta_{15} Margin + \beta_{16}\, Capex + \beta_{17}\, Age + Year\ fe \\
&\quad + State\ fe + \epsilon
\end{aligned}
\tag{5}
$$

7.2.1 Industry Expertise on Audit Committees

Both practitioners and academics calls for emphasis on the importance of nonaccounting expertise, such as business and industry expertise, on the audit committee (Bédard and Gendron 2010; Cohen et al. 2014). On the one hand, industry specialists in the audit committees are

highly appreciated because they are more proficient to address complex accounting issues that may be unique to particular industries (Deloitte Development 2010). Such specialists are also considered one of best qualified audit committee members (Olson 1999). Because industry experts with domain-specific knowledge on the audit committees improves the AC's effectiveness in monitoring the financial reporting processes and overseeing external auditors, they would ensure that only relevant and proper industry-specific and financial information would be shared with the external auditors and that the companies' proprietary information is safely guarded within the company instead of being improperly disclosed to outsiders. In this way, managers in the companies that have industry experts in their audit committees would be less concerned about proprietary information disclosure potentially through sharing the same audit office with industry peers. Therefore, I argue that AC members with industry expertise are more likely to ensure that the companies provide and monitor relevant industry-related estimates to their external auditors without sacrificing proprietary information to the auditors. I predict that same-industry peer companies with proprietary information are more likely to share an audit office following IDD adoption when these companies have AC industry experts. The *ACExpert* variables in Model (5) are *IndExp* and *IndExpNum*. *IndExp* is coded 1 if either of the peer companies has at least one industry experts on the audit committees, and 0 otherwise. I follow Cohen et al. (2014) to identify whether an audit committee has industry expertise. If an audit committee member has been employed by companies that have the same two-digit SIC code of the company, this member is considered an audit committee industry expert. *IndExpNum* is the average number of industry experts on the audit committees of two peer companies. It measures the strength of the AC industry expertise in the peer companies. Based on my previous argument

in the earlier paragraph, I expect the coefficients of the three-way interaction terms of *Post* and proxies for trade secret ownership and industry expertise, β_{10} and β_{11}, to be positive.

Table 15 provides results of the cross-sectional difference over the impact of the IDD adoption on audit office sharing of peer companies between those with AC Industry Experts and those without AC Industry Experts.

Table 15.

Company Pairs Both with Audit Committee Industry Expert Versus Company Pairs That Do Not Have Audit Committee Industry Expert on Audit Office Sharing

VARIABLES	(1) Logit	(2) Logit	(3) LPM	(4) LPM
POST	-1.657	-1.710		
	(-1.357)	(-1.390)		
Tradesecret1	0.595	0.605	0.031	0.033
	(1.538)	(1.617)	(1.423)	(1.529)
*Post*Tradesecret1*	0.050	0.046	0.004	0.002
	(0.055)	(0.051)	(0.082)	(0.044)
Tradesecret2	0.651	0.511	0.034	0.026
	(1.561)	(1.239)	(1.407)	(1.049)
*Post*Tradesecret2*	0.412	0.547	0.0431	0.050
	(0.443)	(0.584)	(0.783)	(0.902)
IndExp	0.961		0.064	
	(1.439)		(1.038)	
*Post*IndExp*	-13.360***		-0.206**	
	(-9.620)		(-2.135)	
*IndExp*Tradesecret1*	0.019		0.054	
	(0.026)		(0.703)	
*IndExp*Tradesecret2*	-1.248*		-0.086	
	(-1.780)		(-1.345)	
IndExpNum		3.255		0.194
		(0.788)		(0.586)
*Post*IndExpNum*		-101.900***		-1.287*
		(-9.743)		(-1.898)
*IndExpNum*Tradesecret1*		0.359		0.283
		(0.080)		(0.683)
*IndExpNum*Tradesecret2*		-3.810		-0.236
		(-0.908)		(-0.703)
Post*IndExp*Tradesecret1	**11.080*** **		**-0.038**	

Table 15 continued.

	(6.976)		**(-0.345)**	
Post*IndExp*Tradesecret2	**12.080*** **		**0.075**	
	(7.947)		**(0.700)**	
Post*IndExpNum*Tradesecret1		**88.160*** **		**-0.098**
		(7.288)		**(-0.134)**
Post*IndExpNum*Tradesecret2		**91.050*** **		**0.220**
		(7.822)		**(0.281)**
Δ*Sale*	-0.924***	-0.925***	-0.084***	-0.084***
	(-5.608)	(-5.652)	(-5.192)	(-5.182)
IndSale	-0.062	-0.038	-0.007	-0.005
	(-0.395)	(-0.246)	(-0.606)	(-0.469)
Herfindahl	-1.387	-1.287	-0.080	-0.071
	(-1.295)	(-1.235)	(-1.282)	(-1.171)
Margin	0.808	0.935	0.051	0.061
	(0.857)	(0.988)	(0.900)	(1.060)
Capex	0.255**	0.232**	0.020**	0.018*
	(2.210)	(1.997)	(2.136)	(1.929)
Age	-0.045**	-0.048***	-0.003***	-0.004***
	(-2.520)	(-2.646)	(-2.651)	(-2.842)
Constant	0.040	-0.174	0.072	0.058
	(0.027)	(-0.118)	(0.747)	(0.609)
Observations	7,188	7,188	7,303	7,303
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Pair Level Clustered	Yes	Yes	Yes	Yes
Pseudo R-squared	0.077	0.075		
Log pseudolikelihood	-2179	-2185		
Adjusted R-squared			0.052	0.050

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs. *POST* in the table below does not show coefficients in columns (3) and (4) because *POST* is omitted because of collinearity with the fixed effects.

In column (1), I report the results with the interaction terms, *Post * Tradesecret1 * IndExp* and *Post * Tradesecret2 * IndExp*, using a logit regression. The three-way interaction terms, *Post * Tradesecret1 * IndExp* and *Post * Tradesecret2 * IndExp*, are both positively significant at the 1% level in the logit regressions. In column (2), I report the results with the

interaction terms, *Post * Tradesecret1 * IndExpNum* and *Post * Tradesecret2 * IndExpNum*, using a logit regression. The three-way interaction terms, *Post * Tradesecret1 * IndExp* and *Post * Tradesecret2 * IndExp*, are both positively significant at the 1% level in the logit regressions. In columns (3) and (4), the three-way interaction terms are not significant at the 10% level in the LPM. The results show that same-industry rivals with industry experts in the AC become marginally more likely to share an audit office after the headquarter state adopts the IDD, when the costs of information leakage increase.

7.2.2 Accounting Financial Expertise on Audit Committee

The financial expertise of audit committee members has received enormous attention from regulators and academics (e.g., Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees 1999; DeZoort, Hermanson, Archambeault, and Reed 2002; Sarbanes-Oxley Act of 2002). Prior literature finds that accounting experts served on audit committees are more effective in monitoring the financial reporting processes of companies (Dhaliwal et al. 2010). Accounting financial experts are equipped with deep knowledge of accounting concepts and the auditing process. Therefore, because accounting experts should have abundant experience in preparing or auditing financial statements, they can oversee important financial reporting areas by providing more relevant accounting and financial information to the external auditors without unintentionally disclosing sensitive proprietary information to outsiders. Therefore, companies with accounting experts are less concerned about information leakage through auditor sharing in the post IDD periods when costs of information disclosure increase than those companies without accounting experts. I predict that same-industry peer companies with proprietary information are more likely to share an audit office

following IDD adoption when these companies have accounting financial experts in audit committees.

The *ACExpert* variables in model (5) are *AFE, AFENum,* and *AFERatio*. *AFE* is coded 1 if either of the peered companies have at least one Accounting Financial Expert (AFE) on the audit committees, and 0 otherwise. I follow Cohen et al. (2014) to identify whether an audit committee has AFE. An audit committee member is an accounting financial expert if their biography includes at least one of the following qualifications: certified public accountant, chief financial officer, auditor, chief accounting officer, controller, treasurer, or vice president-finance. The data are from BoardEx and Compustat. *AFENum* is the average number of AFEs on the audit committees of two peer companies. *AFERatio* is the average ratio of AFEs on the audit committees of two peer companies. Both *AFENum* and *AFERatio* measure the strength of the AFE on the audit committee in the peer companies. Based on my previous argument in the earlier paragraph, I expect the coefficients of the three-way interaction terms of *Post* and proxies for trade secret ownership and accounting financial expertise, β_{10} and β_{11}, to be positive.

Table 16 provides results of the cross-sectional difference over the impact of the IDD adoption on auditor sharing of rival companies between those with AC Accounting Financial Experts (AFE) and those without AC AFE.

Table 16.

Company Pairs Both with Audit Committee Accounting Financial Experts Versus Company Pairs That Do Not Have Audit Committee Accounting Financial Experts on Audit Office Sharing

Dependent variable: *Audit Office Sharing*						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Logit	Logit	Logit	LPM	LPM	LPM
POST	0.112	-2.231*	-1.925	-0.002		
	(1.167)	(-1.685)	(-1.476)	(-0.213)		
Δ*Sale*	-0.819***	-0.952***	-0.950***	-0.074***	-0.085***	-0.085***
	(-26.290)	(-5.878)	(-5.859)	(-24.680)	(-5.236)	(-5.223)
IndSale	-0.262***	-0.009	-0.019	-0.021***	-0.004	-0.005
	(-9.096)	(-0.060)	(-0.124)	(-8.266)	(-0.349)	(-0.406)
Herfindahl	-1.351***	-1.299	-1.260	-0.103***	-0.072	-0.071
	(-8.308)	(-1.315)	(-1.285)	(-8.577)	(-1.245)	(-1.236)
Margin	0.348***	1.239	1.207	0.023***	0.086	0.084
	(3.605)	(1.387)	(1.315)	(3.243)	(1.519)	(1.440)
Capex	0.272***	0.189*	0.194*	0.023***	0.016*	0.016*
	(10.730)	(1.700)	(1.740)	(9.905)	(1.727)	(1.765)
Age	0.025***	-0.045**	-0.046***	0.002***	-0.004***	-0.004***
	(7.888)	(-2.573)	(-2.614)	(8.027)	(-2.837)	(-2.865)
Tradesecret1	0.083*	0.775**	0.804**	0.007**	0.063**	0.063**
	(1.911)	(1.970)	(2.063)	(2.286)	(2.384)	(2.422)
*Post*Tradesecret1*	-0.323***	-0.249	-0.256	-0.030***	-0.037	-0.032
	(-3.674)	(-0.269)	(-0.280)	(-3.972)	(-0.657)	(-0.572)
Tradesecret2	0.269***	0.231	0.283	0.021***	0.010	0.012
	(4.810)	(0.546)	(0.674)	(5.278)	(0.357)	(0.454)
*Post*Tradesecret2*	-0.328***	0.923	0.819	-0.029***	0.079	0.075
	(-3.419)	(0.985)	(0.878)	(-3.532)	(1.377)	(1.286)
AFE	-0.916*			-0.039***		
	(-1.755)			(-3.158)		
*Post*AFE*	-11.020***			-0.175***		
	(-13.560)			(-7.877)		
*AFE*Tradesecret1*	0.386			0.010		
	(0.567)			(0.474)		
*AFE*Tradesecret2*	0.965*			0.042**		
	(1.783)			(2.423)		
Post*AFE*Tradesecret1	**11.860*** **			**0.233*** **		
	(9.746)			**(2.673)**		
Post*AFE*Tradesecret2	**11.190*** **			**0.194*** **		
	(12.230)			**(3.647)**		
AFENum		-0.416			-0.010	

Table 16 continued.

		(-0.886)			(-0.456)	
*Post*AFENum*		10.380***			-0.130	
		(-8.398)			(-1.313)	
*AFENum*Tradesecret1*		-0.632			-0.056*	
		(-0.972)			(-1.867)	
*AFENum*Tradesecret2*		0.513			0.017	
		(1.042)			(0.692)	
Post*AFENum*Tradesecret1		**11.780*** **			**0.228***	
		(7.250)			**(1.651)**	
Post*AFENum*Tradesecret2		**9.740*** **			**0.068**	
		(7.390)			**(0.630)**	
AFERatio			-0.550			0.015
			(-0.363)			(0.190)
*Post*AFERatio*			-53.480***			-0.408
			(-9.031)			(-0.784)
*AFERatio*Tradesecret1*			-2.588			-0.201*
			(-1.160)			(-1.825)
*AFERatio*Tradesecret2*			0.754			-0.001
			(0.471)			(-0.007)
Post*AFERatio*Tradesecret1			**57.250*** **			**0.635**
			(8.127)			**(1.049)**
Post*AFERatio*Tradesecret2			**51.600*** **			**0.228**
			(8.209)			**(0.409)**
Constant	0.037	-0.063	-0.250	0.187***	0.036	0.043
	(0.062)	(-0.043)	(-0.171)	(9.271)	(0.390)	(0.456)
Observations	226,600	7,188	7,188	226,600	7,303	7,303
R-squared				0.042	0.055	0.054
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Pair Level Clustered	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.059	0.072	0.071			
Log pseudolikelihood	-66872	-2192	-2194			
Adjusted R-squared				0.042	0.047	0.046

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs *POST* in the table below does not show coefficients in columns (3) and (4) because *POST* is omitted because of collinearity with the fixed effects.

.

In column (1), I report the results with the interaction terms, *Post * Tradesecret1 * AFE*, *Post * Tradesecret2 * AFE,* using a logit regression. The three-way interaction terms, *Post * Tradesecret1 * AFE* and *Post * Tradesecret2 * AFE,* are both positively significant at the 1% level in the logit regressions. The corresponding coefficients of these two interaction terms in the LPM, shown in column (4), are also positively significant at the 1% level.

Similarly, in columns (2) and (3), I report the results with the interaction terms, *Post * Tradesecret1 * AFENum*, *Post * Tradesecret2 * AFENum*, *Post * Tradesecret1 * AFERatio*, *Post * Tradesecret2 * AFERatio*, using logit regressions. They are all positively significant at the 1% level. In columns (4) and (5), the three-way interaction terms are mostly significant at the 10% level in the LPM. But in column (6), *Post * Tradesecret1 * AFERatio* and *Post * Tradesecret2 * AFERatio* are not significant.

Overall, the results show same-industry rivals with accounting financial expertise on Audit Committee become more likely to share an audit office after the headquarter state adopts the IDD, when the costs of information leakage increase.

7.2.3 Supervisory Financial Expertise on Audit Committee

According to the final rules adopted by the SEC, an AC member is still broadly considered a financial expert if they have professional experience in supervising the preparation of financial statements. Examples of such roles include chief executive officer, chairman of the board, and company president. Prior literature documents that additional presence of supervisory financial experts in audit committees do not incrementally contribute to financial reporting quality such as accruals quality (Dhaliwal et al 2010). The findings seem to suggest that

supervisory financial experts may lack first-hand accounting expertise to directly apply to the complex financial reporting and auditing area. The expected roles of supervisory financial experts in improving AC effectiveness and monitoring external auditors are limited. Following this line of analysis, I do not expect any role of supervisory financial experts in reducing managers' concern about proprietary information leakage through auditor sharing.

The *ACExpert* variables are *SFE, SFENum,* and *SFERatio*. *SFE* is coded 1 if either of the peered companies have at least one Supervisory Financial Expert on the audit committees, and 0 otherwise. I follow Cohen et al. (2014) to identify whether an audit committee has an SFE. Audit committee members who are supervisory financial experts, but are not industry experts, where an audit committee member is a supervisory financial expert if his/her biography indicates that he/she has at least one of the following qualifications: chief executive officer, chief operating officer, chairman of the board, or a president of a company and is not an accounting financial expert. The data are from BoardEx and Compustat. *SFENum* the average number of SFEs on the audit committees of two peer companies. *SFERatio* is the average ratio of SFEs on the audit committees of two peer companies. Both *SFENum* and *SFERatio* measure the strength of the AFE on the audit committee in the peer companies.

Based on my previous argument in the earlier paragraph, I expect coefficients of the three-way interaction terms of *Post* and proxies for trade secret ownership and accounting financial expertise, β_{10} and β_{11}, to be insignificant.

Table 17 provides results of the cross-sectional difference over the impact of the IDD adoption on auditor sharing of rival companies between those with AC Supervisory Financial Experts (SFE) and those without AC SFE.

Table 17.

Company Pairs Both with Audit Committee Supervisory Financial Experts Versus Company Pairs That Do Not Have Audit Committee Supervisory Financial Experts on Audit Office Sharing

Dependent variable: *Audit Office Sharing*						
VARIABLES	(1) Logit	(2) Logit	(3) Logit	(4) LPM	(5) LPM	(6) LPM
POST	0.110	-1.483	-1.555	-0.002		
	(1.151)	(-1.160)	(-1.239)	(-0.219)		
Δ*Sale*	-0.820***	-0.946***	-0.945***	-0.074***	-0.085***	-0.086***
	(-26.300)	(-5.833)	(-5.798)	(-24.690)	(-5.195)	(-5.225)
IndSale	-0.261***	-0.058	-0.064	-0.021***	-0.008	-0.008
	(-9.056)	(-0.376)	(-0.415)	(-8.246)	(-0.683)	(-0.672)
Herfindahl	-1.348***	-1.152	-1.229	-0.102***	-0.066	-0.071
	(-8.292)	(-1.183)	(-1.260)	(-8.558)	(-1.134)	(-1.230)
Margin	0.348***	1.129	1.075	0.023***	0.081	0.079
	(3.598)	(1.130)	(1.122)	(3.234)	(1.379)	(1.365)
Capex	0.271***	0.209*	0.220*	0.0225***	0.017*	0.018*
	(10.700)	(1.876)	(1.943)	(9.879)	(1.860)	(1.890)
Age	0.024***	-0.051***	-0.050***	0.002***	-0.004***	-0.004***
	(7.759)	(-2.783)	(-2.708)	(7.908)	(-3.199)	(-3.050)
Tradesecret1	0.078*	0.855	0.929*	0.006**	0.039	0.045
	(1.778)	(1.595)	(1.749)	(2.168)	(1.167)	(1.334)
*Post*Tradesecret1*	-0.325***	-0.668	-0.598	-0.030***	-0.045	-0.025
	(-3.678)	(-0.642)	(-0.585)	(-3.996)	(-0.493)	(-0.296)
Tradesecret2	0.266***	0.355	0.423	0.021***	0.000	0.005
	(4.744)	(0.701)	(0.808)	(5.225)	(0.009)	(0.163)
*Post*Tradesecret2*	-0.332***	0.643	0.650	-0.029***	0.078	0.092
	(-3.445)	(0.626)	(0.639)	(-3.561)	(0.890)	(1.093)
SFE	-0.642			-0.031*		

Table 17 continued.

	(-1.236)			(-1.649)		
*Post*SFE*	0.220			-0.007		
	(0.277)			(-0.126)		
*SFE*Tradesecret1*	0.814			0.044**		
	(1.623)			(2.160)		
*SFE*Tradesecret2*	0.786			0.044**		
	(1.478)			(2.005)		
Post*SFE*Tradesecret1	**-0.045**			**0.021**		
	(-0.055)			**(0.384)**		
Post*SFE*Tradesecret2	**-0.143**			**0.022**		
	(-0.174)			**(0.399)**		
SFENum		0.247			0.009	
		(0.696)			(0.373)	
*Post*SFENum*		-0.599			-0.025	
		(-1.144)			(-0.607)	
*SFENum*Tradesecret1*		-0.124			0.006	
		(-0.374)			(0.288)	
*SFENum*Tradesecret2*		-0.009			0.011	
		(-0.024)			(0.445)	
Post*SFENum*Tradesecret1		**0.608**			**0.022**	
		(1.033)			**(0.497)**	
Post*SFENum*Tradesecret2		**0.159**			**-0.014**	
		(0.289)			**(-0.318)**	
SFERatio			1.015			0.031
			(0.684)			(0.304)
*Post*SFERatio*			-1.859			-0.027
			(-0.857)			(-0.179)
*SFERatio*Tradesecret1*			-0.754			0.004
			(-0.557)			(0.038)
*SFERatio*Tradesecret2*			-0.355			0.020

Table 17 continued.

			(-0.233)			(0.189)
Post*SFERatio*Tradesecret1			**1.982**			**0.034**
			(0.868)			**(0.214)**
Post*SFERatio*Tradesecret2			**0.524**			**-0.087**
			(0.228)			**(-0.503)**
Constant	0.037	0.029	0.017	0.187***	0.078	0.073
	(0.063)	(0.019)	(0.011)	(9.280)	(0.807)	(0.753)
Observations	226,600	7,188	7,188	226,600	7,303	7,303
R-squared				0.042	0.056	0.054
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Pair Level Clustered	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.059	0.074	0.071			
Log pseudolikelihood	-66870	-2187	-2193			
Adjusted R-squared				0.042	0.048	0.046

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests. Robust z-statistics are in parentheses. Standard errors are clustered by pairs. *POST* in the table below does not show coefficients in columns (5) and (6) because *POST* is omitted because of collinearity with the fixed effects.

In columns (1) and (4), I report the results with the interaction terms, *Post * Tradesecret1 * SFE, Post * Tradesecret2 * SFE,* using a logit regression and an LPM, respectively. None of the three-way interaction terms, *Post * Tradesecret1 * SFE* and *Post * Tradesecret2 * SFE,* are significant at the 10% level.

Similarly, in columns (2) and (5), I report the results with the interaction terms, *Post * Tradesecret1 * SFENum, Post * Tradesecret2 * SFENum,* using a logit regression and an LPM, respectively. None of the three-way interaction terms, *Post * Tradesecret1 * SFENum* and *Post * Tradesecret2 * SFENum,* are significant at the 10% level. In columns (3) and (6), I report the results with the interaction terms, *Post * Tradesecret1 * SFERatio, Post * Tradesecret2 * SFERatio,* using a logit regression and an LPM, respectively. None of the three-way interaction terms, *Post * Tradesecret1 * SFERatio* and *Post * Tradesecret2 * SFERatio,* are significant at the 10% level.

Overall, the results show same-industry rivals with supervisory financial expertise on the AC does not show any impact on the company's preference over the audit office sharing after the headquarter state adopts the IDD, when the costs of information leakage increase.

CHAPTER 8
CONCLUSIONS

This study contributes to the auditing literature by identifying and quantifying the causal effect of proprietary costs on companies' auditor sharing decisions. I exploit the impact of the staggered adoption of the IDD across the US states on companies' choice over audit office sharing. Because IDD adoption exogenously increases the cost of proprietary information disclosure through lower employee mobility, companies with trade secrets react to such shock by reducing audit office sharing. The empirical results are robust in the national-, state-, and CBSA-level auditor sharing. The results are robust after I exclude those observations affected by auditors' mergers and acquisitions and the Sarbanes-Oxley Act of 2002. The results are consistent with my main findings when I differentiate the adoption of the IDD from the rejection of the IDD.

Using cross-sectional analyses, I further find that peer companies with trade secrets increase their Big N audit office sharing after the companies headquarter state adopts the IDD. This evidence implies that more companies choose to share Big N audit office after the companies' home state adopts the IDD to alleviate their concerns of proprietary information leakage to other peer companies. The Big N auditors' brand reputation, intention to avoid potential litigation risk exposure, and deep pockets may explain that companies trust Big N auditors when costs of information leakage go up. I also find that peer companies with industry experts and accounting financial experts in the AC become more likely to share an audit office after the headquarter state adopts the IDD, when the costs of information leakage increase. In contrast, peer companies with supervisory financial experts on the AC do not seem to affect companies' preference over auditor sharing after the IDD adoption. The results suggest that

companies with industry experts and accounting financial experts on the audit committees are more likely to share audit office to benefit from auditor sharing after the headquarter state adopts the IDD. These companies are less concerns about the potential information leakage because their experts on the audit committees have better knowledge and expertise to only providing relevant industry and financial accounting information to the external auditors without sacrificing the companies' proprietary information.

To the best of my knowledge, this study is the first to provide large sample empirical evidence over the causal effect of concerns about information leakage on companies' auditor sharing choice decisions in US states. It extends previous research on managers' concerns of potential proprietary information leakage, a much less investigated cost side of the auditor sharing compared with its benefits from industry specialization. Such concerns are either implied in anecdotal evidence or studied using data from one state (Aobdia 2015; Png and Salida 2015). My findings suggest an unintended effect of better trade secrets protection on companies' auditor sharing choice.

A caveat of my study is that IDD adoption affects the costs of proprietary information disclosure indirectly because the direct costs of proprietary information disclosure are not observable. Nevertheless, my study provides meaningful empirical evidence about whether companies are concerned about auditor sharing when the costs of proprietary information disclosure increase. My study also suggests that IDD adoption might alleviate companies with concerns of trade secrets leakage. These companies may choose to share Big N audit office with peer companies. Companies with certain experts on the audit committee are also less concerned about the proprietary information loss to its peer companies.

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APPENDIX A

VARIABLE DEFINITIONS

Dependable Variable:

Audit Office Sharing	1 if two peer companies in the pairs with the same NAICS, in the same year and state, hire the same audit office, and 0 otherwise.

Variables of Interest:

Post	1 if the observation is in the year after the state adopts the IDD, and 0 otherwise.
Tradesecret1	1 if only one of the two matching companies has trade secrets, and 0 otherwise. Complete trade secret data is from 1997 to 2017 provided by Dr. Glaeser.
Tradesecret2	1 if the two matching rival companies both have trade secrets, and 0 otherwise. Complete trade secret data is from 1997 to 2017 provided by Dr. Glaeser.

Other Variables:

Δ*Sale*	absolute value of the difference in the revenues of the two companies composing the pair, normalized by the sum of their revenues.
IndSale	logarithm of the six-digit NAICS code industry sales.
Herfindahl	industry Herfindahl index computed at the six-digit NAICS code.
Margin	industry aggregate sales divided by the industry aggregate operating costs.
Capex	logarithm of the weighted average capital expenditures in the industry, weighted by each company's market shares defined by sales.
Age	average age of companies within a given industry with age calculated from the first day the company becomes available in Compustat.
Adopt	1 when the peer companies' headquarter state adopts the IDD but do not reject the IDD in that year, and 0 otherwise.
Reject	1 when the peer companies' headquarter state rejects the IDD, and 0 otherwise.
IndExp	1 if either of the peered companies have at least one industry experts on the audit committees, and 0 otherwise. I follow Cohen et al. (2014) to identify whether an audit committee has industry experts. Of an audit committee member has been employed by companies that have the same two-digit SIC code of the company, this member is considered as an audit committee industry expert.
IndExpNum	average number of industry experts on the audit committees of the two peered companies. It measures the strength of the AC industry expertise.

AFE	1 if either of the peered companies have at least one Accounting Financial Experts (AFE) on the audit committees, and 0 otherwise. I follow Cohen et al. (2014) to identify whether an audit committee has AFE. An audit committee member is an accounting financial expert if his/her previous biography shows that he/she has at least one of the following qualifications: certified public accountant, chief financial officer, auditor, chief accounting officer, controller, treasurer, or vice president-finance. The data are from BoardEx and Compustat.
AFENum	average number of AFEs on the audit committees of two peer companies. It measures the strength of the AC AFE.
AFERatio	average ratio of AFEs on the audit committees of two peer companies. It measures the strength of the AC AFE.
SFE	1 if either of the peered companies have at least one Supervisory Financial Experts (SFE) on the audit committees, and 0 otherwise. I follow Cohen et al. (2014) to identify whether an audit committee has SFE. Audit committee members who are supervisory financial experts, but are not industry experts, where an audit committee member is a supervisory financial expert if his/her biography indicates that he/she has at least one of the following qualifications: chief executive officer, chief operating officer, chairman of the board, or a president of a company and is not an accounting financial expert. The data are from BoardEx and Compustat.
SFENum	average number of SFEs on the audit committees of two peer companies. It measures the strength of the AC SFE.
SFERatio	average ratio of SFEs on the audit committees of two peer companies. It measures the strength of the AC SFE.

APPENDIX B

PRECEDENT-SETTING LEGAL CASES ADOPTING OR REJECTING THE INEVITABLE DISCLOSURE DOCTRINE

This appendix is a replication of Table 1 in Klasa et al. (2018) and Appendix B in Li et al. (2018).

State	Precedent-Setting Cases	Date	Decision
AR	Southwestern Energy Co. v. Eickenhorst, 955 F. Supp. 1078 (W.D. Ark. 1997)	3/18/1997	Adopt
CT	Branson Ultrasonics Corp. v. Stratman, 921 F. Supp. 909 (D. Conn. 1996)	2/28/1996	Adopt
DE	E.I. duPont de Nemours & Co. v. American Potash & Chem. Corp., 200 A.2d 428 (Del. Ch. 1964)	5/5/1964	Adopt
FL	Fountain v. Hudson Cush-N-Foam Corp., 122 So. 2d 232 (Fla. Dist. Ct. App. 1960)	7/11/1960	Adopt
FL	Del Monte Fresh Produce Co. v. Dole Food Co. Inc., 148 F. Supp. 2d 1326 (S.D. Fla. 2001)	5/21/2001	Reject
GA	Essex Group Inc. v. Southwire Co., 501 S.E.2d 501 (Ga. 1998)	6/29/1998	Adopt
IL	Teradyne Inc. v. Clear Communications Corp., 707 F. Supp. 353 (N.D. 111. 1989)	2/9/1989	Adopt
IN	Ackerman v. Kimball Int'l Inc., 652 N.E.2d 507 (Ind. 1995)	7/12/1995	Adopt
IA	Uncle B's Bakery v. O'Rourke, 920 F. Supp. 1405 (N.D. Iowa1996)	4/1/1996	Adopt
KS	Bradbury Co. v. Teissier-duCros, 413 F. Supp. 2d 1203 (D. Kan. 2006)	2/2/2006	Adopt
MA	Bard v. Intoccia, 1994 U.S. Dist. LEXIS 15368 (D. Mass. 1994)	10/13/1994	Adopt
MI	Allis-Chalmers Manuf. Co. v. Continental Aviation & Eng. Corp., 255 F. Supp. 645 (E.D. Mich. 1966)	2/17/1966	Adopt
MI	CMI Int'l, Inc. v. Intermet Int'l Corp., 649 N.W.2d 808 (Mich. Ct. App. 2002)	4/30/2002	Reject
MN	Surgidev Corp. v. Eye Technology Inc., 648 F. Supp. 661 (D. Minn. 1986)	10/10/1986	Adopt
MO	H&R Block Eastern Tax Servs. Inc. v. Enchura, 122 F. Supp. 2d 1067 (W.D. Mo. 2000)	11/2/2000	Adopt
NJ	Nat'l Starch & Chem. Corp. v. Parker Chem. Corp., 530 A.2d 31 (N.J. Super. Ct. 1987)	4/27/1987	Adopt
NY	Eastman Kodak Co. v. Powers Film Prod., 189 A.D. 556 (N.Y.A.D. 1919)	12/5/1919	Adopt
NC	Travenol Laboratories Inc. v. Turner, 228 S.E.2d 478 (N.C. Ct. App. 1976)	6/17/1976	Adopt
OH	Procter & Gamble Co. v. Stoneham, 747 N.E.2d 268 (Ohio Ct. App. 2000)	9/29/2000	Adopt
PA	Air Products & Chemical Inc. v. Johnson, 442 A.2d 1114 (Pa. Super. Ct. 1982)	2/19/1982	Adopt
TX	Rugen v. Interactive Business Systems Inc., 864 S.W.2d 548 (Tex. App. 1993)	5/28/1993	Adopt
TX	Cardinal Health Staffing Network Inc. v. Bowen, 106 S.W.3d 230 (Tex. App. 2003)	4/3/2003	Reject
UT	Novell Inc. v. Timpanogos Research Group Inc., 46 U.S.P.Q.2d 1197 (Utah D.C. 1998)	1/30/1998	Adopt
WA	Solutec Corp. Inc. v. Agnew, 88 Wash. App. 1067 (Wash. Ct. App. 1997)	12/30/1997	Adopt