THE RISK OF KNOWLEDGE SPILLOVERS AND CORPORATE SOCIAL RESPONSIBILITY:
EVIDENCE FROM THE INEVITABLE DISCLOSURE DOCTRINE

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ABSTRACT

In this study, we theorize and empirically examine whether companies respond to the threat of knowledge spillovers by strategically increasing their engagement in corporate social responsibility (CSR). To obtain exogenous variation in the threat of knowledge spillovers, we exploit a natural experiment provided by the rejection of the inevitable disclosure doctrine (IDD) by several U.S. states between 1991 and 2013. Since the doctrine prevents employees with valuable know-how from working for a competitor in the immediate future, the doctrine’s rejection facilitates knowledge appropriation by rivals. Using a difference-in-differences methodology, we find that companies react to the increased threat of knowledge spillovers by increasing their CSR. We further provide evidence that the increase in CSR is stronger for companies i) located closer to innovation hubs as well as companies operating in industries that are ii) more R&D intensive, iii) more competitive, and iv) have more attractive investment opportunities. Overall, these results are consistent with the notion that CSR serves as a strategic tool to mitigate the risk of knowledge spillovers.

Keywords: knowledge spillovers; corporate social responsibility; strategic human capital; inevitable disclosure doctrine; difference-in-differences.

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1. Introduction

A firm’s ability to innovate and adapt to changes in the business environment is essential for firm survival and sustaining a competitive advantage (e.g., Eisenhardt and Martin 2000, Flammer and Ioannou 2015, Helfat et al. 2007, Teece, Pisano, and Shuen 1997). As such employee know-how is a key source of sustained competitive advantage (e.g., Barney 1991, Hall 1993). Yet, it also represents a major managerial challenge, as employees with valuable skills and knowledge are the most likely ones to walk out the door (Coff 1997, Ganco, Ziedonis, and Agarwal 2015, Kacperczyk 2012), taking their valuable skills and knowledge with them to join rival firms or create new ventures. This may lead to inter-firm knowledge spillovers (Agarwal, Ganco, and Ziedonis 2009, Almeida and Kogut 1999, Rosenkopf and Almeida 2003) and declines in explorative and path-breaking R&D projects (Conti 2014), ultimately undermining the competitive advantage of the focal firm (Campbell et al. 2012). Hence, understanding how to effectively deal with the managerial challenge of retaining knowledge workers and counteracting the threat of knowledge spillovers is at the very core of strategic management and has important implications for innovation and entrepreneurship (for a review, see Agarwal, Gambardella, and Olson 2014).

Scholars across disciplines have long argued that employees’ propensity to change jobs depends on their perception of the current employment in relation to their outside option (Carsten and Spector 1987, Rusbult et al. 1988). Hence, firms can mitigate the risk of turnover and mobility-induced knowledge spillovers by managing knowledge workers’ perception of their current job. Yet, designing effective retention tools is difficult (e.g., Bloom and Michel 2002, Carnahan, Agarwal, and Campbell 2012, Larkin, Pierce, and Gino 2012, Lazear 1989, Nickerson and Zenger 2008, Pfeffer and Davis-Blake 1992). While the focus of extant research has been on pecuniary incentives, the use of relationship-based practices to retain valuable employee know-how has remained largely unexplored in the strategy literature. In this paper, we aim to shed light on this question.

Drawing from different strands of the literature, we propose that firms counter the threat of knowledge spillovers by increasing their engagement in corporate social responsibility (CSR), as the latter
can help manage knowledge workers’ perception of their current job in several ways. First, a firm’s focus on the needs of their employees and other stakeholders likely reduces employees’ concerns and improve the overall reputation of the firm as a workplace. Moreover, stakeholder orientation has been shown to foster knowledge creation and innovation (Flammer and Kacperczyk 2015), which likely improves knowledge workers’ perception of the firm as innovative workplace, and attenuates competitors’ ability to poach talent and appropriate valuable know-how. Second, job-related CSR business practices can improve the attractiveness of the work content, allowing employees to have (direct or indirect) social and environmental impact. Lastly, companies’ CSR practices can enhance employees’ loyalty to the firm by strengthening their social ties and identification with the firm. In sum, the above arguments suggest that CSR practices can positively influence knowledge workers’ perception of their current job and hereby mitigate the risk that they take their valuable skills and knowledge to rival firms. Hence, we posit that when firms are faced with an increased threat of knowledge spillovers, they react by strategically increasing their CSR.

From an empirical perspective, it is difficult to establish a causal link between the risk of mobility-induced knowledge spillovers and firms’ strategic use of CSR. For example, a negative relationship between firms’ CSR practices and the risk of knowledge spillovers may be spurious if such a relationship is driven by unobserved firm characteristics that enhance both a firm’s propensity to foster an employee-friendly work environment and its ability to prevent knowledge spillovers. This concern is especially acute as firm-level attributes such as managerial talent, while difficult to observe, are likely to drive both a firm’s investments in stakeholder initiatives and knowledge workers’ propensity to leave the company. Accordingly, leveraging a research design that provides a clean causal estimate is central to ruling out alternative explanations.

To overcome this empirical challenge, we exploit a quasi-natural experiment provided by the rejection of the inevitable disclosure doctrine by several U.S. states between 1991 and 2013. This doctrine prevents employees with valuable know-how from working for a competitor in the immediate future, as they would inevitably disclose their current employer’s trade secrets. As such, the inevitable disclosure
doctrine provides employers with a strong mechanism to restrict knowledge workers’ mobility and hence knowledge spillovers (e.g., Gilson 1999, Png and Samila 2015), as the mere possibility of trade secret disclosure is sufficient for this doctrine to apply (i.e., no actual disclosure needs to have occurred). By focusing on the rejection of the inevitable disclosure doctrine, we are able to test whether companies strategically react to an increased threat of knowledge spillovers by increasing their CSR.

Using a difference-in-differences methodology, we find that following the rejection of the inevitable disclosure doctrine, companies significantly increase their CSR (as proxied by the Kinder, Lydenberg, and Domini (KLD) index of social performance). We further find that the effect is stronger for companies that are i) located closer to innovation hubs as well as companies operating in industries that are ii) more R&D intensive, iii) more competitive, and iv) have more attractive investment opportunities. These findings are robust to a large number of robustness checks. Overall, our results are consistent with the argument that CSR is used as a strategic tool to counter the risk of knowledge spillovers.

This study integrates and contributes to several streams of literature. In particular, it highlights a novel mechanism—corporate social responsible practices—that firms use in an attempt to alleviate the risk of knowledge spillovers. Moreover, by documenting that the threat of knowledge spillovers induces firms to increase their CSR, our study sheds light on an unexplored antecedent of CSR. In the following, we develop the theoretical arguments in detail, describe the methodology, present the empirical results, and conclude.

2. Theory and Hypotheses

2.1. Strategic Importance of Preventing Knowledge Spillovers and Retaining Knowledge Workers

The strategy literature has long argued that the ability to innovate and adapt to changes in the business environment is critical for firm survival and sustaining a competitive advantage (e.g., Eisenhardt and Martin 2000, Flammer and Ioannou 2015, Helfat et al. 2007, Teece et al. 1997). Moreover, and in the
spirit of the resource-based view of the firm, a firm’s ability to achieve and sustain a competitive advantage is related to its ability to protect the firm’s valuable and rare resources from imitation by competing firms (e.g., Barney 1991, Mahoney and Pandian 1992, Rumelt, 1984). As such, a firm’s employee know-how is a key source of sustained competitive advantage (e.g., Hall 1993). This know-how is particularly valuable if it is firm-specific as it is not tradable or applicable outside the focal firm, making it difficult for competing firms to imitate (Coff 1997, Dierickx and Cool 1989, Grant 1996, Kogut and Zander 1992).

On the flip side, employee know-how that is also of value to competing companies (i.e., general human capital as opposed to firm-specific human capital) offers no such protective shield. Indeed, such employee know-how can put firms in a potentially vulnerable position, as employees with valuable skills and knowledge are the most likely ones that will depart from their employer (Coff 1997, Ganco et al. 2015) to join a rival firm or create a new venture (Kacperczyk 2012, 2013), hereby taking their skills and knowledge away from the focal firm to the new employer. Moreover, competing firms may actively poach employees with valuable skills and knowledge to gain access to the focal firm’s knowledge sources and technological expertise (Businessweek 2000, Rao and Drazin 2002). Both can have dire consequences for the focal firm as they may enhance, e.g., technological knowledge transfer (e.g., Almeida and Kogut 1999, Rosenkopf and Almeida 2003, Song, Almeida, and Wu 2003) and the rival firm’s product innovation (Rao and Drazin 2002). More generally, inter-firm employee mobility and knowledge spillovers likely enhance the competitiveness of the rival firm and, in turn, undermine the focal firm’s competitive advantage and performance (Campbell et al. 2012, Phillips 2002, Wezel, Cattani, and Pennings 2006).\(^1\) In addition, replacing employees with valuable skills and knowledge may turn out to be challenging as the pool of talented employees is limited and rebuilding the knowledge base (e.g., in terms

\(^1\) This detrimental effect of inter-firm knowledge spillovers on the focal firm is in sharp contrast to the positive effect knowledge spillovers can have on entrepreneurial activity (e.g., Agarwal, Audretsch, and Sarkar 2010, Agarwal et al. 2004, Burton, Sorensen, and Beckman 2002, Chatterji 2009, Gambardella and Giarratana 2010), geographic clustering of industries (e.g., Audretsch and Feldman 1996, Berchicci, King, and Tucci 2011, Krugman 1991), and growth in industries, regions, and economies (e.g., Agarwal, Audretsch, and Sarkar 2007, Grossman and Helpman 1991, Romer 1986).
of understanding the organization and business of the firm) can be difficult (e.g., Wang, He, and Mahoney 2009, Wang and Lim 2008). In short, and as Agarwal et al. (2014) highlight, the departure of knowledge workers—whether to rival established firms or entrepreneurial ventures—facilitates knowledge diffusion across firms and significantly increases the risk of knowledge spillovers. This represents a significant threat to the company’s competitiveness. Accordingly, understanding how firms respond to the risk of knowledge spillovers lies at the core of strategic management.

2.2. Retaining Strategic Human Capital and Employee Retention Tools

The managerial challenge of minimizing the threat of (voluntary) employee turnover and knowledge spillovers has spurred a large literature in management, economics, and psychology. For example, a burgeoning literature argues that institutional factors can help protect the focal firm from losing its key source of sustained competitive advantage to rival firms. Specifically, the inevitable disclosure doctrine, non-compete covenants, and patent enforcement severely constrain the mobility of knowledge workers (e.g., Ganco et al. 2015, Gilson 1999, Marx 2011, Marx, Strumsky, and Fleming 2009, Png and Samila 2015), and help reduce the risk of knowledge spillovers and imitation by rival firms (e.g., Agarwal et al. 2009, Kim and Marschke 2005). In the absence of such legal tools though, companies need to use alternative levers to mitigate the risk of knowledge spillovers.

Since employees’ propensity to change jobs depends on their perception of the current employment in relation to their outside option (Carsten and Spector 1987, Coff 1997, Rusbult et al. 1988), firms can strategically mitigate knowledge workers’ propensity to job hop by raising their perception of their current job. To do so, managers can use various employee governance tools that encompass both pecuniary and relationship-based aspects of job satisfaction (e.g., Coff 1997, Huselid 1995).

However, designing effective retention tools is challenging. First, an effective employee retention tool should align individual and organizational interests to create rents. Second, from a strategic perspective, such a tool should also consider the implications for rent appropriation. Considering the latter is particularly relevant for managing employees with valuable skills and knowledge since—due to their
strategic importance for achieving a sustainable competitive advantage—they have increased bargaining power and, as a result, are better able to appropriate rents (e.g., Castanias and Helfat 1991, 2001, Coff 1999).

While the main focus of extant research has been on the design of pecuniary incentives to engage and retain employees (e.g., Bloom and Michel 2002, Holmstrom 1979, Lazear 1995), a large literature points at the drawbacks of pecuniary compensation. (For reviews, see, e.g., Akerlof and Kranton 2005, Gibbons 1998, and Prendergast 1999). For example, pecuniary compensation is found to make up only a fraction of knowledge workers’ overall job satisfaction (Scarpello and Campbell 1983). On the other hand, compensation dispersion (across and within firms) can trigger equity concerns and dissatisfaction (Kacperczyk and Bazzazian 2015, Larkin et al. 2012, Lazear 1989, Nickerson and Zenger 2008, Pfeffer and Langton 1993), influencing the job hopping decisions of employees (Bloom and Michel 2002, Carnahan et al. 2012, Pfeffer and Davis-Blake 1992). Furthermore, ill-designed pecuniary compensation structures can be counterproductive as they may drive away the most talented and productive employees (Lazear and Rosen 1981), impede the undertaking of ambitious innovative projects (Ederer and Manso 2013, Manso 2011), and generate psychological and social responses that result in a lack of cooperation, illegal misconduct, and other counterproductive behaviors (Larkin and Pierce 2015)—all of which further weaken the firm’s competitiveness, especially in R&D intensive industries. Finally, and importantly, pecuniary compensation directly allocates rents to employees and can easily be imitated by other firms (Coff 1997). Overall, pecuniary compensation may not be effective in sustaining a firm’s competitive advantage.

In short, though extant studies have documented that firms use financial incentives to manage their knowledge workers, many scholars have emphasized the limits of such practices. This further suggests that firms may turn to other, non-financial, tools in order to reduce the risk of losing proprietary knowledge to rivals. While the lion’s share of scholarly attention has been on pecuniary tools, little is known about the use of relationship-based tools to alleviate the risk of knowledge spillovers.
2.3. Corporate Social Responsibility as Strategic Response to the Threat of Knowledge Spillovers

Given the challenges inherent in managing employees with valuable skills and knowledge, companies’ relationship-based initiatives—such as their social responsible practices—are likely to have important implications for a firm’s ability to mitigate the threat of employee mobility and knowledge spillovers. In the following, we argue that firms increase their social responsible practices (with respect to the natural environment, local community, employees, and other stakeholders) to counter the risk of knowledge spillovers, as such practices are likely to influence knowledge workers’ perception of their current job in several ways.

First, by attending to their stakeholders, companies are likely to improve knowledge workers’ perception of the current employer. By catering to the needs of their various stakeholders, firms can reduce employees’ concerns and improve the overall reputation of the firm as a workplace. Indeed, recent surveys suggest that people’s perception of a firm’s CSR practices—such as higher environmental management and product standards, philanthropic activities, global citizenship, transparency, etc.—is a key driver of how people feel about a company and strongly influences their willingness to buy, recommend, invest in, and work for a company (Forbes 2013, McKinsey 2009, Reputation Institute 2015, World Economic Forum 2013). Several senior executives commented on the growing interest that top graduates are showing in their company’s social practices and values. For example, Vernon Ellis of Accenture stated that “young people increasingly want to be associated with an organization that is making a difference in the wider world. And many also want to use their skills in making a contribution themselves.” Jim Copeland, former CEO of Deloitte, further comments that “[a]ttracting and retaining high calibre professionals is imperative, making our responsibility to our people even more important. The best professionals in the world want to work in organizations in which they can thrive. And, they want to work for companies that exhibit good corporate citizenship” (World Economic Forum 2013: 19).

In this vein, recent research suggests that firms’ social responsible practices can enhance employees’ job motivation and labor productivity (e.g., Delmas and Pekovic 2013, Du, Bhattacharya, and
Sen 2015, Flammer 2015a), and likely also help retain employees with valuable skills and knowledge. Moreover, stakeholder orientation is found to spur knowledge creation and innovation as it promotes a secure work environment that is conducive to experimentation and enhances the satisfaction of employees and other stakeholders (Flammer and Kacperczyk 2015). This further augments the firm’s attractiveness as innovative workplace for knowledge workers, and attenuates competitors’ ability to poach talent and appropriate valuable know-how.

Second, job-related CSR business practices are likely to improve the attractiveness of the work content, which may ultimately prevent employees from taking their valuable skills and knowledge to competitors. In particular, business practices such as, e.g., actively engaging knowledge workers in the decision-making process, offering training, advancement, and learning opportunities, providing recognition, and promoting employee participation, fairness, and responsibility in- and outside of the workplace, can improve the attractiveness of the work content and enhance employees’ perception of their current job. Furthermore, corporate social commitment—such as engaging knowledge workers in social initiatives (e.g., pro bono work), encouraging employee participation in philanthropic endeavors, and producing environmental-friendly and fair-trade products—allows employees to have (direct or indirect) social and environmental impact and, as a result, may positively influence knowledge workers’ decision to stay with the company. Several studies are supportive of this argument. In particular, Flammer and Luo (2015), Gambardella et al. (2015), and Nagin et al. (2002) show that firms can improve employees’ motivation by offering shared governance, employee involvement, learning and advancement opportunities, work/life benefit programs (such as flextime), and other employee-related CSR practices. Relatedly, firms with employee-friendly practices show higher labor productivity (Flammer 2015a), and stronger financial performance (e.g., Bloom, Kretschmer, and Van Reenen 2010, Edmans 2011, 2012, Edmans, Li, and Zhang 2015) compared to their peers. Moreover, firms that engage employees in philanthropic activities and are perceived as being fair and caring are better able to attract (e.g., Albinger and Freeman 2000, Burbano 2016, Greening and Turban 2000, Turban and Greening 1996) and promote talented employees (e.g., Burbano, Mamer, and Snyder 2013). Finally, pro bono work can positively
influence employees’ decision to stay with the company despite experiencing a tragic event (Carnahan, Kryscynski, and Olson 2015) or a pay cut (Bode, Singh, and Rogan 2015). Hence, by improving the attractiveness of the work content and enhancing employees’ perception of their current job, CSR practices are likely to help firms retain employees with valuable knowledge.

Finally, CSR programs may strengthen knowledge workers’ loyalty by fostering interpersonal relationships among employees, appealing to their general justice perception (e.g., Colquitt et al. 2001, Rupp et al. 2006), and by enhancing employees’ identification with the firm (Tajfel and Turner 1979). Indeed, prior work argues that employees infer from firms’ CSR engagement whether the managers and the organization are fair-minded on an individual, group, and universal level (Aguilera et al. 2007) and evaluate whether the firm’s attitudes fit with individuals’ identity (Kim et al. 2010). If they fit, then employees develop a sense of belonging and their actions align with organizational interests as reflected in, e.g., higher job satisfaction, stronger organizational commitment, improved citizenship behavior, and job performance (Flammer and Luo 2015, Rupp et al. 2006). Conversely, if they do not fit, then employees may separate from their employer and sort into firms that match with their own identity. In this vein, empirical evidence suggests that by managing employee relations and group demography, companies are able to foster social integration, increase job satisfaction (Dimarco 1975), and influence employee turnover (Jackson et al. 1991, O’Reilly, Caldwell, and Barnett 1989, O’Reilly and Chatman 1986). Furthermore, in controversial industries, employees show greater organizational trust and identification with their company if it engages in environmental-friendly efforts (De Roeck and Delobbe 2012). Conversely, in industries where there is unethical demand, employees show longer tenure if they are unethical themselves and if the organizational ethical norms are aligned with their own (Pierce and Snyder 2015). Finally, as response to organizational decline, employees with high job satisfaction are more likely to actively and constructively try to improve conditions (i.e., use ‘voice’) and show loyalty—in the form of, e.g., passively waiting for conditions to improve or practicing good citizenship—instead of exiting the company (Hirschman 1970, Rusbult et al. 1988). Overall, these studies suggest that companies’ employee relations and other social responsible practices can strengthen employees’ social
ties and identification with the firm, resulting in stronger employee loyalty. It follows that when firms are considerate of their employees and other stakeholders’ needs, knowledge workers are less likely to walk out the door and take their valuable knowledge to rival firms.

In sum, the above arguments suggest that CSR practices help mitigate knowledge workers’ propensity to job hop and attenuate the risk of knowledge spillovers. Moreover, CSR programs are firm-specific and arguably less easily imitable by other companies than pecuniary incentives, thus allowing the focal firm to align employees’ interests with organizational goals without directly allocating rents to their employees. Accordingly, companies will likely consider social responsible practices as a viable tool to prevent the loss of valuable knowledge. We thus expect companies to strategically increase their CSR when faced with an increased threat of knowledge spillovers. This motivates the following hypothesis:

HYPOTHESIS 1. Companies respond to an increase in the threat of knowledge spillovers by increasing their corporate social engagement.

2.4. Cross-Sectional Heterogeneity

The core tenet of our theory is that companies use CSR strategically to counter the threat of knowledge spillovers. To probe this mechanism deeper, we explore the heterogeneity across firms. Since core resources and capabilities often become specialized to the firm’s particular operating context (e.g., Barney, Wright, and Ketchen 2001), we expect that the strategic value of CSR varies across industries, geographies, and other characteristics. Accordingly, we expect the increase in CSR to be amplified when the threat of knowledge spillovers is more severe.

First, the prevention of knowledge spillovers is likely to be a more pressing concern in R&D-intensive industries, where firms’ innovative capabilities are central to competitiveness. Consequently, when faced with an increased threat of knowledge spillovers, companies in R&D-intensive industries are likely to react more strongly and hence increase their CSR more sharply.
Second, we expect that CSR as a strategic lever is particularly valuable for companies located in close proximity to innovation hubs. Arguably, the threat of knowledge spillovers is particularly severe when competing firms are located in close geographic proximity, a strong external network of professionals exists, employer comparison is easy, and more job hopping opportunities exist. Indeed, several studies indicate that the geographic agglomeration of firms can lead to increased interactions between firms and their knowledge workers, resulting in increased knowledge spillovers (e.g., Almeida and Kogut 1999, Mariani et al. 2015) and employee entrepreneurship (e.g., Agarwal et al. 2007, Delgado, Porter, and Stern 2010, Gambardella and Giarratana 2010, Sorenson and Audia 2000). Accordingly, in close proximity to innovation hubs, the risk of losing valuable knowledge is particularly high, and hence we expect the strategic increase in CSR to be higher.

Third, companies facing fiercer competition on the product market need to differentiate themselves from their rivals not only on the product market but also on the labor market. Moreover, in competitive industries, firms’ ability to innovate and retain knowledge is key to survival. Accordingly, the risk of knowledge spillovers is likely higher in competitive industries. We thus expect the increase in CSR to be stronger.

Fourth, the risk of knowledge spillovers is likely higher—and their occurrence more costly—in industries with better investment opportunities. As the example of Silicon Valley illustrates, the prospect of promising investment opportunities is conducive to both increased employee entrepreneurship and aggressive employee poaching practices by established firms and start-ups (e.g., Businessweek 2000, New York Times 2015). Hence, we expect the strategic increase in CSR to be amplified in industries with better investment opportunities.

Finally, the threat of knowledge spillovers is likely lower in states that strongly enforce non-compete agreements. Such agreements restrict employees’ ability to leave their current employer (Garmaise 2009, Marx 2011) and hence reduce the threat of knowledge spillovers. Accordingly, we expect the strategic increase in CSR to be more pronounced in states with weaker enforcement of non-compete agreements.
HYPOTHESIS 2. *In response to an increase in the threat of knowledge spillovers, companies increase their social engagement more strongly if they are i) located closer to innovation hubs, if they operate in industries that are ii) more R&D intensive, iii) more competitive, iv) have more attractive investment opportunities, and if they are v) located in states with weaker enforcement of non-competes.*

3. Data and Methodology

3.1. Data and Variable Definitions

*Inevitable Disclosure Doctrine*

Empirically, it is difficult to estimate how the threat of knowledge spillovers affects companies’ decisions to invest in CSR. For instance, one could regress companies’ CSR on some measure of exposure to knowledge spillovers. Yet, such regression is subject to a classic endogeneity problem, i.e. unobservable firm characteristics may drive a spurious relationship between the two. For example, it could be that management quality—which is difficult to observe—drives both CSR decisions and knowledge workers’ propensity to stay at their company. Moreover, a potential correlation between CSR and exposure to knowledge spillovers could be subject to reverse causation. For example, it could be that companies face an increased exodus of knowledge workers because they engage them in pro bono work. To rule out these and other potential alternative explanations, it is necessary to leverage a research design that provides exogenous shifts in the threat of knowledge spillovers—such exogenous shifts would allow us to estimate the causal effect of the threat of knowledge spillovers on firms’ strategic use of CSR. The specific source of exogenous variation we exploit in this paper is the rejection of the inevitable disclosure doctrine.

The inevitable disclosure doctrine prevents employees with valuable know-how from working for a competitor in the immediate future as they would ‘inevitably disclose’ their current employer’s trade secrets. A “trade secret” is information or knowledge—which may include a formula, pattern, compilation, program, device, method, technique, or process—that is i) not generally known; ii) cannot be
easily figured out by those who want to know it; iii) derives actual or potential economic value (because it is not broadly known); and iv) requires reasonable efforts to keep it from becoming broadly known (see, e.g., Kahnke and Bundy 2013). Trade secrets can range from high-tech information—such as chemical formulas, manufacturing techniques, product design, and technical data—to relatively low-tech information—such as customer lists, business leads, marketing strategies, pricing schedules, and sales techniques—and account for a substantive part of firms’ intangible assets (Thomas 2014). On average, trade secrets are estimated to make up two-thirds of the value of firms’ intangible assets, and up to 80% for companies in knowledge-intensive sectors. In absolute terms, this translates into an estimated $5 trillion worth of trade secrets for publicly traded U.S. companies (U.S. Chamber of Commerce 2014). Precisely because of their value, trade secrets are prone to misappropriation, which most often involves insiders—typically employees or contractors—who are given access to sensitive information (Economist 2013). The rise of computer technology, ubiquity of cell phones, and the Internet have made misappropriating trade secrets easier and, conversely, increased the managerial difficulty of keeping trade secrets safe (Thomas 2014). Indeed, researchers have found that the value of trade secrets is particularly high in industries where the rate of inter-firm mobility is high (Castellaneta, Conti, and Kacperczyk 2015).

A number of legal tools aim to mitigate the risk of trade secret disclosure and imitation by rival firms: U.S. patent law, the Uniform Trade Secret Act, non-compete covenants, and the doctrine of inevitable disclosure. The latter, much like a non-compete covenant, severely restricts the mobility of employees in order to protect companies from unintended knowledge spillovers and economic losses. Yet, unlike non-compete covenants and other legal tools, the inevitable disclosure doctrine does not require i) a specific contract signed by employees, nor ii) an actual misappropriation of confidential information. The mere possibility of trade secret disclosure is sufficient for this doctrine to apply.

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3 By its very nature, information disclosed in a published patent is not a secret anymore. Yet, patent law grants the patent holder the exclusive right to exclude others from making, using, importing, and selling the patented innovation for a limited period of time (see United States Code Title 35 U.S.C.A. § 154(a)).
In inevitable disclosure cases, courts issue an injunction prohibiting the employee from going to work for a competitor. The case in point is PepsiCo, Inc. v. Redmond, 54 F.3d 1262 (7th Cir. 1995):

While in upper management at PepsiCo, Redmond signed a confidentiality agreement but not a non-compete agreement. After he left PepsiCo for a similar job at Quaker, PepsiCo sought to enjoin him from assuming his duties or divulging trade secrets, which concerned mainly strategic sales, marketing, logistics and financial information. Considering the similarity of positions, competitive landscape, timing of departure, and Redmond’s previous work conduct, the court ruled that Redmond’s new employment “would inevitably lead him to disclose trade secrets.” (See, e.g., Kahnke and Bundy (2013) for further details.)

As this case illustrates, the inevitable disclosure doctrine provides employers with a legal tool to prevent employees from working for another company without proving that the individual disclosed any trade secret or even threatened to do so. As such, this doctrine provides employers with a mechanism to severely restrict knowledge workers’ mobility and hence knowledge spillovers (e.g., Gilson 1999, Kahnke and Bundy 2013, Png and Samila 2015).

In this study, we focus on the rejection of the inevitable disclosure doctrine by U.S. states. This rejection occurs when a state court rules that the doctrine is not enforceable in the state. By rejecting the doctrine, states remove an important mobility restriction for workers with valuable skills and knowledge, and hence facilitate knowledge appropriation by rivals. Since the rejection of the inevitable disclosure doctrine does not reflect any firm’s strategic decision, it offers plausibly exogenous variation in a firm’s exposure to knowledge spillovers. This allows us to test whether companies react to an increased threat of knowledge spillovers by strategically increasing their CSR engagement. By the year 2014, a total of 16 states in the U.S. had rejected the inevitable disclosure doctrine. Table 1 lists all 16 states along with the rejection years. This list is adapted from Kahnke, Bundy, and Liebman (2008) and Kahnke and Bundy (2013), and is updated with recent court rulings.4

4 We are grateful to lawyers Randall Kahnke, Kerry Bundy, and Ken Liebman from the trade secret practice of Faegre Baker Daniels LLP for sharing their insights on the inevitable disclosure doctrine.
In the ideal experiment, states would “randomly” reject the inevitable disclosure doctrine. In reality, however, rejecting the doctrine is not random—it may depend on, e.g., changes in economic conditions and political pressures (see Kahnke and Bundy 2013). These, in turn, may affect firms’ decisions to invest in CSR. In the methodology section, we discuss the political economy of the “treatments” and describe how our difference-in-differences specification helps address this potential issue.

Data Sources and Sample Selection

To construct our sample, we merge the KLD database with Standard & Poor’s Compustat. The KLD database contains annual ratings of companies’ social and environmental performance from 1991-2013; Compustat contains accounting information and additional firm-level information (such as industry classification, state of location, etc.) for U.S. public companies. We exclude observations with missing accounting information, as well as companies located outside of the U.S. Using these selection criteria, we obtain a final sample of 30,216 firm-year observations from 1991-2013.

Dependent Variable

The CSR data are obtained from the KLD database. KLD is an independent social choice investment advisory firm that compiles ratings on the extent to which companies address the needs of their stakeholders. For each stakeholder group, strengths and concerns are measured to evaluate positive and negative aspects of corporate actions toward stakeholders. These ratings are compiled from multiple data sources, including annual questionnaires sent to companies’ investor relations offices, firms’ financial statements, annual and quarterly reports, general press releases, government surveys, and academic publications (see KLD 2010). KLD ratings are widely used in CSR studies (e.g., Berman et al. 1999, Deckop, Merriman, and Gupta 2006, Hillman and Keim 2001, Waddock and Graves 1997).

We consider all CSR strengths with respect to employees, customers, the natural environment, and society at large (community and minorities). We then construct a composite KLD-index by adding up
the number of CSR strengths along these dimensions.\footnote{In addition to CSR strengths, the KLD data also contain a list of CSR concerns. Thus, an alternative approach is to construct a “net” KLD-index by subtracting the concerns from the strengths. However, several studies suggest that this approach is methodologically questionable. Because KLD strengths and concerns lack convergent validity, using them in conjunction does not provide a valid measure of CSR (e.g., Kacperczyk 2009, Mattingly and Berman 2006). For this reason, our analysis relies on the composite index of KLD strengths.}

**Control Variables**

In our analysis, we control for a set of firm-level characteristics that may affect a firm’s social engagement, all of which are obtained from Compustat. \textit{Size} is the natural logarithm of the book value of total assets. \textit{Return on assets} (ROA) is the ratio of operating income before depreciation to the book value of total assets. \textit{Tobin’s Q} is the ratio of the market value of total assets (obtained as the book value of total assets plus the market value of common stock minus the sum of the book value of common stock and balance sheet deferred taxes) to the book value of total assets. \textit{Leverage} is the ratio of debt (long-term debt plus debt in current liabilities) to the book value of total assets. \textit{Cash holdings} is the ratio of cash and short-term investments to the book value of total assets. To mitigate the impact of outliers, all ratios are winsorized at the 1\textsuperscript{st} and 99\textsuperscript{th} percentiles of their empirical distribution.

**Summary Statistics**

In Table 2, we present descriptive statistics for the variables used in this paper, as well as the corresponding correlation matrix. We note the positive correlation between the KLD-index and firm size (51.1\%), which underlines the need to control for size in our regressions.

-----Insert Table 2 about here-----

3.2. Methodology

**Difference-in-Differences**

To examine whether firms increase their CSR following the rejection of the inevitable disclosure doctrine,
we use a difference-in-differences methodology based on the 16 treatments listed in Table 1. Our methodology follows Bertrand and Mullainathan’s (2003) application of the difference-in-differences methodology in the presence of staggered treatments at the state level. Specifically, we estimate the following regression:

\[ KLD_{ist} = \alpha_i + \alpha_t + \beta \times IDD_{st} + \gamma'X_{ist} + \epsilon_{ist}, \]

where \( i \) indexes firms; \( t \) indexes years; \( s \) indexes states; \( \alpha_i \) and \( \alpha_t \) are firm and year fixed effects, respectively. Note that state fixed effects are subsumed by the firm fixed effects and hence need not be included. Accordingly, any unobserved heterogeneity at the state level (e.g., whether a state adheres to the Uniform Trade Secret Act (UTSA), the state’s political leaning, etc.) is absorbed by \( \alpha_i \). \( KLD \) is the dependent variable of interest. \( IDD \) is the “treatment dummy”—i.e., a dummy variable that equals one if the company is located in a state that has rejected the inevitable disclosure doctrine by year \( t \). \( X \) is the vector of control variables, which includes size, ROA, Tobin’s Q, leverage, and cash holdings. \( \epsilon \) is the error term. The regression is estimated by Ordinary Least Squares (OLS). We account for serial correlation of the error term by clustering standard errors at the state of location. The coefficient of interest is \( \beta \), which measures the effect of the rejection of the inevitable disclosure doctrine on firms’ CSR. Hypothesis 1 predicts that \( \beta \) should be positive and significant.

We can illustrate our identification strategy with a simple example. Suppose we want to measure the effect of Maryland’s 2004 rejection of the inevitable disclosure doctrine on firms’ CSR practices. We

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6 Since KLD data are only available until 2013, North Carolina’s rejection of the inevitable disclosure doctrine in 2014 is not within the final sample period. Similarly, Louisiana’s rejection of the inevitable disclosure doctrine dates back to 1967, which precedes our sample period and hence does not contribute to the estimation of the treatment effect.

7 The inevitable disclosure doctrine applies at the state of location (as opposed to the state of incorporation). Following common practice in the literature, we use the state of location provided in Compustat (e.g., Bebchuk and Cohen 2003, Coval and Moskowitz 1999, Ivković and Weisbenner 2005). Doing so raises two measurement issues. First, the state of location in Compustat is the state where the company’s headquarters are located. If some of the company’s facilities are located in a different state, then employees at those facilities are subject to a different legal regime. Nevertheless, such mismeasurement would merely attenuate our results and hence go against us finding any effect. Moreover, in robustness checks, we show that our results are robust if we restrict the sample to a subset of firms that are “geographically concentrated” (see Section 4.2). Second, Compustat only records the state of location for the latest available year. Fortunately, headquarters relocations are fairly rare (see, e.g., Pirinsky and Wang 2006). Hence, this caveat is unlikely to matter for our results.
would compute the difference in the KLD-index post-2004 versus pre-2004 for companies located in Maryland (“treated firms”). Yet, other events may have happened around 2004, potentially influencing firms’ social engagement. For example, there may have been an economy-wide boom that translates into higher profits and hence more resources available to invest in CSR after 2004. To account for such contemporaneous effects, we use a control group. For example, we could look at firms located in Pennsylvania (“control firms”) and compute the corresponding difference in the KLD-index post-2004 versus pre-2004 (Pennsylvania did not reject the doctrine). Computing the difference between these two differences provides an estimate of the effect of Maryland’s 2004 rejection of the inevitable disclosure doctrine on the KLD-index, controlling for contemporaneous changes in the KLD-index that are due to changes in economic conditions. The difference between this example and our regression specification is that the latter accounts for the fact that the rejection of the inevitable disclosure doctrine is staggered over time across states. It follows that the composition of both the treatment and control groups changes over time as more states are progressively treated.

3.3. Validity of the Identification Strategy

Our identification strategy needs to satisfy two requirements to be valid, i.e. the relevance condition and the exclusion restriction. First, the treatment (i.e., the rejection of the inevitable disclosure doctrine) needs to trigger relevant changes in the threat of employee mobility and knowledge spillovers. Second, the treatment needs to be exogenous with respect to CSR. In the following, we discuss both requirements.

Relevance Condition

The rejection of the inevitable disclosure doctrine does not necessarily lead to an actual change in employees’ behavior. To satisfy the relevance condition, this event needs to bring about relevant changes in employees’ propensity to leave the company and hence in the risk of knowledge spillovers.

Extant literature suggests that this is indeed the case (e.g., Gilson 1999, Kahnke and Bundy 2013, Png and Samila 2015). In particular, Png and Samila (2015) show that companies located in states that
have rejected the inevitable disclosure doctrine experience a 10% increase in mobility of knowledge workers. This effect is comparable to—in fact, slightly stronger than—the effect of the rejection of non-compete agreements on knowledge workers’ mobility. For example, Marx et al. (2009) find an 8% increase in inventors’ mobility following Michigan’s rejection of non-compete agreements. Overall, this indicates that the rejection of the inevitable disclosure doctrine triggers a substantial increase in knowledge workers’ mobility.

Exclusion Restriction

Our identification strategy assumes that the rejection of the inevitable disclosure doctrine is exogenous with respect to firms’ CSR practices. In the following, we discuss potential identification concerns and explain how our difference-in-differences specification helps address them.

Lobbying. A potential concern is that firms may lobby for the rejection of the inevitable disclosure doctrine, and hence the treatment would reflect a firm’s choice. For instance, if firms that are considerate of their stakeholders’ interests—that is, firms with high CSR—tend to (successfully) pressure courts to reject the doctrine, then our results would be driven by reverse causation. Nevertheless, this concern is mitigated for the following reasons. First, we search for qualitative evidence that would be indicative of this possibility. In particular, we search the Lexis-Nexis database for press releases mentioning that social responsible firms actively advocated the rejection of the doctrine. Not surprisingly, we find no such evidence. Second, to further rule out potential reverse causality concerns, we examine the dynamics of the treatment effect. If reverse causation explains our results, then we would expect that the rejection of the inevitable disclosure doctrine has a positive and significant “effect” already before the rejection occurs. However, we find no evidence for such pre-existing trends. Changes in CSR appear only after (not before or contemporaneous with) the rejection of the doctrine (see Section 4.1 and Figure 1).

Unobserved differences between treated and control firms. Another potential concern is that treated and control firms may differ along unobservable characteristics, and that these differences may correlate with both CSR decisions and states’ rejection of the inevitable disclosure doctrine. Nevertheless,
this concern is unlikely to explain our results, for several reasons. First, as discussed above, we find no
evidence of pre-existing trends. This suggests that treated and control firms are on similar trends prior to
the treatment. Second, to address the potential concern that omitted local trends may confound our results,
we re-estimate our baseline specification including region by year fixed effects, thus controlling for any
regional macro-economic trends (e.g., regional economic booms), that may correlate with the rejection of
the inevitable disclosure doctrine.\footnote{We partition the U.S. according to the nine Census regions (Pacific, Mountain, West North Central, East North Central, West South Central, East South Central, South Atlantic, Middle Atlantic, and New England). Note that we cannot include state by year fixed effects since the treatment is at the state-year level.} We find that our results are robust to this inclusion (see Section 4.2).
Third, given the staggered nature of the treatments, the eventually treated firms are first in the control
group, and only later in the treatment group (i.e., once they have been treated). This feature allows us to
re-estimate our difference-in-differences specification using only the eventually treated firms—which
means that the control group consists only of firms that are eventually treated (for a similar test, see
Bertrand and Mullainathan 2003, Flammer and Kacperczyk 2015). When re-estimating our baseline
specification using only the eventually treated firms, we find that our results are robust (see Section 4.2).
Fourth, our results on the cross-sectional heterogeneity further mitigate concerns that our results may be
driven by unobservables. Indeed, for our results to be spurious, the unobservable would need to be both
correlated with the treatment \textit{and} systematically related to R&D-intensity, distance from hubs, etc. (see
Section 4.3), which seems highly unlikely.

4. Results

4.1. Main Results

The main results are presented in Table 3. In all regressions, the dependent variable is the KLD-index. In
column (1), the regression includes the treatment dummy ($IDD$), as well as firm and year fixed effects. In
column (2), we further include control variables. As can be seen, the coefficient of the treatment dummy
is very stable across both specifications. More specifically, it lies between 0.258 and 0.261 and is always
statistically significant. This implies that the rejection of the inevitable disclosure doctrine leads firms to increase their CSR by about 0.26 KLD strengths—loosely speaking, this means that companies are implementing an additional 0.26 CSR initiatives. This effect may seem small in absolute terms, yet it is quite sizeable in relative terms. Since the average number of KLD strengths is 1.357 (see Table 2), it implies that companies increase their CSR by 19% following the rejection of the inevitable disclosure doctrine. These findings indicate that companies respond to the increased threat of knowledge spillovers by increasing their social engagement, which lends support to Hypothesis 1.

In column (3), we inspect the dynamics of the treatment effect. To do so, we replace the treatment dummy with a set of four dummy variables indicating the year prior to the treatment (IDD (–1)), the year of the treatment (IDD (0)), the first year after the treatment (IDD (1)), and two or more years after the treatment (IDD (2+)). As is shown, the coefficient of IDD (–1) is small and insignificant, which confirms that there is no pre-existing trend in the data. The coefficient of IDD (0) is insignificant as well, that is, there is no effect in the year of the treatment either. In fact, as shown by the positive and statistically significant coefficient of IDD (1), it is only in the first year after the treatment that the effect becomes large and significant. This suggests that it takes about 12 to 24 months for the increased threat of knowledge spillovers to translate into improved CSR practices. Finally, the coefficient of IDD (2+) remains large and significant, which indicates that the increased threat of knowledge spillovers has a long-lasting effect on companies’ social engagement.

-----Insert Table 3 about here------

In Figure 1, we illustrate the dynamics of the treatment effect by plotting the average KLD-index in the treatment group minus the average KLD-index in the control group three years before and after the rejection of the inevitable disclosure doctrine (the 95% confidence interval is reported within dashed lines). As can be seen, the pattern in Figure 1 mirrors the pattern in column (3) of Table 3—there is no pre-trend, the effect comes with a lag of 12 to 24 months, and it is somewhat persistent over time.
4.2. Robustness

In this section, we present various robustness checks and extensions of our baseline analysis. The baseline specification is the one used in column (2) of Table 3, unless otherwise specified.

*Accounting for industry trends.* In column (1) of Table 4, we augment our baseline specification by including industry by year fixed effects (where industries are partitioned according to 2-digit SIC codes). Doing so accounts for any time-varying industry effects that may affect both companies’ CSR and states’ rejection of the inevitable disclosure doctrine. As is shown, our results are robust to this inclusion.

*Accounting for regional trends.* In column (2) of Table 4, we address the potential concern that regional macroeconomic trends (e.g., regional economic booms) may affect our results. Specifically, we augment our baseline specification by including region by year fixed effects (where regions are partitioned according to the nine Census regions). Doing so accounts for any time-varying regional effects that may drive a spurious relationship between companies’ CSR and states’ rejection of the inevitable disclosure doctrine. As is shown in column (2), our results are robust to this inclusion.

*Eventually treated companies.* As discussed above, a potential concern is that unobserved differences between treated and control firms may affect our results. To address this concern, we take advantage of the staggering of the treatments and re-estimate our baseline specification using only the subsample of eventually treated firms. As can be seen from column (3) of Table 4, our estimate of the treatment effect remains similar, which implies that our findings are not driven by unobserved differences between firms located in treated and control states.

*Geographically concentrated firms.* The inevitable disclosure doctrine applies in the state in which the employee works, whereas our analysis is based on the state in which the company’s headquarters is located. For companies that have operations outside of the headquarters’ state, this
mismatch may attenuate our estimate of the treatment effect. To address this issue, we use the data of Garcia and Norli (2012) on state-level operations of companies based on their 10-K filings. Specifically, we identify a subset of “geographically concentrated firms,” that is, firms with at least 80% of their operations in their headquarters state. We then re-estimate our baseline specification using this subsample of firms. As is shown in column (4) of Table 4, our results also hold in this subsample. As expected, the point estimate is larger than in the full sample.

**Serial correlation.** In their assessment of the difference-in-differences methodology, Bertrand, Duflo, and Mullainathan (2004) recommend that standard errors be clustered at the dimension of the treatment. Accordingly, in our baseline specification, we cluster standard errors at the state of location. In column (5) of Table 4, we consider an alternative method proposed by Bertrand, Duflo, and Mullainathan (2004): block bootstrapping. The difference to standard bootstrapping is that instead of drawing single observations, we draw entire groups (“blocks”) of observations. The idea, which is similar to clustering, is to preserve the existing correlation structure within each block while using the independence across blocks to consistently estimate standard errors. In analogy to our clustering approach, we construct blocks at the state level. Specifically, we construct 100 bootstrap samples by drawing with replacement states of location. For each bootstrap sample, we estimate our baseline specification and store the coefficients. The standard errors are then calculated based on the empirical distribution of these 100 sets of coefficients. As is shown in column (5) of Table 4, the significance level is very similar to before.

**Excluding employee-related CSR.** The core argument of our theory is that firms respond to an increased threat of knowledge spillovers by improving their social responsible practices with respect to their various stakeholders. To ensure that our results are not merely driven by employee-related CSR, we construct an alternative KLD-index in which we exclude employee-related KLD strengths (i.e., “diversity” and “employees”). As is shown in column (6), our results are robust to this exclusion.

**4.3. Auxiliary Analyses**

In this section, we refine our analysis by interacting the treatment dummy (IDD) with cross-sectional
characteristics. This allows us to examine potential mechanisms underlying the relationship between the rejection of the inevitable disclosure doctrine and firms’ CSR practices.  

**R&D intensive industries.** Our findings suggest that firms employ CSR as a strategic tool to counter the threat of knowledge spillovers. Arguably, this threat is more severe in R&D intensive industries, where companies’ competitiveness is more likely to depend on their innovative capabilities. Accordingly, we expect a stronger treatment effect in R&D intensive industries. We examine this mechanism in column (1) of Table 5 by interacting \( IDD \) with a dummy variable indicating whether the company operates in an R&D intensive industry. Specifically, we construct a measure of R&D intensity at the industry level by computing the average ratio of R&D expenses to total assets across all Compustat firms in the same 2-digit SIC industry. We then code an industry as R&D intensive if this ratio lies above the median across all industries in the year prior to the treatment (\( \text{high R&D industry} \)). As is shown, we find that the treatment effect is indeed significantly larger for companies in R&D intensive industries.

\[ \text{-----Insert Table 5 about here-----} \]

**Proximity to innovation hubs.** Our arguments suggest that firms react to an increased threat of knowledge spillovers by increasing their CSR. This threat is likely more severe for companies located in close proximity to innovation hubs (for a related argument see, e.g., Almeida and Kogut 1999, Mariani et al. 2015). Hence, we expect the treatment effect to be stronger for such companies. To examine this mechanism, we compute the great-circle distance between the ZIP code of the company’s headquarters (from Compustat) and the three innovation hubs—Palo Alto, New York City, and Boston. The great-circle distance is the shortest distance between any two points on the surface of a sphere and is obtained from the formula:

\[ r \times \text{arccos} \left[ \sin(\lambda_i) \times \sin(\lambda_{\text{hub}}) + \cos(\lambda_i) \times \cos(\lambda_{\text{hub}}) \times \cos(\theta_i - \theta_{\text{hub}}) \right], \]

\[ 9 \] A caveat of this analysis is that we do not have exogenous variation in the cross-sectional characteristics of interest. In other words, they may correlate with other variables. Hence, while informative, the results presented in this section are only suggestive and do not necessarily warrant a causal interpretation.

\[ 10 \] Since \( \text{high R&D industry} \) is a time-invariant characteristic, we do not include it as standalone in the regression (it would be absorbed by the firm fixed effects). The same applies to the other interaction terms used in Table 5, except for the non-compete index described below.

\[ 11 \] The great-circle distance is the shortest distance between any two points on the surface of a sphere and is obtained from the formula:
interact \( IDD \) with a dummy variable indicating whether the company is located within 100 miles of any of those innovation hubs. As can be seen from column (2) of Table 5, we find that the treatment effect is indeed significantly larger for companies in close proximity to innovation hubs.

**Product market competition.** Our findings suggest that companies increase their CSR when faced with an increased threat of knowledge spillovers. Doing so is likely more important in a competitive environment where it is vital for firms to retain knowledge. Hence, we expect the increase in CSR to be stronger for firms in more competitive industries. We examine this mechanism in column (3) of Table 5 by interacting \( IDD \) with a dummy variable indicating whether the company operates in an industry where product market competition is above the median across all industries in the year preceding the treatment (high competition). We measure competition by using the Herfindahl-Hirschman Index (HHI) of industry concentration at the 2-digit SIC level.\(^{12}\) Consistent with the above prediction, we find that the treatment effect is significantly larger for companies operating in more competitive industries.

**Investment opportunities.** The prospect of better investment opportunities is conducive to both employee entrepreneurship and aggressive employee poaching by rival firms (e.g., *Businessweek* 2000, *New York Times* 2015). Accordingly, we expect CSR as a strategic tool to be especially relevant for firms operating in industries with more attractive investment opportunities. To examine this mechanism, we construct a measure of investment opportunities at the industry level by computing the average Tobin’s Q across all companies in the same 2-digit SIC industry. We then interact the treatment dummy (\( IDD \)) with a dummy variable indicating whether the company operates in an industry whose Tobin’s Q is above the median across all industries in the year preceding the treatment (high investment opportunities). As is

where \( \lambda_{i} (\theta_{i}) \) is the latitude (longitude) of the ZIP code of company \( i \)'s headquarters, and \( \lambda_{hub} (\theta_{hub}) \) is the latitude (longitude) of the centroid of Palo Alto, New York City, and Boston, respectively. We match ZIP codes to longitudes and latitudes using the ‘zipcode’ file of the SAS software. We approximate the latitude and longitude of Palo Alto by taking the average latitude and longitude of all Palo Alto ZIP codes listed in the ‘zipcode’ file of the SAS software. We proceed similarly for New York City and Boston.\(^{12}\) HHI is defined as the sum of the squared market shares of all companies in the same industry. We use sales data from Compustat to compute market shares. Note that HHI is a measure of concentration, and hence an inverse measure of competition.

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\(^{12}\) HHI is defined as the sum of the squared market shares of all companies in the same industry. We use sales data from Compustat to compute market shares. Note that HHI is a measure of concentration, and hence an inverse measure of competition.
shown in column (4) of Table 5, and consistent with our prediction, we find that the treatment effect is significantly larger for companies operating in industries with more attractive investment opportunities.

**Non-compete agreements.** Finally, we expect our results to be weaker in states that strongly enforce non-compete agreements. Indeed, non-compete agreements restrict knowledge workers’ mobility, and hence attenuate the risk of knowledge spillovers arising from the rejection of the inevitable disclosure doctrine. In column (5) of Table 5, we interact $IDD$ with Garmaise’s (2009) index of enforceability of non-compete agreements at the state level ($non-compete index$). As is shown, the treatment effect is indeed smaller in states with a higher value of the index. The coefficient of the interaction term is marginally insignificant, though.

5. Discussion and Conclusion

How do firms respond to the risk of knowledge spillovers? Answering this question is at the very core of strategic management and has important implications for innovation, entrepreneurship, and strategic human capital. While the limelight of scholarly attention has been on legal mechanisms and pecuniary tools, the use of relationship-based practices to retain valuable employee know-how has remained largely unexplored. In this paper, we aim to make ground on this question.

We argue that social responsible practices can help firms manage knowledge workers’ perception of their current job and counter the threat of knowledge spillovers in several ways. First, by addressing the needs of their various stakeholders, firms can mitigate employees’ concerns and likely enhance the overall reputation of the firm as a workplace. Moreover, stakeholder orientation provides a work environment that is conducive to knowledge creation and innovation (Flammer and Kacperczyk 2015), which likely further increases a firm’s attractiveness as a workplace for knowledge workers. Second, job-related CSR business practices may improve the attractiveness of the work content, allowing employees to have (direct or indirect) social and environmental impact. Third, companies’ CSR practices may strengthen employees’ social ties and identification with the firm, which likely enhances their loyalty to the firm. In sum, firms’ CSR practices can improve employees’ perception of their current job and hence
mitigate the risk that knowledge workers take their valuable knowledge to rival firms. Accordingly, we propose that companies strategically increase their CSR when faced with an increased threat of knowledge spillovers.

To examine this question empirically, we exploit a quasi-natural experiment provided by the rejection of the inevitable disclosure doctrine by several U.S. states. This doctrine prohibits employees with valuable know-how from working for a competitor in the near future since they would inevitably disclose their current employer’s trade secrets. As such, the inevitable disclosure doctrine severely constrains knowledge workers’ mobility and hence mitigates the risk of knowledge spillovers (e.g., Gilson 1999, Png and Samila 2015). Conversely, the rejection of this doctrine leads to an increase in the risk of knowledge spillovers. Accordingly, by focusing on the rejection of the inevitable disclosure doctrine, we are able to test whether companies strategically increase their CSR in response to the increased risk of knowledge spillovers.

We find that companies react to the rejection of the inevitable disclosure doctrine by significantly increasing their engagement in CSR. Furthermore, we document that the increase in CSR is stronger for companies that are i) located closer to innovation hubs as well as companies operating in industries that are ii) more R&D intensive, iii) more competitive, and iv) have more attractive investment opportunities. Overall, these findings suggest that CSR is strategically used to counter the risk of knowledge spillovers.

To the best of our knowledge, our study is the first to examine whether companies respond to the increased threat of knowledge spillovers by strategically improving their CSR. This study contributes to the academic literature in several ways. First, it relates to the large body of work in management, economics, and psychology that examines how companies address the threat of losing valuable human capital and know-how. In particular, a vibrant literature studies the impact of legal mechanisms—such as non-compete covenants, patent enforcement, and the inevitable disclosure doctrine—on employee mobility (e.g., Ganlo et al. 2015, Marx 2011, Marx et al. 2009, Png and Samila 2015) as well as knowledge spillovers and imitation by rival firms (e.g., Agarwal et al. 2009, Kim and Marschke 2005). Absent such legal tools, however, companies need to find alternative ways to retain their employees with
valuable skills and knowledge. Our study expands the existing literature and indicates that, absent legal mechanisms, CSR practices can serve as a strategic management tool to mitigate the risk of knowledge spillovers.

Second, by combining research on employee mobility with research on strategic human capital, we follow Agarwal et al.’s (2014) call to expand our understanding of the relationship between individual-level decision making and firm-level mechanisms. In particular, we contribute to the few but notable studies (e.g., Campbell, Coff, and Kryscynski 2012) that theoretically integrate labor markets’ demand and supply side factors, and link general human capital (as opposed to firm-specific human capital) to sustained competitive advantage.

Third, by identifying a management practice—specifically, firms’ social responsible practices—that does not rely on pecuniary incentives to retain employees, we contribute to the literature on employee governance (e.g., Gallus and Frey 2015, Gubler, Larkin, and Pierce 2015, Larkin and Pierce 2015). In contrast to relationship-based practices, pecuniary incentives have been widely studied in the literature, with many scholars (e.g., Akerlof and Kranton 2005, Gibbons 1998, Larkin and Pierce 2015, Prendergast 1999) pointing at the drawbacks of pecuniary incentives and the need to go beyond them.

Fourth, we contribute to the burgeoning literature that tries to understand the internal and external drivers of CSR activities, such as regulatory institutions (e.g., Fabrizio 2012, Flammer 2015b, Toffel, Short, and Ouellet 2015), the community (e.g., Tilcsik and Marquis 2013), activists (e.g., Baron 2009, Baron and Diermeier 2007, McDonnell and King 2013, Zhang and Luo 2013), shareholders (e.g., Flammer 2015a), and employees (e.g., Bode et al. 2015, Burbano 2016, Burbano et al. 2013, Carnahan et al. 2015, Flammer and Luo 2015). This paper focuses on employees with valuable skills and knowledge—a key source of the firm’s ability to innovate and sustain its competitive advantage—and suggests that firms strategically increase their CSR when faced with an increased risk of knowledge spillovers.

Our findings have potentially important managerial implications as failing to retain employees with valuable skills and knowledge can lead to inter-firm knowledge spillovers (Agarwal, Ganco, and
Ziedonis 2009, Almeida and Kogut 1999, Rosenkopf and Almeida 2003), declines in explorative and path-breaking R&D projects (Conti 2014), and may ultimately undermine the competitive advantage of the focal firm (Campbell et al. 2012).

Finally, our study calls for future research. Our findings indicate that companies respond to the increased threat of knowledge spillovers by strategically increasing their CSR. A related question is whether such practices are indeed effective. In other words, is it the case that firms engaged in CSR are less likely to lose knowledge to their competitors? Making grounds on this question is an exciting avenue for future work. While our study takes the first step in indicating that social responsible practices are strategically used to retain valuable knowledge, more research is needed to establish the effectiveness of such practices.

References


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Table 1. Rejection of the Inevitable Disclosure Doctrine

<table>
<thead>
<tr>
<th>State</th>
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### Table 2. Summary Statistics

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<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
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<td>2.208</td>
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<td>1.742</td>
<td>0.118</td>
<td>0.137</td>
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<td>0.274</td>
<td>0.001</td>
<td>-0.183</td>
<td></td>
</tr>
<tr>
<td>5 Leverage</td>
<td>30,216</td>
<td>0.216</td>
<td>0.199</td>
<td>-0.092</td>
<td>-0.434</td>
<td>-0.320</td>
<td>0.466</td>
<td>-0.331</td>
</tr>
</tbody>
</table>

*Notes. The sample includes all firm-year observations for companies in the merged KLD-Compustat sample from 1991-2013.*
Table 3. Main Results

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>KLD-index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>IDD</td>
<td>0.258**</td>
</tr>
<tr>
<td></td>
<td>(0.126)</td>
</tr>
<tr>
<td>IDD (-1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>IDD (0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>IDD (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>IDD (2+)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.190**</td>
</tr>
<tr>
<td></td>
<td>(0.072)</td>
</tr>
<tr>
<td>ROA</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td>(0.167)</td>
</tr>
<tr>
<td>Tobin's Q</td>
<td>-0.020</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.265</td>
</tr>
<tr>
<td></td>
<td>(0.164)</td>
</tr>
<tr>
<td>Cash</td>
<td>0.491***</td>
</tr>
<tr>
<td></td>
<td>(0.165)</td>
</tr>
<tr>
<td>Firm fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.750</td>
</tr>
<tr>
<td>Observations</td>
<td>30,216</td>
</tr>
</tbody>
</table>

Notes. Standard errors, clustered at the state level, are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.
Table 4. Robustness

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Accounting for industry trends</th>
<th>Accounting for regional trends</th>
<th>Eventually treated firms</th>
<th>Geographically concentrated firms</th>
<th>Block-bootstrapped standard errors</th>
<th>Excluding employee-related KLD provisions</th>
<th>KLD-index</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDD</td>
<td>0.230**</td>
<td>0.180**</td>
<td>0.276**</td>
<td>0.809**</td>
<td>0.261**</td>
<td>0.132***</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>(0.106)</td>
<td>(0.071)</td>
<td>(0.134)</td>
<td>(0.335)</td>
<td>(0.119)</td>
<td>(0.043)</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.189**</td>
<td>0.168**</td>
<td>0.184*</td>
<td>-0.038</td>
<td>0.190***</td>
<td>0.043</td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td>(0.088)</td>
<td>(0.066)</td>
<td>(0.104)</td>
<td>(0.294)</td>
<td>(0.069)</td>
<td>(0.029)</td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>0.051</td>
<td>0.086</td>
<td>0.146</td>
<td>0.585</td>
<td>0.050</td>
<td>-0.004</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>(0.162)</td>
<td>(0.150)</td>
<td>(0.298)</td>
<td>(0.547)</td>
<td>(0.169)</td>
<td>(0.063)</td>
<td></td>
</tr>
<tr>
<td>Tobin’s Q</td>
<td>-0.028</td>
<td>-0.019</td>
<td>-0.034</td>
<td>0.054</td>
<td>-0.020</td>
<td>-0.017*</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.022)</td>
<td>(0.024)</td>
<td>(0.055)</td>
<td>(0.023)</td>
<td>(0.010)</td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>0.193</td>
<td>0.267*</td>
<td>0.358*</td>
<td>0.131</td>
<td>0.265*</td>
<td>0.218**</td>
<td>(5)</td>
</tr>
<tr>
<td></td>
<td>(0.130)</td>
<td>(0.147)</td>
<td>(0.193)</td>
<td>(0.937)</td>
<td>(0.154)</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>0.470***</td>
<td>0.445***</td>
<td>0.525**</td>
<td>0.514</td>
<td>0.491***</td>
<td>0.314***</td>
<td>(6)</td>
</tr>
<tr>
<td></td>
<td>(0.162)</td>
<td>(0.170)</td>
<td>(0.197)</td>
<td>(0.624)</td>
<td>(0.168)</td>
<td>(0.066)</td>
<td></td>
</tr>
</tbody>
</table>

Firm fixed effects  Yes      Yes      Yes      Yes                  Yes      Yes      Yes
Year fixed effects   Yes      Yes      Yes      Yes                  Yes      Yes      Yes
Industry-year fixed effects Yes      No       No       No                  No       No       No
Region-year fixed effects No       Yes      No       No                  No       No       No
R-squared            0.778    0.756    0.763    0.911    0.751    0.655
Observations         30,216   30,216   17,142   1,763    30,216   30,216

Notes. Standard errors (reported in parentheses) are clustered at the state level, except in column (5) where they are block-bootstrapped at the state level using 100 bootstrap samples. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.
Table 5. Cross-Sectional Heterogeneity

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>KLD-index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>IDD</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td>(0.115)</td>
</tr>
<tr>
<td>IDD x High R&amp;D industry</td>
<td>0.345**</td>
</tr>
<tr>
<td>IDD x High proximity to innovation hubs</td>
<td>0.388*</td>
</tr>
<tr>
<td>IDD x High competition</td>
<td>0.302*</td>
</tr>
<tr>
<td>IDD x High investment opportunities</td>
<td>0.276*</td>
</tr>
<tr>
<td>IDD x Non-compete index</td>
<td>-0.076</td>
</tr>
<tr>
<td>Size</td>
<td>0.180**</td>
</tr>
<tr>
<td></td>
<td>(0.072)</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.167)</td>
</tr>
<tr>
<td>Tobin's Q</td>
<td>-0.022</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.273</td>
</tr>
<tr>
<td></td>
<td>(0.165)</td>
</tr>
<tr>
<td>Cash</td>
<td>0.512***</td>
</tr>
<tr>
<td></td>
<td>(0.165)</td>
</tr>
<tr>
<td>Non-compete index</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Yes</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.748</td>
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<tr>
<td>Observations</td>
<td>29,241</td>
</tr>
</tbody>
</table>

Notes: Standard errors, clustered at the state level, are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.
Figure 1. Evolution of the KLD-index around the Rejection of the Inevitable Disclosure Doctrine

Notes. The vertical axis plots the average KLD-index in the treatment group minus the average KLD-index in the control group three years before and after the treatments (95% confidence interval within dashed lines). “Treatments” refer to the rejection of the inevitable disclosure doctrine in the 16 states listed in Table 1. The horizontal axis plots the years relative to the treatment (“year 0” refers to the year of the treatment, “year 1” is the year after the treatment, etc.).