The Effect of Trade Secrets Law on Stock Price Synchronicity: Evidence from the Inevitable Disclosure Doctrine

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ABSTRACT: We exploit the staggered recognition of the Inevitable Disclosure Doctrine (IDD) by US state courts to examine the effect of trade-secret protection on the amount of firm-specific information incorporated in stock prices, as reflected in stock price synchronicity. We find that after certain state courts recognize the IDD, firms headquartered in those states exhibit a significant increase in stock price synchronicity relative to firms in other states. We also find a significant decrease in the disclosure of proprietary information in the firms' 10-K reports. These results suggest that IDD recognition increases the proprietary cost of disclosure, and, in response, corporate managers withhold more information. In addition, we find that the increase in stock price synchronicity and the decrease in the disclosure of proprietary information lead to increases in the firm's market share, cost of equity, and market-to-book ratio, suggesting that managers sacrifice capital market benefits for product market gains.

Keywords: Trade secret law, Inevitable Disclosure Doctrine, stock price synchronicity, proprietary cost of disclosure, information environment

Data Availability: Data used in this study are available from public sources identified in the study.

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I INTRODUCTION

In today's economies, outperforming rivals increasingly depends on firms' ability to develop and maintain proprietary knowledge (Grant 1996; Castellaneta, Conti, and Kacperczyk 2017). Firms can safeguard their proprietary knowledge by either filing patents or keeping it as trade secrets. Patents protect technical innovations for a fixed period of time and require disclosure of certain details about the knowledge resource. Trade secrets have a much broader scope, do not require disclosure, and can be unlimited in time. According to the Restatement (Third) of Unfair Competition (1995: 39), a trade secret is defined as "any information that can be used in the operation of a business or other enterprise and is sufficiently valuable and secret to afford an actual or potential economic advantage over others." Examples of trade secrets include customer lists, business plans, formulas, processes, research and development (R&D) data, and product designs.

In the US, trade secrets are protected by state-level statutes and case laws. While the Uniform Trade Secret Act (UTSA) establishes the uniform definition and protection of trade secrets, the Inevitable Disclosure Doctrine (IDD) is a common law principle that prevents a firm's employee who has knowledge of the firm's trade secrets from working for its rivals. In states where the courts have recognized the IDD, a firm's former workers can be prevented from working for its competitors if this would "inevitably" lead them to divulge the firm's trade secrets to the competitors. The IDD is considered a powerful legal tool in protecting trade secrets because, in theory, the IDD is applicable even if the employee does not sign a non-compete or non-disclosure agreement with the firm, there is no evidence of bad faith or actual wrongdoing, or the rival is located in another state (Klasa et al. 2018). Considering that the IDD has a profound effect on product market competition and product market competition influences disclosure incentives (Verrecchia 1983; Darrough and Stoughton 1990; Hayes and Lundholm 1996), we examine the

effect of state courts' IDD recognition on the amount of firm-specific information incorporated in stock prices.

Corporate managers trade off the benefits and costs in choosing the level of proprietary information to disclose to the capital market. The disclosure of proprietary information reduces information asymmetry between managers and capital market participants, resulting in improved stock prices, lower cost of capital, and higher stock liquidity (e.g., Diamond and Verrecchia 1991; Kim and Verrecchia 1994; Easley and O'Hara 2004; Lambert, Leuz, and Verrecchia 2007). Full disclosure, however, is rarely observed. An important constraint of full disclosure is proprietary cost: The proprietary information revealed through public disclosure can also be observed and exploited by product market rivals to the disclosing firm's disadvantage, which damages the firm's competitive position in the product market (Verrecchia 1983; Darrough and Stoughton 1990; Wagenhofer 1990; Hayes and Lundholm 1996).

For disclosures to bear a proprietary cost, the information revealed through the disclosures must be unknown to the firms' product market rivals. Prior to states' recognition of the IDD, competitors could obtain proprietary information by directly hiring firms' former employees who have access to the information. Thus, it is less costly for firms to disclose such information publicly for capital market benefits. As the IDD lowers employee mobility and constrains competitors' ability to obtain proprietary information by scoping from former employees, however, rival firms will rely more on a firm's public disclosure to glean proprietary information, and, in turn, firms have more proprietary information to safeguard from their rivals. In other words, the proprietary cost of public disclosure increases. The new equilibrium resulting from the increases in disclosure costs will lower the firm's optimal level of proprietary information disclosure after states' IDD recognition.

The amount of proprietary information included in public disclosures varies across

different types of disclosures. It is much more difficult to infer proprietary information from disclosures of aggregated financial information than from disclosures of key customers' identities or new contract details. To that end, we consider the former as nonproprietary information disclosures and the latter as proprietary information disclosures. Managers determine the optimal levels of proprietary and nonproprietary information disclosures to cater to investors' information demand and gain capital market benefits. While states' recognition of the IDD reduces firms' incentive to disclose proprietary information, firms may compensate for the loss of firm-specific information by increasing their disclosure of nonproprietary information. Although recognition of the IDD does not change the costs of nonproprietary information disclosure, it increases its marginal benefits, because a decrease in proprietary information disclosures makes nonproprietary information more valuable to capital market participants. Thus, managers may supply more nonproprietary information disclosures to capital market participants after the recognition of the IDD.

As recognition of the IDD potentially has different effects on the disclosures of proprietary and nonproprietary information, we focus on stock price synchronicity to examine the net effect of the IDD on the production of firm-specific information. Prior studies argue that price synchronicity is a good summary measure of firm-specific information inflow and interpret higher stock price synchronicity (lower stock price idiosyncratic volatility) as the result of a smaller amount of firm-specific information being incorporated in stock prices (e.g., Morck, Yeung, and Yu 2000; Jin and Myers 2006; Ferreira and Laux 2007; Hutton, Marcus, and Tehranian 2009). To examine the effect of the IDD on stock price synchronicity, we follow Bertrand and Mullainathan's (2003) approach and use a difference-in-differences (DiD) design based on the staggered recognition of the IDD by US state courts. We find a significant increase in price synchronicity for firms headquartered in states

that recognize the IDD after its recognition, relative to firms headquartered in other states. This finding is consistent with a net decrease in the total amount of firm-specific information incorporated in stock prices. We also examine the effect of the IDD on disclosures of proprietary information, measured by disclosure of R&D activities and redaction of confidential information in 10-K filings. We find a significant decrease in disclosures of R&D activities and a significant increase in the redaction of confidential information in 10-K reports for firms headquartered in states that recognize the IDD after its recognition, relative to firms headquartered in other states. This result supports the argument that the IDD reduces disclosures of proprietary information.

In additional analyses, we find a significant increase in the issuance of management forecasts and 10-K length for firms headquartered in states that recognize the IDD, relative to firms headquartered in other states, which is consistent with our conjecture that as the recognition of the IDD decreases the disclosure of proprietary information, firms increase the disclosure of nonproprietary information to cater to investors' information demand. Despite the positive effect of IDD recognition on the disclosure of nonproprietary information, the increase in stock price synchronicity suggests that overall firm-specific information production decreases subsequent to IDD recognition.

When firms reduce the disclosure of proprietary information, they sacrifice capital market benefits for product market benefits. Therefore, in additional analyses, we further examine the consequence of withholding proprietary information on product and capital market benefits/costs. We find that the increase in stock price synchronicity and the reduction in proprietary information disclosure arising from IDD recognition lead to greater market share, higher cost of equity, and higher firm market value. These results suggest that managers reduce the disclosure of proprietary information for greater product market benefits at the expense of capital market benefits. Also, the increase in product market benefits outweighs the decrease in capital market benefits, resulting in

a net increase in firm market value.

Our study makes important contributions to the literature. First, our study contributes to the disclosure literature and joins a few other recent studies to add evidence on the proprietary cost of disclosures using the settings of trade-secret protection (Aobdia 2018; Glaeser 2018; Li, Lin, and Zhang 2018). Different from these studies, however, we further clarify the trade-off between product market benefits and capital market costs of reduced disclosure by showing the real effects of changes in disclosure resulting from states' IDD recognition (i.e., increases in market share, cost of equity, and firm market value). As such, our paper provides a more complete picture as to why firms change their disclosure after the IDD the way they do.

Second, our study contributes to the literature by examining the effects of trade-secret protections on firms' overall information environment. Concurrent papers, such as Lin, Wei, and Wu (2016) and Dhaliwal, Li, and Li (2017), find that disclosure of forward-looking information increases after IDD recognition, whereas Li, Lin, and Zhang (2018) find that states' recognition of the IDD reduces firms' disclosure of their key customer identities. Aobdia (2018) provides evidence that conflicts with the results in Lin et al. (2016) and Dhaliwal et al. (2017) by showing a negative relation between non-compete enforceability and corporate voluntary disclosure. We contend that the effect of the IDD on disclosure varies depending on the type of information conveyed through disclosures. Using stock price synchronicity as a summary measure of information inflow (Ferreira and Laux 2007), we provide novel evidence on the net effect of the IDD on the overall production of firm-specific information. We also provide evidence that is consistent with the IDD decreasing the disclosure of proprietary information and increasing the disclosure of nonproprietary information. Collectively, our evidence helps reconcile the seemingly

conflicting findings in the literature that examines the relation between trade-secret protection and the corporate information environment.

Lower stock price synchronicity reflects more firm-specific information incorporated in stock prices, which enables investors to make better financial decisions and to allocate capital more efficiently (Wurgler 2000; Durnev et al. 2003; Chen, Goldstein, and Jiang 2006). Thus, the positive relation between the IDD and stock price synchronicity suggests an unintended adverse consequence of the IDD: a decrease in firm-specific information production in the capital market.[1] As such, our evidence should be relevant to investors, managers, and legal authorities for their decision-making, as well as to researchers and policymakers to evaluate the effect of states' IDD recognition in a more holistic way.

Our paper is closely related to Aobdia (2018), which examines the effect of the enforcement level of non-compete agreements at the state level on corporate disclosure. Both our study and Aobdia (2018) examine the effect of trade-secret protection on the proprietary cost of disclosure. There exist important differences, however, in the setting, identification strategy, and proxies for the information environment; thus, the two studies complement each other. While Aobdia (2018) focuses on the enforceability of non-compete agreements as a measure of trade-secret protection, we examine the staggered state recognitions of the IDD, which enable us to employ a generalized DiD design to identify the causal effect of trade-secret protection on the firms' information environment and disclosure strategy. In addition, unlike Aobdia (2018), we recognize the possibility that recognition of the IDD affects disclosures of proprietary information and nonproprietary information differently and evaluate

[1] Other adverse effects of the IDD include its negative effect on innovation outcomes, as documented in Contigiani, Hsu, and Barankay (2018).

the changes in the overall information environment using stock price synchronicity. Our study also provides new insights about the effect of trade-secret protection on the information environment and the real consequences of a decrease in proprietary information disclosures resulting from IDD recognitions. We explore the product and capital market consequence of withholding proprietary information by examining changes in the market share and the cost of equity capital. We also examine changes in the firm's market value to estimate the net effect of withholding proprietary information.

Two recent studies utilize the change in trade-secret protection as an exogenous shock that affects managers' labor market mobility to examine how managers' career concerns affect their reporting choices in terms of bad news holding (Ali, Li, and Zhang 2018) and earnings management (Chen, Zhang, and Zhou 2018). Different from these two studies, which examine a specific property of a firm's disclosure and attribute the results to managers' career concerns, we study the effect of the IDD from the perspective of the proprietary cost of disclosure and examine the overall information environment.[2] In this sense, our paper complements these two studies by using price synchronicity as a comprehensive measure of information production and showing the net effect of the IDD on the overall production of firm-specific information.

The rest of the paper is organized in the following way. We discuss the background and the extant literature of the IDD and develop our hypothesis in Section II. The research design is elaborated in Section III. Section IV reports the empirical results, and Section V presents the results of additional analyses. Section VI concludes the paper.

[2] We show that firms decrease their discussions of R&D activities and increase the redaction of material information in 10-K filings. These results cannot be inferred from Ali et al. (2018), because R&D activities and redacted information are unlikely to be bad news. Furthermore, if the IDD increases managers' career concerns, it is plausible that good news disclosure increases while bad news disclosure decreases, leaving the net effect on firms' overall information environment unclear.

II BACKGROUND, LITERATURE, AND HYPOTHESIS DEVELOPMENT

Trade-secret protection and the IDD

According to the 1979 UTSA, a trade secret is defined as any information that derives independent economic value from not being generally known and that is subject to reasonable efforts to preserve secrecy. Examples of trade secrets can range from high-tech information, such as formulas, methods, software, and techniques, to relatively low-tech information, including business plans, designs, and details about customers and suppliers. Unlike most subjects of intellectual property law, which are governed by federal statutes, trade secrets are governed by state-level statutes and case laws, and there is a wide variation across state courts in their treatment of cases involving trade secrets (Klasa et al. 2018). In 1979, the National Conference of Commissioners approved the UTSA for enactment in all states. Since then, the majority of states in the US have adopted a version of the UTSA. Under the UTSA, any improper disclosure or use of a trade secret to the detriment of its owner constitutes misappropriation.

While the UTSA establishes a uniform definition and protection of trade secrets, the IDD is a common law theory arising from the concept of threatened misappropriation, the recognition of which is based on the precedent set by court decisions in previous cases.[3] This concept of "threatened misappropriation" does not immediately follow from the general principles in the UTSA, though its Section 2 mentions that the court is allowed to provide injunctive relief for actual or threatened misappropriation of trade secrets. If a state court recognizes the IDD, firms

[3] We note that the recognition of the IDD by a state court and the passage of the UTSA in the same state are different legal events. Several state courts recognized the IDD before the state adopted the UTSA, and some never adopted the UTSA. Conversely, several states adopted the UTSA, but their courts did not recognize the IDD. For example, California adopted the UTSA but does not recognize the IDD. We control for the passage of the UTSA in different states in an additional test.

headquartered in the state can use the doctrine to obtain temporary injunctive relief to prevent its current/former employees who possess valuable know-how from working for their competitors.[4] The IDD does not require the plaintiff firm to provide evidence on the actual misappropriation of the trade secret; rather, it only needs to demonstrate that the employee would "inevitably" disclose the trade secret when performing an equivalent job for a competitor. In fact, misappropriation of trade secrets is considered inevitable when an employee with knowledge of a firm's trade secrets accepts an equivalent position with a rival (Li et al. 2018).

Overall, by restricting employees' mobility, the IDD substantially enhances the protection of trade secrets. Many employment contracts contain a non-disclosure agreement (NDA) and/or a covenant not to compete (CNC). The IDD increases the enforceability of existing NDAs and CNCs, as it allows the firm to preempt violations of the NDA before they occur, which is important, because it is time-consuming and difficult to detect and prove actual NDA violations (Klasa et al. 2018). The IDD also protects a firm's trade secrets when some employees with access to these secrets wish to set up a new company in direct competition with its operations. In addition, the IDD applies even when NDAs or CNCs do not exist. Furthermore, unlike non-compete agreements, the IDD does not require a specific contract signed by employees, which is subject to an endogeneity concern for studies that examine the effects of trade-secret protection. Also, non-compete agreements are rarely enforceable when firms' rivals operate in different states because enforcement of non-compete agreements is usually limited to a specific geographic area (Kahnke, Bundy, and Liebman 2008). In contrast, the IDD applies even if the employee moves to a rival

[4] The applicability of the IDD is typically determined by the state where the employee works, not the firm's state of incorporation or where the headquarters are located, but data restrictions allow us to identify only the state of the firm's headquarters. Since only the employment location of workers with access to trade secrets should matter, following prior work (e.g., Klasa et al. 2018), we assume that most workers who have access to a firm's trade secrets work in the state of the firm's headquarters, which allows us to examine the effect of the IDD for firms headquartered in the state.

firm located in another state. Thus, the focus on the IDD allows us to consider out-of-state rivals as well as in-state rivals. In summary, we argue that the staggered recognition of the IDD in US state courts provides a powerful setting to test the effect of trade-secret protection on the production of firm-specific information.

Proprietary costs and disclosure

Disclosure theories suggest that voluntary disclosure mitigates information asymmetry between insiders and outside investors (Ajinkya and Gift 1984; Coller and Yohn 1997; Verrecchia 2001), resulting in improved stock liquidity and reduced cost of capital (Diamond and Verrecchia 1991; Leuz and Verrecchia 2000) and facilitating the monitoring of managerial efforts (e.g., Gjesdal 1981; Beyer et al. 2010). Absent any costs, value-maximizing managers have incentives to fully disclose their private information, because otherwise, investors will price-protect themselves (e.g., Wurgler 2000). Full disclosure, however, is rarely observed in the capital market.[5] One of the most important constraints or costs of full disclosure is the proprietary cost, referring to the cost associated with the disclosure of proprietary information that may jeopardize a firm's competitive position in the product market.[6] Verrecchia (1983) shows that in the presence of proprietary cost, partial disclosure can be optimal and that the level of disclosure decreases in the proprietary cost of disclosure. The survey evidence of Graham, Harvey, and Rajgopal (2005) suggests that managers consider the revelation of proprietary information an important impediment to disclosures.

[5] The other explanation to break the full disclosure equilibrium is when investors are uncertain about managers' private information endowment (Jung and Kwon 1988). When managers do not disclose, it might be because they do not have the information to disclose. One implication of this theory is that when managers are less certain about their business, they disclose less (Chen, Matsumoto, and Rajgopal 2011).

[6] Theory recognizes that both voluntary disclosure and mandatory disclosure can divulge proprietary information to competitors (Dye 1986).

Empirical findings on the association between proprietary cost and disclosures are somewhat mixed (Beyer et al. 2010). Prior research either uses product market competition to proxy for proprietary cost (e.g., Li 2010) or looks at specific forms of disclosure, such as segment reporting (Hayes and Lundholm 1996; Botosan and Stanford 2005), redaction of material contracts (Verrecchia and Weber 2006), and disclosure of major customers (Ellis, Fee, and Thomas 2012). Beyer et al. (2010) attribute the mixed results to difficulties in measuring and quantifying proprietary cost and call for more research in this area.

Hypothesis Development

The state courts' recognition of the IDD makes it more difficult for employees who possess trade secrets to move to a rival firm or start their own business, constraining the transfer of trade secrets through employee movements. The stronger legal protection of trade secrets can cause an increase in the proprietary costs of disclosures and result in a decrease in the disclosure of proprietary information due to two related reasons. First, the decrease in proprietary information leakage through employee mobility increases the chance that public disclosure could contain confidential information that is valuable to firms' rivals and/or that rival firms would rely more heavily on a firm's public disclosures to extract its proprietary information, thereby increasing the benefits of non-disclosure or the proprietary costs of disclosure. Second, once proprietary information is disclosed, it is no longer protected by any trade secrets law, including the IDD. Therefore, to take advantage of the stronger legal protection offered by the IDD, firms will reduce the amount of proprietary information released publicly (Li et al. 2018).

Overall, the recognition of the IDD increases the benefits of not disclosing proprietary information or the costs of disclosing proprietary information. Thus, we expect the optimal level

of proprietary information disclosure to decrease for firms located in states that recognize the IDD. Appendix A provides examples of proprietary information disclosure before and after IDD recognition. These examples show that firms are more likely to withhold proprietary information after IDD recognition than before IDD recognition.

While disclosures of key customer identities and new product details reveal proprietary information to product market rivals, disclosures of aggregate financial information, such as management forecasts, are less likely to contain proprietary information. In the capital market, investors demand information for valuation purposes. Managers determine the optimal level of proprietary and nonproprietary information disclosures to cater to investors' information demand and gain capital market benefits.[7] While recognition of the IDD does not affect the costs of providing nonproprietary information disclosure, it indirectly increases the marginal benefits of disclosing nonproprietary information to capital market participants. For example, when firms in states that recognize the IDD conceal information about material contracts and new product development, capital market participants, such as investors and analysts, will find it more difficult to predict firms' future performance. Analysts may want more guidance from managers to project future earnings without much information about operating activities, such as new contracts and product development schedules. In response, managers can provide earnings guidance. Product market rivals will find it much more difficult to infer proprietary information from earnings guidance than from disclosures about new contracts and new product developments.

[7] While the disclosure of nonproprietary information bears little proprietary cost, there are other costs associated with providing nonproprietary information such as aggregated financial data. For example, managers run the risk of not meeting or beating their own forecasts when they issue management forecasts to guide market participants. In addition, litigation risk may increase if the forecast is proven to be inaccurate. Firms may also have to spend substantial resources to generate and aggregate information to be disclosed to market participants.

As the IDD has different effects on the disclosures of proprietary information and nonproprietary information, it is necessary to examine the net effect of the IDD on firms' overall information environment using a comprehensive measure, such as price synchronicity. Proprietary information is by nature firm-specific and cannot be easily replaced by private information discovery. Therefore, the reduction of proprietary information disclosure subsequent to states' recognition of the IDD could lead to less firm-specific information being incorporated in stock prices, resulting in greater stock price synchronicity.

The disclosure of nonproprietary information may increase following states' recognition of the IDD (Lin et al. 2016; Dhaliwal et al. 2017). Nonproprietary information could be firm-specific, or industry and market-specific, however, and could also be searched privately by investors. Therefore, the increase in nonproprietary information disclosure may not be able to fully compensate for the loss in firm-specific information as a result of the reduction in proprietary information disclosures. Nevertheless, we propose that the net effect of the IDD on stock price synchronicity is an empirical question and develop our hypothesis in a null form as follows:

H1: Following the recognition of the IDD in a state court, firms headquartered in the state do not experience any change in their stock price synchronicity.

III RESEARCH DESIGN

Measure of Price Synchronicity

We follow the literature to measure stock price synchronicity (e.g., Morck, Yeung, and Yu 2000; Chan and Hameed 2006). For each firm in each year, we regress weekly firm stock returns on current and lagged market and industry value-weighted returns as follows:

$$Ret_{i,m} = \delta_0 + \delta_1 MKT\_ret_m + \delta_2 MKT\_ret_{m-1} + \delta_3 IND\_ret_{k,m}$$
$$+\delta_4 IND\_ret_{k,m-1} + \varepsilon_{i,m,} \quad (1)$$

where *i, k,* and *m* denote firm *i*, industry *k*, and week *m*, respectively. For each firm-year, we require at least 45 weekly observations to perform the regression. Stock price synchronicity, *Sync*, is computed as the logged transformed R^2 from estimating regression Equation (1):

$$Sync = \ln\left(\frac{R^2}{1-R^2}\right).$$

A larger (less negative) value of *Sync* implies a higher degree of co-movement of firm stock prices with market and industry prices, suggesting a lower degree of firm-specific information incorporated in the stock prices.

Measure of IDD Indicator

We obtain the year of IDD recognition in each state from Klasa et al. (2018). Klasa et al. (2018) start with state-by-state analyses of case law associated with trade secrets in legal research and identify the "precedent-setting case" in which a state court explicitly recognizes the applicability of the IDD in protecting trade secrets. Table 1 provides a list of states, along with the timing of IDD recognition. By 2010, a total of 21 states recognized the IDD, with the earliest recognition in New York (1919) and the latest in Kansas (2006). Out of the 21 IDD states, 10 recognized the IDD before the beginning of our sample period (1994), and the remaining 11 states recognized the IDD during our sample period. Three out of 10 states rejected the IDD during our sample period that they had previously recognized: Florida (rejected in 2001), Michigan (2002), and Texas (2003). Based on the states' IDD recognition, we construct the IDD indicator (IDD_t) as taking the value of 1 if the IDD is recognized in the firm's state of headquarters in a given year *t*,

and zero otherwise.

[Insert Table 1 here]

Difference-in-differences design

To examine whether state courts' recognition of the IDD affects corporate information production and stock price synchronicity, following Bertrand and Mullainathan's (2003) approach, we employ a generalized differences-in-differences (DiD) design by estimating the following regression:

$$Sync_{i,t} = \alpha_0 + \beta \ IDD_{j,t} + \gamma' X_{i,t} + f_i + \mu_t + \varepsilon_{i,t,} \quad (2)$$

where *i*, *j*, and *t* denote firm *i*, state *j*, and year *t*, respectively; *Sync* is stock price synchronicity, computed as described above; *IDD* is the IDD indicator as explained above, which takes the value of 1 if the IDD is recognized in the state during the year, and zero otherwise. If the enhanced protection of trade secrets due to IDD recognition increases (decreases) stock price synchronicity, the coefficient on *IDD* will be significantly positive (negative). Because the IDD indicator changes from 1 to 0 after its rejection in the three states that reject the IDD, the coefficient on the IDD indicator can be interpreted as the inverse IDD rejection effect for firms headquartered in those three rejection states. The firm indicators (f_i) control for time-invariant, unobservable firm characteristics that could potentially affect price synchronicity. The year indicators (μ_t) control for economy-wide factors that could affect the corporate information environment and the state's recognition of the IDD. With both firm- and year-fixed effects, the coefficient β in Equation (2) is a DiD estimator that captures the effects of IDD recognition (the adoption effect in 11 states that adopt the IDD during our sample period and the inverse IDD rejection effect in the three states that reject the IDD during our sample period).

The IDD effect in the three rejecting states (i.e., the inverse of the rejection effect), however, may not be as strong as the IDD effect in the other 11 adopting states (i.e., the adoption effect) for the following reasons. According to Marx, Strumsky, and Fleming (2009) and Chen et al. (2018), the three states (Texas, Florida, and Michigan) that rejected the IDD made various changes to their trade-secret protection laws, such as their non-compete enforcement policy, before their rejections of the IDD, which could weaken the effect of IDD rejections. For example, after recognizing the IDD in 1993, Texas reduced the enforceability of its non-compete agreements during 1995, before the IDD was rejected in 2003. Such a change may obfuscate the effect of IDD rejection. Michigan is a state that lacks definitive case law regarding the IDD (Wiesner 2012). In Leach v. Ford Motor Co., 299 F. Supp. 2d 763, 775 (E.D. Mich. 2004), for example, the court refused to apply the IDD when there was no evidence of "lack of Candor" or "proof of . . . willingness to misuse trade secrets," even though, in general, the IDD does not require evidence of bad faith or actual wrongdoing (Glaser and McMurray 2004). In addition, several courts in Michigan acknowledge that the doctrine is applicable only to high-level executives and key designers of the company's strategic plans and operations. In addition, Michigan and Florida passed the Unified Trade Secrets Act (UTSA) after the respective states' IDD recognition, meaning that the IDD had existed for a long period of time without a uniform trade-secret definition. Texas has never passed the UTSA. Overall, the IDD effect might be weaker in these three rejection states than in other states that adopt the IDD during our sample period. Considering this possibility, we modify Equation (2) to allow the IDD effects to be different between the rejecting states and the other adopting states. Specifically, we create an indicator *Rejection_State*, which takes the value of one for firms in the three states that eventually reject the IDD and zero for firms in other states, and then interact *Rejection_State* with *IDD*. We therefore estimate the following model.

$$Sync_{i,t} = \alpha_0 + \beta_1\ IDD_{j,t} + \beta_2\ IDD_{j,t} \times Rejection\_State_j + \gamma' X_{i,t} + f_i + \mu_t + s_j \times time\ \ trend_t + \varepsilon_{i,t,} \quad (3)$$

where for firms located in the three states that eventually reject the IDD, the IDD effect is captured by the sum of β_1 and β_2, whereas the IDD effect in the states that adopt the IDD during our sample period is captured by β_1. The main effect of *Rejection_State* is subsumed by firm-fixed effects.

X is a vector of control variables. We include a large number of control variables suggested by prior studies (e.g., Piotroski and Roulstone 2004; Gul, Kim, and Qiu 2010; Kim and Shi 2012). Stock price synchronicity is affected by the underlying economics of a firm and its industry, as well as the information production activities of its market participants (Piotroski and Roulstone 2004). To control for a firm's underlying economics, we include firm size (*Size*), market-to-book ratio (*MTB*), leverage (*Lev*), standard deviation of return on assets over the last five years (*SD_ROA*), total accruals (*Accruals*), corporate diversification (*FDiv*), and the correlation between a firm's earnings and industry-level earnings (*FundCorr*). We include the change in institutional investors' holdings over the year, divided by total share volume over the year (Δ*Inst*), and the total number of earnings forecasts and revisions made by analysts over the year (*NRev*) to control for the information production of the firm's institutions and analysts. Lastly, to control for the industry-level environment, we include the natural logarithm of the number of firms in an industry (*Ind_Size*) and the industry Herfindahl-Hirschman index, calculated using sales (*Ind_HH*). Variable definitions are provided in Appendix B.

We also control for state time trends to avoid erroneously attributing the effects of unknown time-varying state-level factors to the IDD. In all the regressions, we cluster standard errors at the state level, as Bertrand and Mullainathan (2003) suggest, because the variable of interest, *IDD*, is determined at the state level.

Sample Selection and Data

Our sample is limited to the 1994-2010 period, during which we can identify the historical locations of each firm's headquarters from Bill McDonald's database and recognition of the IDD across states from Klasa et al. (2018).[8] We merge historical headquarters data with data from Center for Research in Security Price (CRSP) data, Compustat, Thomson Reuters 13F, and the Institute Brokers Estimate System (IBES) to estimate stock price synchronicity and calculate the control variables in Equation (3). After dropping observations with missing data to construct the variables in Equation (3) and excluding firms in financial industries (i.e., SIC code 6000-6999), our final sample consists of 27,471 firm-year observations. We winsorize all continuous variables at the top and bottom 1% of the distribution.

IV EMPIRICAL RESULTS

Descriptive Statistics

Table 2 reports descriptive statistics. *Sync* is the measure of stock price synchronicity calculated based on R^2 estimated from Equation (1). The mean and median values of *Sync* are negative because R^2 is smaller than 50% for the majority of our sample firms. Since our sample is based on US firms, firm-specific information is abundant and the stock prices tend to co-move to a lesser extent with market-wide and/or industry-wide information, resulting in lower R^2 (Morck, Yeung, and Yu 2000). The mean value of *IDD* is 0.527, indicating that more than 50% of the firm years have the IDD recognized by the state court. We omit the discussion of other variables for

[8] The corporate 10-K header information extracted from the EDGAR system in usable format is available from http://www3.nd.edu/~mcdonald/10-K_Headers/10-K_Headers.html.

brevity.

[Insert Table 2 here]

IDD and stock price synchronicity

The results of estimating our DiD analyses to examine the effect of the IDD on stock price synchronicity are reported in Table 3. Column (1) reports the results controlling for firm- and year-fixed effects, but without any covariate, while column (2) reports the estimated results controlling for firm characteristics together with firm- and year-fixed effects. In both columns, the coefficients on *IDD* are positive and significant (0.102, t = 2.389 in column (1); 0.141, t = 3.421 in column (2)), suggesting that stock price synchronicity increases for firms headquartered in states that recognize the IDD subsequent to its recognition. In column (3), we replace firm-fixed effects with state- and industry-fixed effects, but still control for year-fixed effects and firm characteristics. We still find a positive and significant coefficient on *IDD* (0.165, t = 4.867). In column (4), we add a state-specific time trend to the model to control for the effect of unobservable state-level factors that change with the time trend. The effect of IDD recognition on stock price synchronicity remains significantly positive (0.095, t = 3.158). Such results are consistent with a net reduction in the amount of firm-specific information incorporated in stock prices after firms' headquarters states recognize the IDD during our sample period. The coefficient estimate of *IDD* in column (4) suggests that after recognition of the IDD, stock price synchronicity increases by about 0.095. This means that an average firm's stock price synchronicity moves from -1.337 (Table 2) to -1.242, which is equivalent to 20.8% and 22.4% of stock price changes being explained by industry and market returns, respectively. That is, the extent to which stock price changes are explained by industry and market returns increases by 7.7% (= 22.4% / 20.8% – 1) after IDD recognition, which

we believe is economically meaningful.[9]

Across all columns, the coefficients on *IDD*×*Rejection_State* are negative and statistically significant, suggesting that the IDD effects in the three rejection states (Florida, Michigan, and Texas) are different from those in the states that adopt the IDD during our sample period. In addition, the sum of the coefficients on *IDD* and *IDD*×*Rejection_State* is negative and statistically significant in columns (1) to (3). After controlling for the state-specific time-trend in column (4), however, the sum of the coefficients on *IDD* and *IDD*×*Rejection_State* becomes insignificant, suggesting that time-varying state-level factors may contribute to the significantly negative IDD effects in those three rejection states. Therefore, in all subsequent tables, we control for state-level time trends to avoid erroneously attributing the effects of unknown time-varying state-level factors to the IDD.

As for the control variables, the results are similar to those reported in prior studies (e.g., Piotroski and Roulstone 2004; Gul, Kim, and Qiu 2010). Larger firms (*Size*), firms with earnings more correlated with those of peers (*FundCorr*), and firms with more analyst activities (*NRev*) are associated with higher price synchronicity, while firms with higher leverage (*Lev*) and more concentrated segment sales (*FDiv*) have lower price synchronicity.

[Insert Table 3 here]

IDD and disclosure of proprietary information

The empirical evidence in Table 3 supports the argument that states' recognition of the IDD results in a decrease in the disclosure of proprietary information, which contributes to a decrease

[9] When $Sync = \ln\left(\frac{R^2}{1-R^2}\right) = -1.337$, $R^2 = 20.8\%$. When $Sync = \ln\left(\frac{R^2}{1-R^2}\right) = -1.242$, $R^2 = 22.4\%$.

in the overall production of firm-specific information. To lend further support to this argument, we directly examine the disclosure of proprietary information. From prior studies (Merkley 2014; Verrecchia and Weber 2006; Boone, Floros, and Johnson 2016), we identify two measures of proprietary information disclosure: R&D disclosure and redaction of confidential information in 10-Ks.

Investment in R&D expenditures is considered as a secret weapon to achieve innovation and success in today's business world. To stay ahead of their rivals along the technology curve, firms need to keep their R&D projects secret from their rivals. Snapchat, for example, chooses a remote location in Lehi, Utah, located 30 miles away from Salt Lake City, to build a secret R&D lab so that it can develop new app features and hardware devices beyond the scope of its competitors' prying eyes and ears.[10] As emphasized by a report from the World Intellectual Property Organization (WIPO), keeping trade secrets continues to be relevant during the entire R&D phase, because once competitors obtain such vital information, it will result in the erosion of a competitive advantage derived from the final product.[11] As Merkley (2014) argues, detailed information on R&D investments potentially benefits product market competitors, imposing proprietary costs on the disclosing firm. In addition, Koh and Reeb (2015) show that firms omit R&D expenditures in their reports to reduce the availability of proprietary information to competitors. Given these arguments, disclosures about a firm's R&D activities in its 10-K filings are likely to contain proprietary information that could impose significant harm on the firm's competitive position once exploited by its rivals. To capture the amount of R&D disclosure in firms' 10-K report, we use the SeekEdgar platform to extract and count R&D-related words in

[10] Please refer to https://techcrunch.com/2017/10/10/snapchat-research/.
[11] Please refer to https://www.wipo.int/sme/en/documents/ip_innovation_development_fulltext.html.

firms' 10-K filings, using the list of keywords in Merkley's (2014) Online Appendix A.[12] Because R&D activity is highly related to the nature of the firm's industry, we adjust the raw count of R&D-related keywords by the three-digit Standard Industrial Classification (SIC) industry median (*Adj_R&D_Count*) and use it as the first measure of proprietary information disclosure.

A few prior studies use redaction in Securities and Exchange Commission (SEC) filings as a measure of the withholding of proprietary information (e.g., Verrecchia and Weber 2006; Boone, Floros, and Johnson 2016). The SEC requires firms to disclose all material contracts or agreements in their SEC filings, because investors ought to be informed about such important information. At the same time, the SEC also allows firms to request that proprietary information contained within the contract be withheld by redacting the data, which is called a "Confidential Treatment Request (CTR)." If the request is granted, only the SEC can access the redacted data, and not investors or any other financial statement users. The SEC evaluates firms' CTRs on the basis of whether the disclosure of the requested information would lead to proprietary harm. Therefore, the redaction of 10-K filings is likely to capture the withholding of proprietary information. That is, the redaction of material information from SEC filings can serve as an inverse measure of the disclosure of proprietary information. Following Verrecchia and Weber (2006), we use the SeekEdgar platform to search the keywords "Confidential Request" and "Confidential Treatment" in firms' 10-K filings and use the number of mentions of "Confidential Request" and "Confidential Treatment" in a firm's 10-K as the second measure of proprietary information disclosure (*10K_Redaction*).

We estimate the effects of the IDD on the two measures of proprietary information disclosure while considering the differences in the IDD effects between the three rejection states

[12] The keywords include "research and development," "R&D," "product development," "research, development," "research, engineering, and development," and "research and product development."

and the states that adopt the IDD during our sample period, as in Equation (3), by including *IDD*×*Rejection_State* in the regressions. We include a set of control variables commonly used in disclosure studies, such as firm size (*Size*), market-to-book ratio (*MTB*), leverage (*Lev*), profitability (*ROA*), institutional ownership (*InstHold*), analyst coverage (*AnaCov*), and return volatility (*SD_Ret*). We also include firm- and year-fixed effects, as well as state-level time trends, as additional controls. Variable definitions are provided in Appendix B. The results are reported in Table 4.

[Insert Table 4 here]

We report the results for R&D disclosure in 10-K reports in columns (1) and (2), and those for 10-K redactions in columns (3) and (4). We report the results without controlling for firm characteristics in columns (1) and (3) and those that control for firm characteristics in columns (2) and (4). In both columns (1) and (2), we find negative and significant coefficients on *IDD* (-0.126, t = -2.666 in column (1); -0.122, t = -2.564 in column (2)), suggesting that following states' recognition of the IDD, firms significantly reduce their disclosures of R&D activities in 10-K reports. The coefficients on *IDD*, as reported in columns (3) and (4), are both positive and significant (0.440, t = 2.697 in column (3); 0.447, t = 2.716 in column (4)). The coefficient estimates suggest that recognition of the IDD significantly increases 10-K redaction (or decreases the disclosure of confidential information in 10-Ks).[13] Overall, the results are consistent with the argument that recognition of the IDD increases the cost of proprietary information disclosure, motivating managers to withhold proprietary information, which in turn reduces firm-specific information incorporated in stock prices (i.e., it increases stock price synchronicity).

[13] In the sample used for testing *10K_Redaction*, *10K_Redaction* has a mean of 0.801 and a median of 0. *Adj_R&D_Count* has a mean of 0.514 and a median of 0 in its sample.

The coefficients on *IDD×Rejection_State* are significantly negative in columns (3) and (4), suggesting that the IDD effects are significantly weaker in the three rejection states, compared to those in the states that recognize the IDD during our sample period, for increasing the redaction of material information in 10-K reports. In addition, the sum of the coefficients on *IDD* and *IDD×Rejection_State* is insignificant in all columns, suggesting that the IDD in the three states have insignificant effects on the disclosure of proprietary information. As discussed earlier, the weaker IDD effects in these states potentially result from other changes in trade-secret protection before the eventual rejection of the IDD.

Correlated omitted variables and parallel trends assumption

To address the concern that correlated omitted variables at the state level might drive the results, we regress the IDD status (1 if the IDD is in effect in the state-year, and 0 otherwise) in state courts on stock price synchronicity, as well as R&D disclosure and 10-K redaction, averaged at the state level, and state-level characteristics, such as GDP growth and employment rate. We take an average of stock price synchronicity, *Adj_R&D_Count*, and *10K_Redaction*, as well as the state-level characteristics, over the past three years. The results reported in Table 5 suggest that stock price synchronicity and measures of proprietary information disclosures aggregated at the state level do not have predictive power for the IDD status. This evidence supports that states' recognition of the IDD is unlikely to be driven by firms' pre-existing disclosure incentives.

[Insert Table 5 here]

To strengthen the causal inference, we expand our event window to capture the dynamics of the IDD effect. To this end, we replace the IDD indicator (*IDD*) in the regressions with variables that indicate firm-years one year prior to the recognition of the IDD ($Adopt_{-1}$), the year of the

recognition ($Adopt_0$), and one year ($Adopt_1$), two years ($Adopt_2$), three years ($Adopt_3$), and four years or more ($Adopt_{4+}$) after states' IDD recognition. Firm years more than one year prior to the recognition of the IDD serve as benchmark years. In this analysis, we drop firms located in the three rejection states (Florida, Michigan, and Texas), as we focus on the timing of the IDD effect taking place after its adoption. The results are reported in Table 6. Columns (1), (2), and (3) report the results with stock price synchronicity, R&D disclosure in 10-Ks, and 10-K redaction as the dependent variable, respectively. The results show that states' recognition of the IDD is not anticipated in the year prior to its actual recognition, as indicated by an insignificant coefficient on $Adopt_{-1}$ across all columns. Since the years more than one year prior to the recognition of the IDD serve as benchmark years, the insignificant coefficient on $Adopt_{-1}$ also suggests that there are no changes of the dependent variables in the one-year period prior to the recognition of the IDD compared to earlier years. The effect of the IDD starts to materialize in year 2 after IDD recognition for stock price synchronicity and 10-K redaction, while the effect on R&D disclosure in 10-Ks does not materialize until three years after IDD recognition. The IDD continues to have a significant effect on stock price synchronicity and 10-K redaction beyond the first three years after its adoption, suggesting that the IDD has a long-term influence on the information environment.[14]

[Insert Table 6 here]

In Table 5, we show that state courts' recognition of the IDD is unrelated to firms' pre-existing disclosure choices. In Table 6, we validate the parallel trend assumption by comparing year t-1 to all the years prior to IDD recognition. To further mitigate the concern that the pre-event trend might not be properly controlled for, we also conduct a matched sample analysis. In

[14] We also examine the dynamics of the IDD rejection effect in the three rejection states. We find some evidence that IDD rejections start reducing 10-K redaction from the third year after the rejections, but do not find any significant IDD rejection effects for stock price synchronicity or R&D disclosure in 10-Ks.

particular, we employ a one-to-one matching approach to match each firm in the states that recognize the IDD during our sample period with a control firm in non-recognizing states in the year prior to IDD recognition, based on industry and changes in price synchronicity (*Sync*) from year t-3 to year t-1.[15] After the matching, we keep one year before and five years after IDD recognition to re-estimate the regressions in Tables 3 and 4. For this analysis, we do not include firms in any of the early adopting states or the three rejection states.[16]

The results reported in Table 7 show that the IDD effects on stock price synchronicity, R&D disclosure in 10-Ks, and 10-K redaction remain significant, suggesting that our results are robust to a matched sample design that balances the sample on firms' information environment prior to IDD recognition.

[Insert Table 7 here]

Lastly, because the IDD applies to firms with business locations in the states that recognize the law, we use firms' state of incorporation in a falsification test. In untabulated results, we find that IDD recognition in firms' state of incorporation does not have any significant effect on price synchronicity or the disclosure of proprietary information. This falsification test provides further support that the headquarters states' recognition of the IDD affects disclosure incentives by constraining employee movement.

Controlling for the effect of other legal protections of trade secrets

Trade secrets are protected not only by the IDD but also by other trade secret laws and practices, such as the UTSA and enforcement of non-compete agreements. Legal scholars agree

[15] Matching based on industry, size, market-to-book ratio, and return on assets generates similar results.
[16] Since we exclude the three rejection states from matching and therefore from the analysis based on the matched sample, we do not have *IDD*×*Rejection_State* in the regressions.

that the IDD is more effective at protecting trade secrets than these other laws and practices. In states that recognize the IDD, the firm only needs to prove that it is inevitable for a former employee with knowledge of its trade secrets to misappropriate trade secrets when performing at his/her position with the competitor, which allows state courts to grant temporary injunctive relief to the plaintiff firm to prevent the employee from working for its competitor. In comparison, non-compete agreements demand that violations must be detected and proved before the firm can initiate legal action against a former employee. In addition, non-compete agreements entail specific geographic restrictions (that are more effective when workers seek to switch jobs within a state). UTSA passage is a legal event that has more to do with unifying the definitions of trade secrets and setting the same principle of state statutes. Nevertheless, the UTSA and the enforcement of non-compete agreements are also institutionalized efforts intended to protect trade secrets and may have a similar effect as the IDD on corporate disclosures. To ensure that our results are not driven by other trade laws and practices, we conduct a test after controlling for UTSA passages and the enforcement of non-compete agreements in our regressions.

The timings of UTSA passage are obtained from Png (2016, 2017), which provides the year of enactment in each state. The non-compete enforceability index is obtained from Ertimur et al. (2018). Ertimur et al. (2018) expand the non-compete enforceability index originally developed by Garmaise (2009) for the 1992-2004 period to cover the 1980-2013 period. The index, which assigns a value of one for each of the 12 dimensions of non-compete agreement enforcement if a state's enforcement is above a given threshold, ranges from 0 to 12.[17] Table 8 reports the results. We find that the effects of the IDD on stock price synchronicity as well as

[17] For details of the dimensions of non-compete agreement enforcement, please refer to Garmaise (2009) and Ertimur et al. (2018).

R&D disclosure in 10-Ks and 10-K redaction remain significant, even after controlling for the effect of the UTSA and the state-level enforceability index of non-compete agreements. The coefficients on the UTSA and the state-level enforceability index of non-compete agreements are all insignificant.

[Insert Table 8 here]

Multiple operating states

Firms may have operations across many states, thereby adding noise to the effect of IDD recognition at the headquarters state. To address this concern, we use the SeekEdgar platform to search firms' 10-K filings and identify the cities mentioned in their 10-K filings that are outside their headquarters states. We find that more than 83% of the firms in our sample mention at least one city outside their headquarters state. To reduce the noise arising from multiple operation states, we exclude from our sample firms that mention in their 10-Ks a large number of cities outside their headquarters states (firms in the top quartile of the distribution of the number of out-of-state cities mentioned or firms that mention at least four cities outside their headquarters states in their 10-Ks). As reported in Table 9, the results using this reduced sample are qualitatively the same as those reported in Tables 3 and 4.

[Insert Table 9 here]

V ADDITIONAL ANALYSES

IDD and disclosure of nonproprietary information

In this section, we provide evidence on the effect of the IDD on the disclosure of nonproprietary information, using the frequency of management forecasts on quarterly earnings

(*Ln(1+#_MF)*) and 10-K length (*Ln(#_Words)*).[18] *Ln(1+#_MF)* is the natural logarithm of one plus the number of management forecasts issued on quarterly earnings in a given year. We consider information disclosed by short-term management earnings forecasts as largely nonproprietary, because merely mentioning managers' expectations about aggregated financial performance in the near term does not reveal much about trade secrets to a firm's competitors. *Ln(#_Words)* is the natural logarithm of the number of words in the 10-K reports. Most of the qualitative information in 10-K reports is provided to explain reported numbers.[19] For these tests, we include the same set of control variables as those in Table 4. The results are reported in Table 10.

In column (1), we find that the recognition of the IDD increases the frequency of management forecasts on quarterly earnings. In column (2), the positive and significant coefficient on *IDD* suggests that the IDD increases the number of words in 10-K filings. Overall, the results suggest that the IDD could drive firms to increase the disclosure of nonproprietary information. Combined with the results reported in Table 4 regarding the disclosure of proprietary information, the results in Table 10 seem to suggest that following states' recognition of the IDD, firms decrease their disclosure of proprietary information, but increase their disclosure of nonproprietary information. An examination of stock price synchronicity allows an evaluation of the effect of IDD recognition on the overall information environment. The results in Table 3 suggest that the IDD decreases the overall production of firm-specific information, as evidenced by an increase in stock price synchronicity subsequent

[18] Lin et al. (2016) and Dhaliwal et al. (2017) show that a state's recognition of the IDD increases the issuance of management forecasts.

[19] The observed 10K file does not contain original proprietary information that has been redacted, making word counts an appropriate measure of nonproprietary information disclosure. R&D disclosures, however, would increase the 10-K word counts and therefore contaminate the 10-K word counts as a measure of non-proprietary information disclosure. In an alternative specification, we include word counts of R&D disclosures as an additional control variable in the 10-K word count regression and find similar results (untabulated for brevity).

to the recognition of the IDD in state courts. In other words, the increase in nonproprietary information disclosure does not entirely compensate for the decline in firm-specific information caused by the decrease in proprietary information disclosure.

[Insert Table 10 here]

Real effects of disclosure changes in response to the recognition of the IDD

Managers disclose proprietary information to the capital market because investors demand value-relevant information for their valuation decisions. Proprietary information is firm-specific by its nature and can more effectively reduce the information asymmetry between investors and managers, resulting in larger capital market benefits. When firms reduce the disclosure of proprietary information, they sacrifice capital market benefits for product market benefits. Such a decision is optimal if the increase in product market benefits exceeds the decrease in capital market benefits.

In this section, we examine the economic consequences of the decrease in proprietary information disclosure in the product and capital markets. To pin down any real effects to the change in disclosures resulting from IDD recognition, we estimate a two-stage model. Specifically, we first estimate annual changes in price synchronicity, R&D disclosure, and 10-K redaction by regressing $\Delta Sync$, $\Delta Adj\_R\&D\_Count$, and $\Delta 10K\_Redaction$ on the IDD indicator (*IDD*), *IDD*×*Rejection_State*, and the change of other determinants of stock price synchronicity and proprietary information disclosures in column (4) of Table 3 and columns (2) and (4) in Table 4, respectively. The predicted values estimated from the first-stage regressions reflect the effect of the IDD on changes in stock price synchronicity and proprietary information disclosures. Then in the second stage, we examine the effect of the predicted changes in price synchronicity and

proprietary information disclosures on changes in firms' market share, cost of equity, and firm market value. To make the interpretation of second-stage results easier, we multiply the predicted value of Δ*Adj_R&D_Count* by -1, so that any increase in the dependent variable can be interpreted as the consequence of a decrease in disclosure. We regress annual changes in firm's market share and cost of equity on lagged predicted changes in stock price synchronicity and proprietary information disclosures. We regress annual changes in firm market value on concurrent changes in stock price synchronicity and proprietary information disclosures, as firm value reflects all concurrent and forward-looking information (Fama and French 1998). We measure a firm's market share as the percentage of a firm's sales over the total sales of its three-digit SIC industry. Following Easton (2004), we compute the cost of equity as the square root of analyst forecast of two-year-ahead earnings minus forecasts of one-year-ahead earnings, scaled by stock prices. We measure the firm's market value by the market value of its total assets over the book value of total assets.[20] The results of the second-stage regressions are reported in Table 11.[21] Panel A shows that the predicted increase in price synchronicity and 10-K redaction lead to a significant increase in market share. A one-standard-deviation increase in the predicted change of synchronicity Δ*Sync_pred* (0.045) leads to an increase in market share by 0.009% (0.002*0.045), which amounts to 3% of the standard deviation of Δ*Mkt*_Share (0.003). In Panel B, we find that the predicted increase in price synchronicity and the decrease in R&D disclosure in 10-Ks lead to a significant increase in the cost of equity. A one-standard-deviation increase in Δ*Sync_pred* leads to an increase in the cost of equity by 0.18% (0.040*0.045), which is economically meaningful. In Panel C, the

[20] The market value of total assets is calculated as the market value of equity (share price multiplied by shares outstanding) plus the book value of total assets minus the book value of equity, divided by 100.

[21] The number of observations is smaller in Table 11, because the sample in each panel is limited by the availability of data for calculating the dependent variables. In addition, observations in 1994 are dropped, because we measure annual changes of all variables.

results show that the predicted increase in stock price synchronicity and the predicted decrease in proprietary information disclosure in relation to the recognition of the IDD significantly increase firms' market-to-book ratio of total assets. A one-standard-deviation increase in $\Delta Sync\_pred$ leads to an increase in firms' market-to-book ratio by 0.023% (0.005*0.045).

Overall, we find that the reduction in proprietary information disclosure leads to greater market share, higher cost of equity, and higher market value. The results provide support for our argument that due to higher protection of trade secrets offered by the IDD, managers reduce the disclosure of proprietary information for product market benefits at the expense of capital market benefits. In addition, the increase in market value suggests that the gains in the product market outweigh the losses in the capital market.

[Insert Table 11 here]

VI Conclusion

In this study, using stock price synchronicity as a summary measure of firm-specific information incorporated in stock prices, we examine the effects of trade-secret protection on corporate disclosure and overall information production. We argue that the recognition of the IDD in state courts increases the cost of disclosing proprietary information, causing firms to reduce the disclosure of proprietary information. However, firms may increase the disclosure of nonproprietary information to cater to capital market investors and analysts' demand. We examine stock price synchronicity to capture the net effect of trade-secret protection on the overall production of firm-specific information.

Applying the DiD research design, we find that stock price synchronicity increases following states' recognition of the IDD, supporting that, on average, IDD recognition decreases

the amount of firm-specific information incorporated in stock prices. We also find that states' IDD recognition leads to less disclosure of proprietary information, as measured by a decrease in R&D disclosure and an increase in the redaction of confidential information in 10-K filings. Nonproprietary information disclosures, however, increase after states' recognition of the IDD. We also find that the decrease in the disclosure of proprietary information in response to the recognition of the IDD leads to an increase in market share, cost of equity, and market value, suggesting that managers sacrifice capital market benefits for greater product market benefits by decreasing the disclosure of proprietary information after the recognition of the IDD.

Collectively, our findings provide support for the proprietary-cost argument of corporate disclosure: The better protection of trade secrets via states' IDD recognition increases the costs of disclosing proprietary information. By examining the real effects of changed disclosures resulting from the recognition of the IDD, we also add to the literature on the trade-off of product market benefits and capital market benefits in managers' disclosure choice. The evidence that the IDD results in less firm-specific information incorporated in stock prices offers important implications for policymakers. Considering the functional efficiency of stock prices, the provision of less firm-specific information in stock prices may result in suboptimal capital allocation by investors, which may hinder the stock market's development and proper functioning.

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Appendix A: Examples of proprietary information disclosures

Companies	Period	Disclosure in 10-Ks about material contracts
Kellwood Company (Louisiana, MO)	1997 (Pre-IDD)	10K Exhibit 10.6 (7/15/1997) Grant of License As to Developed Software [confidential treatment requested], EDS will grant to Kellwood an irrevocable, perpetual, world-wide, royalty-free, nonexclusive license to both object code and source code of the Developed Software, effective as of the date of its implementation; provided, however, that except with the prior written consent of EDS, which consent will not be unreasonably withheld, or to the extent required by natural disaster or similar emergency, the Developed Software will not be operated, directly or indirectly, (i) by persons other than bona fide employees of Kellwood, or (ii) on equipment that is not under the control of Kellwood. In the event Kellwood enters into an agreement with a third-party service provider for provision of services which require Access to the Developed Software, EDS will consent to Access for that provider to perform services for Kellwood upon that third-party service provider's executing with EDS a non-disclosure and non-compete agreement satisfactory to EDS. Kellwood agrees that, except with the prior written consent of EDS as described in sub-Section 6.7(c), only Kellwood work shall be processed utilizing Developed Software. Kellwood agrees that it will keep the Developed Software confidential, will not at any time allow the Developed Software, or any of the various components thereof or any modifications thereto, to be disclosed to any party, or to be sold, licensed, assigned, leased or commercially exploited or marketed in any way, with or without charge, by Kellwood or its employees or agents and, except to the extent required for normal operation of the Developed Software as permitted in this Agreement in the day to day business operations of Kellwood, will not permit the Developed Software to be copied or reproduced, in whole or in part, by any party at any time. … ... Time of Payment Any sum due EDS under this Agreement or which a time for payment is not otherwise specified

		will be due and payable 30 days from the EDS invoice date. Any sum due EDS under this Agreement that is not paid when due shall bear interest from its due date until paid at the lesser of (a) [confidential treatment requested] percent per annum more than the prime rate established from time to time by Citibank, New York N.A., or (b) the maximum rate of interest allowed by applicable law. https://www.sec.gov/Archives/edgar/data/55080/0000950114-97-000335.txt
Kellwood Company (Louisiana, MO)	2002 (Post-IDD)	10K/A Exhibit 10.6 (6/21/2002) Transfer of assets EDS shall convey to Kellwood, from among those assets then held by EDS for the provision of Services to Kellwood, other than those assets expressly identified by the Parties from time to time as Shared Resources, such assets as Kellwood may select, at a price which is the lesser of the [confidential treatment requested] or [confidential treatment requested] if such transfer occurs greater than thirty (30) months past the Contract Signing Date or at the lesser of [confidential treatment requested] or the [confidential treatment requested] and [confidential treatment requested] if such transfer occurs less than or equal to thirty (30) months past the Contract Signing Date. Such assets will be provided on an "AS IS, WHERE IS" basis. EDS shall promptly remove from Kellwood's premises any EDS assets that Kellwood, or its designee, chooses not to purchase. … … Invoices All invoices submitted by EDS must meet with the approval of Kellwood prior to payment. EDS shall not submit invoices until the last day of each month where services were delivered, or as may be otherwise specified in this Agreement. Invoices must reference this Agreement and provide detailed information as requested by Kellwood in accordance with Schedules A through F. Invoices shall be accompanied by information and data that support the invoiced Fees. Unless otherwise provided, invoices are payable within

		[confidential treatment requested] of invoice correct as to the form agreed by the Parties. Kellwood may dispute any invoice in accordance with the provisions of this Agreement. Any undisputed amount not paid when due will bear interest until paid at the lessor of (a) the maximum rate of interest allowed by applicable law or (b) a rate of interest equal to the following: o Upon the first occurrence of late payment, the interest rate shall [confidential treatment requested] established from time to time by Citibank of New York, "Prime" o Upon the second separate occurrence of late payment, the interest rate shall equal [confidential treatment requested] o Upon the third and subsequent separate occurrences of late payment, the interest rate shall equal [confidential treatment requested] https://www.sec.gov/Archives/edgar/data/55080/000102140802008663/dex106.txt

Appendix B: Definition of variables

Dependent	
Sync	Measure of synchronicity, defined as $\ln(R^2/(1-R^2))$, where R^2 is obtained from regressing firm weekly returns on the market and industry current and lagged weekly returns over the year
Adj_R&D_Count	The number of R&D related key words in 10-Ks, adjusted for the 3-digit SIC industry median in each year
10K_Redaction	The number of mentions of "confidential request" and "confidential treatment" in 10-Ks
Ln(1+#_MF)	Natural logarithm of one plus the number of management forecasts issued on quarterly earnings in a given year
Ln(#_Words)	Natural logarithm of the number of words in the 10-K file
IDD	
IDD	A dummy variable that takes the value of 1 if the IDD is in effect during a particular year in the state where the firm is headquartered, and zero otherwise
Rejection_State	A dummy variable that takes the value of 1 if a firm is headquartered in one of the three rejection states (Texas, Florida, and Michigan), and zero otherwise.
$Adopt_{-1}$	A dummy variable that takes the value of 1 if a state will recognize the IDD in the next year, and zero otherwise
$Adopt_0$	A dummy variable that takes the value of 1 if a state will recognize the IDD in the current year, and zero otherwise
$Adopt_1$	A dummy variable that takes the value of 1 if a state has recognized the IDD one year ago, and zero otherwise
$Adopt_2$	A dummy variable that takes the value of 1 if a state has recognized the IDD two years ago, and zero otherwise
$Adopt_3$	A dummy variable that takes the value of 1 if a state has recognized the IDD three years ago, and zero otherwise
$Adopt_{4+}$	A dummy variable that takes the value of 1 if a state has recognized the IDD at least four years ago, and zero otherwise
Control	
Size	Natural logarithm of the market value of equity calculated as the product of closing stock price and the number of common shares outstanding at fiscal year end
MTB	Market value of equity divided by book equity
Lev	Long-term debt plus debt in current liabilities divided by the market value of assets
SD_ROA	Standard deviation of ROA over the last five years, where ROA is income before extraordinary items divided by total assets
Accruals	The absolute value of total accruals (income before extraordinary items minus cash flow from operations) divided by total assets
FundCorr	The synchronicity of earnings, computed as the logged transformed R^2 from regressing corporate quarterly ROAs on industry value weighted ROAs in the previous twelve quarters
$\Delta Inst$	Change in institutional investors' holdings over the year, divided by total shares outstanding over the year
NRev	Natural logarithm of the total number of earnings forecasts and revisions made by analysts over the year
FDiv	The Herfindahl-Hirschman (HH) index of segment sales

Ind_Size	Natural logarithm of the number of firms in each industry
Ind_HH	The industry sales HH index
InstHold	Percentage of shares owned by institutional investors
AnaCov	Number of analysts covering the firm over the year
SD_Ret	Standard deviation of daily stock returns over the previous year

Table 1: Timing of the Recognition of the IDD

This table contains the recognition or rejection dates of the IDD, obtained from Klasa et al. (2018).

State	State name	Date	Decision
AR	Arkansas	3/18/1997	Recognized
CT	Connecticut	2/28/1996	Recognized
DE	Delaware	5/5/1964	Recognized
FL	Florida	7/11/1960	Recognized
FL	Florida	5/21/2001	Rejected
GA	Georgia	6/29/1998	Recognized
IL	Illinois	2/9/1989	Recognized
IN	Indiana	7/12/1995	Recognized
IA	Iowa	4/1/1996	Recognized
KS	Kansas	2/2/2006	Recognized
MA	Massachusetts	10/13/1994	Recognized
MI	Michigan	2/17/1966	Recognized
MI	Michigan	4/30/2002	Rejected
MN	Minnesota	10/10/1986	Recognized
MO	Missouri	11/2/2000	Recognized
NJ	New Jersey	4/27/1987	Recognized
NY	New York	12/5/1919	Recognized
NC	North Carolina	6/17/1976	Recognized
OH	Ohio	9/29/2000	Recognized
PA	Pennsylvania	2/19/1982	Recognized
TX	Texas	5/28/1993	Recognized
TX	Texas	4/3/2003	Rejected
UT	Utah	1/30/1998	Recognized
WA	Washington	12/30/1997	Recognized

Table 2: Summary Statistics

This table presents the descriptive statistics of our key variables in Equation (2). The sample period is from 1994 to 2010. The sample consists of 27,471 observations. All variables are as defined in the Appendix B.

	Mean	S.D.	Q1	Median	Q3
Sync	-1.337	1.057	-2.067	-1.317	-0.557
IDD	0.527	0.499	0.000	1.000	1.000
Rejection_State	0.142	0.349	0.000	0.000	0.000
Size	5.762	1.926	4.342	5.762	7.097
MTB	2.711	2.946	1.215	1.943	3.242
Lev	0.198	0.189	0.012	0.166	0.323
SD_ROA	0.076	0.094	0.022	0.044	0.094
Accruals	0.086	0.082	0.033	0.064	0.110
FundCorr	-2.576	2.170	-3.784	-2.268	-1.044
Δ*Inst*	0.065	0.068	0.017	0.043	0.089
NRev	2.312	1.522	1.099	2.565	3.555
FDiv	0.752	0.303	0.503	1.000	1.000
Ind_Size	5.096	1.146	4.248	5.333	6.094
Ind_HH	0.077	0.071	0.040	0.051	0.085
ROA	0.017	0.148	-0.005	0.042	0.087
InstHold	0.531	0.294	0.279	0.551	0.781
AnaCov	7.167	7.578	1.000	5.000	11.000
SD_Ret	0.035	0.017	0.022	0.031	0.044

Table 3: The IDD and Stock Price Synchronicity

This table shows the effect of the IDD on stock price synchronicity. The dependent variable, *Sync*, is estimated as transformed R^2 from Equation (1). *IDD* is an indicator variable that takes the value of 1 if the IDD is in effect during a given year in the state where the firm is headquartered, and 0 otherwise. *Rejection_State* is a dummy variable that takes the value of 1 if a firm is headquartered in one of the three rejection states (Texas, Florida, and Michigan), and zero otherwise. All other variables are as defined in the Appendix B. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)	(4)
Dependent	*Sync*	*Sync*	*Sync*	*Sync*
IDD	0.102**	0.141***	0.165***	0.095***
	(2.389)	(3.421)	(4.867)	(3.158)
*IDD*Rejection_State*	-0.289***	-0.290***	-0.254***	-0.186*
	(-3.207)	(-3.786)	(-3.837)	(-1.770)
Size		0.236***	0.232***	0.236***
		(16.430)	(27.727)	(16.418)
MTB		-0.004	-0.009***	-0.005
		(-1.150)	(-4.103)	(-1.406)
Lev		-0.139**	-0.094***	-0.116**
		(-2.625)	(-2.984)	(-2.095)
SD_ROA		0.195	0.143*	0.171
		(1.348)	(1.796)	(1.183)
Accruals		0.019	0.020	0.008
		(0.283)	(0.385)	(0.123)
FundCorr		0.006***	0.014***	0.006***
		(2.759)	(5.438)	(2.777)
Δ*Inst*		-0.133	-0.111*	-0.147*
		(-1.564)	(-1.689)	(-1.872)
NRev		0.084***	0.111***	0.087***
		(8.709)	(12.772)	(9.294)
FDiv		-0.069*	-0.060**	-0.067*
		(-1.944)	(-2.510)	(-1.932)
Ind_Size		-0.055	-0.040	-0.032
		(-0.794)	(-0.781)	(-0.485)
Ind_HH		-0.200	0.173	-0.309
		(-0.824)	(0.751)	(-1.384)
Constant	-2.841***	-3.708***	-3.408***	-4.004***
	(-133.646)	(-9.427)	(-11.629)	(-10.242)

Firm fixed effects	Yes	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed	No	No	Yes	No
State fixed	No	No	Yes	No
State*time trend	No	No	No	Yes
Observations	27,471	27,471	27,471	27,471
Adjusted R^2	0.506	0.529	0.467	0.531
F-test statistics for the sum of the coefficients on *IDD* and *IDD*Rejection_State*	5.00**	5.23**	3.63*	0.69

Table 4: The IDD and Disclosure of Proprietary Information

This table shows the effect of recognizing the IDD on proprietary information disclosures. The dependent variables capture R&D disclosure and the redaction of confidential information in 10-K filings made by a firm over the year. *IDD* is an indicator variable that takes the value of 1 if the IDD is in effect during a given year in the state where the firm is headquartered, and 0 otherwise. *Rejection_State* is a dummy variable that takes the value of 1 if a firm is headquartered in one of the three rejection states (Texas, Florida, and Michigan), and zero otherwise. All other variables are as defined in the Appendix B. Firm and year fixed effects are included in all regressions. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)	(4)
Dependent	*Adj_R&D_Count*	*Adj_R&D_Count*	*10K_Redaction*	*10K_Redaction*
IDD	-0.126**	-0.122**	0.440***	0.447***
	(-2.666)	(-2.564)	(2.697)	(2.716)
*IDD*Rejection_State*	0.074	0.082	-0.380*	-0.377*
	(0.752)	(0.875)	(-1.982)	(-1.954)
Size		0.033*		-0.014
		(1.922)		(-0.285)
MTB		-0.007		0.032
		(-1.185)		(1.512)
Lev		0.193		0.064
		(1.540)		(0.296)
ROA		-0.277		0.150
		(-1.637)		(0.551)
InstHold		0.242**		0.139
		(2.220)		(0.757)
AnaCov		0.002		-0.009
		(0.485)		(-0.824)
SD_Ret		3.317***		-2.869**
		(3.515)		(-2.017)
Constant	0.894***	0.482***	0.662***	0.581**
	(21.729)	(4.172)	(4.579)	(2.020)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
State*time trend	Yes	Yes	Yes	Yes
Observations	26,541	26,541	26,607	26,607
Adjusted R^2	0.657	0.658	0.396	0.396
F-test statistics for the sum of the coefficients on *IDD* and *IDD*Rejection_State*	0.29	0.20	0.49	0.77

Table 5: IDD Recognition: Validity Test

This table shows the validity of the IDD recognition as a shock not driven by firms' pre-existing disclosure incentive. The dependent variable is *IDD* that equals 1 is the IDD is in effect in the state-year and 0 otherwise. The variable of interest is *Sync*, estimated as transformed R^2 from Equation (1) in column (1) and R&D disclosure and the redaction of confidential information in 10-K filings in columns (2) and (3), respectively. The St_* variables are state average of firm-level variables over three years. We also include state GDP growth and unemployment rate averaged over three years, state and year fixed effects. All other variables are as defined in the Appendix B. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)
Dependent	*IDD*	*IDD*	*IDD*
St_Sync	-0.036		
	(-1.153)		
St_Adj_R&D_Count		0.017	
		(0.462)	
St_10K_Redaction			0.003
			(0.841)
GDP_Gth	-0.001	-0.002	-0.002
	(-0.089)	(-0.167)	(-0.172)
Unemploy_Rate	0.021	0.015	0.017
	(0.370)	(0.275)	(0.308)
Constant	0.019	0.118	0.110
	(0.055)	(0.360)	(0.333)
State fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	749	749	749
Adjusted R^2	0.779	0.778	0.778

Table 6: The IDD and Stock Price Synchronicity and Disclosure of Proprietary information: Dynamic Regressions

This table shows the effect of recognizing the IDD on stock price synchronicity and proprietary information disclosures using dynamic regressions. The dependent variable, *Sync*, is estimated as transformed R^2 from Equation (1). $Adopt_n$ is an indicator variable that takes the value of 1 if the state will recognize the IDD in |n| years (n<0) or has recognized the IDD n years ago (n>0). $Adopt_{4+}$ takes the value of 1 if the IDD has been recognized for at least 4 years in a state. All other variables are as defined in the Appendix B. Firm and year fixed effects are included in all regressions. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)
Dependent	Sync	*Adj_R&D_Count*	*10K_Redaction*
$Adopt_{-1}$	-0.098	0.013	0.108
	(-1.540)	(0.164)	(0.741)
$Adopt_0$	-0.041	0.059	0.216
	(-0.666)	(0.425)	(0.860)
$Adopt_1$	-0.059	-0.062	0.519
	(-1.123)	(-0.367)	(1.641)
$Adopt_2$	0.107*	-0.182	0.909**
	(1.860)	(-1.440)	(2.489)
$Adopt_3$	0.115**	-0.202*	0.491*
	(2.228)	(-1.880)	(1.704)
$Adopt_{4+}$	0.107**	-0.112	0.560*
	(2.289)	(-1.038)	(1.679)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
State*time trend	Yes	Yes	Yes
Observations	23,569	22,760	22,819
Adjusted R^2	0.522	0.655	0.398

Table 7: The IDD and Stock Price Synchronicity and Disclosure of Proprietary information: Matched Sample

This table shows the effect of recognizing the IDD on price synchronicity and proprietary information disclosures using the matched sample. *IDD* is an indicator variable that takes the value of 1 if the IDD is in effect during a given year in the state where the firm is headquartered, and 0 otherwise. All other variables are as defined in the Appendix B. Firm and year fixed effects are included in all regressions. For each firm in an IDD-recognizing state, we match it with a control firm in non-recognizing states in the year prior to the IDD recognition matched based on industry, and the change of price synchronicity (Sync) from year t-3 to year t-1 where year t is the year of IDD recognition. In this analysis, we limit the sample to year t-1 to year t+4. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)
Dependent	*Sync*	*Adj_R&D_Count*	*10K_Redaction*
IDD	0.112*	-0.257**	0.787*
	(1.899)	(-2.056)	(2.021)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
State*time trend	Yes	Yes	Yes
Observations	2,004	1,957	1,969
Adjusted R^2	0.505	0.778	0.414

Table 8: The IDD and Stock Price Synchronicity and Disclosure of Proprietary information: IDD vs. UTSA and Non-Compete Enforcement

This table shows the effect of recognizing the IDD on price synchronicity and proprietary information disclosures after controlling for the state level UTSA passage and enforcement of non-compete agreements. *IDD* is an indicator variable that takes the value of 1 if the IDD is in effect during a given year in the state where the firm is headquartered, and 0 otherwise. *Rejection_State* is a dummy variable that takes the value of 1 if a firm is headquartered in one of the three rejection states (Texas, Florida, and Michigan), and zero otherwise. UTSA is an indicator variable that takes the value of 1 if UTSA is passed in a state in a given year, and 0 otherwise. Non-compete is non-compete agreement enforceability index from Ertimur et al. (2018). All other variables are as defined in the Appendix B. Firm and year fixed effects are included in all regressions. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)
Dependent	*Sync*	*Adj_R&D_Count*	*10K_Redaction*
IDD	0.089***	-0.114**	0.440**
	(2.825)	(-2.499)	(2.629)
*IDD*Rejection_State*	-0.181*	0.071	-0.364*
	(-1.802)	(0.782)	(-1.848)
UTSA	-0.004	0.047	-0.089
	(-0.208)	(0.638)	(-0.759)
Non-Compete	0.017	-0.009	-0.013
	(1.151)	(-0.430)	(-0.379)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
State*time trend	Yes	Yes	Yes
Observations	27,471	26,541	26,607
Adjusted R^2	0.531	0.658	0.396
F-test statistics for the sum of the coefficients on *IDD* and *IDD*Rejection_State*	0.69	0.23	0.92

Table 9: Operating States

This table shows the effect of recognizing the IDD on price synchronicity and proprietary information disclosures using the alternative sample where firms in the top quartile of the distribution of the number of out-of-state cities mentioned in 10-Ks are excluded. *IDD* is an indicator variable that takes the value of 1 if the IDD is in effect during a given year in the state where the firm is headquartered, and 0 otherwise. *Rejection_State* is a dummy variable that takes the value of 1 if a firm is headquartered in one of the three rejection states (Texas, Florida, and Michigan), and zero otherwise. All other variables are as defined in the Appendix B. Firm and year fixed effects are included in all regressions. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)
Dependent	*Sync*	*Adj_R&D_Count*	*10K_Redaction*
IDD	0.096**	-0.182**	0.719***
	(2.676)	(-2.284)	(2.897)
*IDD*Rejection_State*	-0.261**	0.114	-0.642**
	(-2.458)	(1.043)	(-2.404)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
State*time trend	Yes	Yes	Yes
Observations	21,605	20,863	20,923
Adjusted R^2	0.523	0.658	0.390
F-test statistics for the sum of the coefficients on *IDD* and *IDD*Rejection_State*	2.41	0.45	0.57

Table 10: The IDD and Disclosure of Nonproprietary Information

This table shows the effect of recognizing the IDD on the frequency of management forecasts on quarterly earnings and 10-K length. *IDD* is an indicator variable that takes the value of 1 if the IDD is in effect during a given year in the state where the firm is headquartered, and 0 otherwise. *Rejection_State* is a dummy variable that takes the value of 1 if a firm is headquartered in one of the three rejection states (Texas, Florida, and Michigan), and zero otherwise. All other variables are as defined in the Appendix B. Firm and year fixed effects are included in all regressions. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

	(2) *Ln(1+# MF)*	(3) *Ln(# Words)*
IDD	0.045**	0.047**
	(2.211)	(2.011)
*IDD*Rejection_State*	-0.028	-0.019
	(-0.707)	(-0.626)
Size	0.016*	0.031***
	(1.977)	(3.459)
MTB	-0.006***	-0.006***
	(-3.315)	(-3.268)
Lev	0.078***	0.408***
	(2.909)	(8.985)
ROA	0.004	-0.278***
	(0.120)	(-11.740)
InstHold	0.185***	0.107***
	(5.133)	(3.241)
AnaCov	0.009***	0.001
	(5.712)	(1.156)
SD_Ret	-1.042***	2.024***
	(-3.232)	(8.694)
Constant	0.058	8.552***
	(1.147)	(174.652)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
State*time trend	Yes	Yes
Observations	26,297	26,205
Adjusted R^2	0.474	0.750
F-test statistics for the sum of the coefficients on *IDD* and *IDD*Rejection_State*	0.23	1.82

Table 11: Real Effects of Disclosure Changes in Response to the IDD

This table shows the effect of disclosure changes in response to the IDD on changes of market share, cost of equity and market-to-book ratio of assets. Δ*Mkt_Share* is the annual change in firms' market share of sales in each industry; Δ*COE* is the change in cost of equity capital, where cost of equity capital is computed following Easton (2004); Δ*MTB* is the change in market-to-book ratio of assets. Δ*Sync_pred*, Δ*Adj_R&D_Count_pred*, and Δ*10K_Redaction_pred* are predicted values from the first stage regression where Δ*Sync*, Δ*Adj_R&D_Count*, and Δ*10K_Redaction* are regressed on *IDD*, *IDD*×*Rejection_State*, and the changes of the determinants of stock price synchronicity and proprietary information disclosures in column (4) of Table 3 and columns (2) and (4) in Table 4, respectively. We multiply the predicted value of Δ*Adj_R&D_Count* by -1 so that any increase in the dependent variable can be interpreted as the consequence of a decrease in disclosure. All other variables are as defined in the Appendix B. Firm and year fixed effects are included in all regressions. State clustered t-statistics are reported in the parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

Panel A: Market Share

		(1)	(2)	(3)
Dependent	Predicted Sign	Δ*Mkt_Share*	Δ*Mkt_Share*	Δ*Mkt_Share*
Δ*Sync_pred*	+	0.002***		
		(3.988)		
Δ*Adj_R&D_Count_pred*	+		-0.000	
			(-0.266)	
Δ*10K_Redaction_pred*	+			0.001**
				(2.172)
Control variables		Yes	Yes	Yes
Firm fixed effects		Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes
State*time trend		Yes	Yes	Yes
Observations		15,947	15,118	15,159
Adjusted R^2		0.109	0.104	0.107

Panel B: Cost of Equity

		(1)	(2)	(3)
Dependent	Predicted Sign	Δ*COE*	Δ*COE*	Δ*COE*
Δ*Sync_pred*	+	0.040*		
		(1.958)		
Δ*Adj_R&D_Count_pred*	+		0.035**	
			(2.058)	
Δ*10K_Redaction_pred*	+			0.007
				(0.417)
Control variables		Yes	Yes	Yes
Firm fixed effects		Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes
State*time trend		Yes	Yes	Yes
Observations		7,382	6,882	6,901
Adjusted R^2		0.129	0.140	0.137

Panel C: Market-to-book ratio

		(1)	(2)	(3)
Dependent	Predicted Sign	Δ*MTB*	Δ*MTB*	Δ*MTB*
Δ*Sync_pred*	?	0.005***		
		(10.664)		
Δ*Adj_R&D_Count_pred*	?		0.003***	
			(7.540)	
Δ*10K_Redaction_pred*	?			0.004***
				(6.936)
Control variables		Yes	Yes	Yes
Firm fixed effects		Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes
State*time trend		Yes	Yes	Yes
Observations		14,612	13,808	13,842
Adjusted R^2		0.183	0.118	0.179