

Corporate social responsibility as a defense against knowledge spillovers: Evidence from the inevitable disclosure doctrine

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Research Summary: We examine whether companies respond to the threat of knowledge leakage by strategically increasing their engagement in corporate social responsibility (CSR). To obtain exogenous variation in the threat of knowledge leakage, we exploit a natural experiment provided by the rejection of the inevitable disclosure doctrine (IDD) by several U.S. states. Using a difference-in-differences methodology we find that, following the rejection of the IDD, companies significantly increase their CSR. Our proposed rationale is that CSR helps mitigate knowledge leakage by (i) reducing employees' propensity to join a rival firm, and (ii) reducing employees' propensity to disclose the firm's valuable knowledge even if they join a rival firm. Evidence from a laboratory experiment, an online experiment, and a survey of knowledge workers is supportive of these arguments.

Managerial Summary: We study the role of CSR in companies' response to the threat of knowledge leakage—a major managerial challenge that has important implications for firms' innovation and competitiveness. We use three different research designs (an analysis of companies' CSR policies in response to an increased threat of knowledge leakage; a survey of knowledge workers; and an experiment conducted both online and in a laboratory setting). The results show that CSR is perceived to mitigate the threat of knowledge leakage. In particular, (i) CSR reduces knowledge workers' propensity to join rival firms (i.e., they are less likely to "walk") and, even if they do, (ii) CSR reduces their propensity to disclose the firm's valuable knowledge to their new employer (i.e., they are less likely to "talk").

KEY WORDS

corporate social responsibility, difference-in-differences, inevitable disclosure doctrine, knowledge spillovers, trade secrets

1 | INTRODUCTION

A firm's ability to innovate and adapt to changes in the business environment is essential for firm survival and for sustaining a competitive advantage (e.g., Eisenhardt & Martin, 2000; Helfat et al., 2007; Teece, Pisano, & Shuen, 1997). As such, employee know-how is a key source of sustainable competitive advantage (e.g., Barney, 1991; Hall, 1993). Yet it also represents a major managerial challenge, as employees with valuable knowledge are the most likely ones to walk out the door (Coff, 1997; Ganco, Ziedonis, & Agarwal, 2015; Kacperczyk, 2012; Kacperczyk & Balachandran, 2018), taking their valuable knowledge with them to join rival firms or create new ventures. This may lead to interfirm knowledge spillovers, resulting in a potential leakage of a firm's proprietary knowledge to rivals (Agarwal, Ganco, & Ziedonis, 2009; Almeida & Kogut, 1999; Rosenkopf & Almeida, 2003). Given that these spillovers may undermine a firm's competitive advantage (Campbell, Ganco, Franco, & Agarwal, 2012), understanding how firms respond to such threats is of central importance to strategic management, innovation, and entrepreneurship (for a review, see Agarwal, Gambardella, & Olson, 2014).¹

Despite its importance, the relationship between the risk of losing knowledge to rivals and firm strategy is not well understood. The focus of scholarly attention has been on legal barriers and financial incentives (e.g., Agarwal et al., 2009; Carnahan, Agarwal, & Campbell, 2012; Ganco et al., 2015; Gilson, 1999; Kim & Marschke, 2005; Marx, 2011; Marx et al., 2009), but much less is known about nonpecuniary incentives and their role in mitigating the threat of knowledge appropriation by competitors. This study advances the extant literature by identifying one such strategic response: a firm's engagement in corporate social responsibility (CSR), defined as attention to the interests of nonfinancial stakeholders (Freeman, 1984).²

We propose that firms counter the threat of knowledge leakage by strategically increasing their engagement in CSR. The underlying arguments are that CSR helps mitigate knowledge leakage in two ways: (i) by reducing knowledge workers' propensity to join a rival firm (i.e., they are less likely to "walk" out the door), and (ii) by reducing knowledge workers' propensity to disclose the firm's valuable knowledge *even if they join* a rival firm (i.e., they are less likely to "talk").

We substantiate these arguments by conducting a large-scale survey of knowledge workers. The majority of respondents agreed that CSR helps retain valuable knowledge in these two ways—that is, (i) CSR practices decrease knowledge workers' willingness to join a rival firm, and (ii) even if they

¹A "knowledge spillover" refers to a situation where knowledge is created by one agent and used by another agent without proper compensation for the knowledge producer. In principle, it could be that the previous employer may have paid the employee less in the expectation of such leakage. In keeping with the literature on inventor mobility (e.g., Agarwal et al., 2009; Marx, Strumsky, & Fleming, 2009), we abstract away from this nuance.

²As such, CSR includes any corporate initiative pertaining to the firm's stakeholders, that is, "any group or individual who can affect or is affected by the achievement of an organization's purpose" (Freeman, 1984: 53)—such as employees, customers, the environment, and the community at large—and hence is not limited to philanthropic initiatives. For a similar definition see, for example, Barnett and Salomon (2006), Flammer and Bansal (2017), and Graves and Waddock (2000).

do, CSR practices decrease the risk that they disclose the firm's valuable knowledge to the new employer. Overall, this survey provides supportive evidence for the arguments underlying our prediction that firms anticipate the benefits of CSR for knowledge workers, and use CSR as a strategic tool to counter the threat of knowledge appropriation by rivals.

We then examine whether companies increase their CSR in response to the threat of knowledge spillovers. From an empirical perspective, it is difficult to establish a causal link between the threat of 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 affect both a firm's propensity to increase CSR and its exposure to 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 disclose proprietary knowledge to rivals. 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 staggered 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. By focusing on the *rejection* of the inevitable disclosure doctrine—which weakens the protection of a firm's proprietary knowledge—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 increased their CSR, as measured by the Kinder, Lydenberg, and Domini (KLD) index of CSR performance. This result holds for various types of CSR—including employee-related CSR, as well as CSR related to the environment and society at large. These findings withstand 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 threat of knowledge leakage.

Finally, we supplement our findings with evidence obtained from two experimental vignette studies, one conducted in a laboratory setting, and another conducted on the online labor-sourcing platform Amazon Mechanical Turk. In both experiments, we randomly assigned subjects to hypothetical employers that either engaged or did not engage in CSR practices. Subjects were then told that they moved to a rival firm and faced the decision of whether to disclose their previous employer's valuable knowledge (in the form of a client list). We find that subjects exposed to the CSR treatment (i.e., their previous employer engaged in CSR) were significantly less likely to disclose proprietary knowledge to their new employer. This lends additional support to our argument that CSR reduces employees' propensity to disclose the firm's valuable knowledge upon joining a rival firm.

This study integrates and contributes to several streams of literature. In particular, it highlights a novel mechanism—corporate social responsible practices—that firms use as a defense against knowledge leakage. Moreover, by documenting that the threat of knowledge leakage induces firms to increase their CSR, our study sheds light on an unexplored antecedent of CSR.

2 | HYPOTHESIS DEVELOPMENT

2.1 | Strategic importance of preventing knowledge leakage

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 for sustaining a competitive advantage

(e.g., Eisenhardt & Martin, 2000; Flammer & Ioannou, 2018; Helfat et al., 2007; Teece et al., 1997). Moreover, and in the spirit of the resource-based view of the firm, achieving and sustaining a competitive advantage critically depends on the firm's ability to protect its valuable and rare resources from imitation by competing firms (e.g., Barney, 1991; Mahoney & Pandian, 1992). 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 & Cool, 1989; Grant, 1996; Kogut & Zander, 1992).

Yet, employee know-how that is also of value to competing companies offers no such protective shield, as employees with valuable knowledge can walk out the door to join a rival firm or create a new venture (Coff, 1997; Ganco et al., 2015; Kacperczyk, 2012, 2013; Starr, Balasubramanian, & Sakakibara, 2018), taking their knowledge away from the focal firm to the new employer. Moreover, competing firms may actively poach employees with valuable knowledge to gain access to the focal firm's knowledge sources and technological expertise (*Businessweek*, 2000; Rao & Drazin, 2002; Stern & James, 2016). Both can have dire consequences for the focal firm as they facilitate technological knowledge transfer (e.g., Agarwal et al., 2014; Almeida & Kogut, 1999; Rosenkopf & Almeida, 2003; Song, Almeida, & Wu, 2003) and enhance the rival firm's product innovation (Rao & Drazin, 2002). In sum, the departure of employees whose know-how is also valuable to competing companies—whether rival established firms or entrepreneurial ventures—increases the risk of knowledge leakage and represents a significant threat to the company's competitiveness (Campbell, Ganco, et al., 2012; Wezel, Cattani, & Pennings, 2006). Accordingly, understanding how firms respond to the threat of knowledge leakage lies at the core of strategic management.

2.2 | Companies' strategic responses to the threat of knowledge leakage

The managerial challenge of countering the threat of knowledge leakage has spurred a large literature in management, economics, and psychology. But despite this long research inquiry, little is known about whether firms engage in CSR to counter the risk of knowledge leakage. First, the majority of studies has focused on institutional factors—such as the inevitable disclosure doctrine, noncompete covenants, and patent enforcement. This line of research suggests that institutional barriers play an important role in reducing the threat of knowledge appropriation by rival firms (e.g., Agarwal et al., 2009; Ganco et al., 2015; Gilson, 1999; Kim & Marschke, 2005; Marx, 2011; Marx et al., 2009; Png & Samila, 2015; Starr, Ganco, & Campbell, 2018). Another line of research focuses on firm's use of pecuniary incentives to prevent the loss of valuable knowledge (e.g., Carnahan et al., 2012).³ Finally, a burgeoning literature suggests that firms use nonpecuniary incentives in order to manage knowledge workers. In particular, Gambardella, Khashabi, and Panico (2015) and Gambardella, Panico, and Valentini (2015) highlight the role of autonomy in incentivizing knowledge workers. Relatively, Stern (2004) shows that scientists are less sensitive to monetary incentives, and are even willing to forgo monetary benefits for the discretion in choosing which research projects to pursue.

We complement this body of literature by examining the role of relationship-based initiatives—such as social responsible practices—and propose that firms strategically engage in CSR as a defense against the risk of knowledge appropriation by rival firms. Specifically, we argue that firms respond to an increased threat of knowledge leakage by improving their CSR practices, as such practices are

³For a discussion of the limitations of pecuniary incentives, see Akerlof and Kranton (2005), Gibbons (1998), Larkin and Pierce (2015), Prendergast (1999).

likely to enhance knowledge workers' loyalty and reduce their propensity to disclose valuable knowledge even if they move to a rival firm. In the following, we elaborate on these arguments.

2.3 | The two-fold effect of CSR on knowledge workers: decrease in “walking” and “talking”

In this section, we argue that CSR has a two-fold effect: it mitigates the risk of knowledge leakage by reducing knowledge workers' propensity to (i) join a rival firm (i.e., they are less likely to “walk” out the door), and (ii) disclose the firm's valuable knowledge even if they join a rival firm (i.e., they are less likely to “talk”). Moreover, these effects can operate directly through employee-centered CSR, and indirectly through initiatives focused on other stakeholders (e.g., local communities and the natural environment).

2.3.1 | CSR and knowledge workers' propensity to “walk”

We first turn our attention to the effect of CSR on the risk that knowledge workers leave for a competitor. There is accumulated evidence by now that, by engaging in CSR, firms can reduce employees' concerns and improve the overall reputation of the firm as a workplace. Indeed, recent surveys suggest that the perception of a firm's CSR practices—such as higher environmental management and product standards, philanthropic activities, global citizenship, etc.—is a key driver of how individuals feel about a company and strongly influences their willingness to work for it (*Forbes*, 2013; McKinsey, 2009; Reputation Institute, 2015; World Economic Forum, 2003).⁴ In addition to these reputational benefits, CSR can 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 & Kacperczyk, 2016). This likely augments the firm's attractiveness as an innovative workplace for knowledge workers, and attenuates competitors' ability to poach employees and appropriate valuable know-how.

Relatedly, we argue that CSR practices allow knowledge workers to have a positive impact on society and the natural environment, thereby enhancing knowledge workers' propensity to stay with their current employer. In line with this argument, Bode, Singh, and Rogan (2015) and Carnahan, Kryscynski, and Olson (2017) show that firms that engage their employees in social impact projects and pro bono work are better able to retain them.⁵ Beside engaging employees *directly* in social initiatives—which has been the focus of the extant literature (e.g., Bode et al., 2015; Carnahan et al., 2017)—employers can also allow knowledge workers to have an *indirect* impact on society and the natural environment (e.g., by sourcing from suppliers that comply with fair labor standards, using renewable energy for their production processes, developing environmental-friendly technologies, offering business solutions to underserved communities, promoting social inclusion and a fair work environment, etc.). As such, we argue that CSR (with respect to a wide set of stakeholders) allows knowledge workers to have direct *and* indirect social and environmental impact from which they

⁴Several 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 caliber 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, 2003, p. 19).

⁵Moreover, evidence from the previous literature suggests that firms that engage employees in philanthropic activities and are perceived as being fair and caring are better able to attract employees (e.g., Albinger & Freeman, 2000; Greening & Turban, 2000; Turban & Greening, 1996).

may derive intangible benefits.⁶ Considering the sensitivity of knowledge workers to intangible benefits (e.g., Gambardella, Panico, & Valentini, 2015; Stern, 2004), we expect that—all else equal—these intangible benefits improve knowledge workers' overall appreciation of their current employer and hence positively influence knowledge workers' decision to stay with the firm, thereby decreasing the risk of knowledge leakage.

2.3.2 | CSR and knowledge workers' propensity to "talk"

While the previous arguments focused on firms' efforts to mitigate employees' propensity to "walk," little is known on how to prevent employees from disclosing their previous employer's valuable knowledge upon joining a rival firm. The question of how to decrease employees' propensity to "talk" is especially important when it comes to knowledge workers given that (i) knowledge workers have access to the firm's valuable knowledge, and (ii) their interfirm mobility is higher compared to regular employees (e.g., Ganco et al., 2015; Marx et al., 2009). Therefore, shielding against knowledge leakage also requires that firms reduce knowledge workers' propensity to disclose valuable knowledge in case they do join a competitor.⁷

We argue that CSR practices offer such a strategic tool—that is, a tool that helps reduce knowledge workers' willingness to "talk"—because they enhance workers' social ties and identification with the firm.⁸ The argument that CSR may strengthen knowledge workers' identification with the firm echoes well with the extant literature. In particular, 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, Rupp, Williams, & Ganapathi, 2007) and evaluate whether the firm's attitudes fit with individuals' identity (Kim, Lee, Lee, & Kim, 2010). If they fit, then employees develop a sense of belonging and their actions align with organizational interests as reflected in, for example, stronger organizational commitment and improved citizenship behavior (Flammer & Luo, 2017; Rupp, Ganapathi, Aguilera, & Williams, 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 and job satisfaction (Dimarco, 1975; Jackson et al., 1991; O'Reilly, Caldwell, & Barnett, 1989; O'Reilly & Chatman, 1986). Moreover, in controversial industries, employees show greater organizational trust and identification with their company if it engages in environmental-friendly efforts (De Roeck & Delobbe, 2012). Overall, these studies suggest that CSR practices can strengthen employees' social ties and identification with the firm. Accordingly, we expect that CSR practices strengthen knowledge workers' identification with the firm and, as a result, reduce their willingness to undermine their previous employer.

Furthermore, a large body of work in organizational psychology suggests that employees' organizational justice perception can influence their trust and other individual behaviors towards the organization (Colquitt, Conlon, Wesson, Porter, & Ng, 2001). In this vein, we posit that good corporate

⁶Employee-related CSR initiatives—similar to pecuniary benefits—provide direct benefits to employees. In contrast, CSR initiatives targeted towards other stakeholders do not offer direct benefits but may nevertheless provide indirect, intangible benefits to employees.

⁷In contrast, other employees do not have access to a firm's trade secrets and hence keeping them from talking is of lesser importance. This may explain why the extant CSR literature has focused on employee retention as opposed to the knowledge itself and, more specifically, knowledge workers' propensity to "talk" after parting from their previous employer.

⁸Note that the arguments provided in this section are interrelated, as the previous two arguments—CSR improving (i) the firm's reputation and (ii) knowledge workers' impact on society and the natural environment—can contribute to employees' identification with the firm (thereby decreasing the propensity to "talk"). Similarly, stronger identification with the firm can enhance knowledge workers' propensity to stay at their current employer (thereby decreasing the propensity to "walk").

citizenship towards the firm's wider set of stakeholders likely improves knowledge workers' general justice perception and strengthens their ethical behavior towards the organization, decreasing their willingness to undermine the previous employer by leaking its valuable knowledge to the new employer.

In sum—and in contrast to direct employee benefits (such as pecuniary benefits) and other management practices that aim at preventing knowledge leakage—we expect that firms' CSR initiatives strengthen knowledge workers' loyalty in terms of both the “walking” and “talking.” First, CSR initiatives allow knowledge workers to derive intangible benefits from having (direct and indirect) impact on society and the natural environment, which in turn decreases their propensity to walk out the door. Second, even if they choose to do so—which is common among knowledge workers—their former employer's good corporate citizenship towards society strengthens knowledge workers' identification with the firm and their ethical decision-making. Accordingly, we expect that, when firms engage in CSR, knowledge workers are less likely to disclose the firm's valuable knowledge even if they join a rival firm.⁹

2.4 | Survey evidence

To substantiate the above arguments, we conduct a large-scale survey of knowledge workers. See the Online Appendix S1 (Appendix A. Survey of knowledge workers) for details on the survey design and precise wording of the questions.

For all survey questions, we asked respondents to agree or disagree with the proposed statements, using a standard 6-point Likert scale ranging from *Strongly Disagree* (= 1) to *Strongly Agree* (= 6). Table 1 summarizes the responses to our questions.¹⁰ Panel (A) provides the responses to the preliminary questions. First, nearly all survey respondents (83%) stated that they are currently working or have previously worked as employees with access to a firm's trade secrets.¹¹ Moreover, 98% of respondents agreed that it is important for a firm to put in place practices that aim to retain workers with access to a firm's trade secrets, with a mean response of 5.3 out of 6. The mean is statistically different from the neutral mid-point response of 3.5 at all conventional significance levels ($p = 0.000$).

Panel (B) then reports the answers to the questions about whether respondents view CSR as a means of reducing knowledge spillovers. First, 95% agreed that socially-responsible practices can enhance knowledge workers' appreciation of their current employment (with a mean response of 5.0 out of 6), and 93% agreed that socially responsible practices can improve the firm's ability to retain knowledge workers (with a mean response of 4.9 out of 6). Moreover, respondents generally agreed that CSR practices help differentiate the company from other firms (91% with a mean response of 4.6); improve the overall reputation of the company (97% with a mean response of 5.0); allow employees to have a positive impact on society and the natural environment (92% with a mean response of 4.9); and help strengthen workers' loyalty to the company (89% with a mean response of 4.7). Importantly, the majority of participants (64% with a mean response of 3.9) agreed that CSR practices decrease the risk that knowledge workers disclose a firm's unique and valuable knowledge even if they choose to leave the company and work for the rival firm. For all these responses the mean was statistically different from the neutral mid-point response of 3.5 at all conventional significance levels ($p = 0.000$).

⁹Moreover, knowledge workers' reluctance to talk will likely discourage competing firms from poaching and hiring them in the first place. As such, the fact that the workers are less likely to talk might decrease their propensity to walk. This, in turn, likely further enhances the effectiveness of CSR as a defense mechanism against knowledge leakage.

¹⁰Respondent characteristics are provided in Table A1 (Appendix S1).

¹¹For this reason, we refer to this survey as a survey of “knowledge workers.” The results are similar if we exclude the 17% respondents who reported not having access to trade secrets.

TABLE 1 Alumni survey

		Mean	Median	SD	% Agree	<i>p</i> -Value (mean vs. mid-point)	<i>p</i> -Value (% agree vs. 50%)
Panel (A): Preliminary questions							
Had access to trade secrets (yes/no)	—	—	—	—	82.7%	—	0.000
Important to retain workers with access to trade secrets	5.3 (out of 6)	5	0.78	97.9%	0.000	0.000	
Panel (B): General questions: In general, CSR ...							
... enhances knowledge workers' appreciation of their current employment	5.0 (out of 6)	5	0.91	95.0%	0.000	0.000	
... improves the firm's ability to retain knowledge workers	4.9 (out of 6)	5	0.98	92.6%	0.000	0.000	
... helps differentiate the company from other employers	4.6 (out of 6)	5	0.98	90.5%	0.000	0.000	
... improves the overall reputation of the company as a workplace	5.0 (out of 6)	5	0.83	96.8%	0.000	0.000	
... allows employees to have a positive impact on society and the natural environment	4.9 (out of 6)	5	0.99	92.4%	0.000	0.000	
... helps strengthen workers' loyalty to the company	4.7 (out of 6)	5	1.08	88.8%	0.000	0.000	
... decreases the risk that knowledge workers disclose a firm's unique and valuable knowledge such as trade secrets even if they choose to leave the company to work for a rival firm	3.9 (out of 6)	4	1.28	63.8%	0.000	0.000	
Panel (C): Hypothetical scenarios: To mitigate the threat of knowledge spillovers, I would ...							
... increase nonsalary work/life benefits (e.g., flex time, child care, etc.)	4.7 (out of 6)	5	1.04	90.7%	0.000	0.000	
... offer more authority and employee involvement	4.9 (out of 6)	5	0.95	93.4%	0.000	0.000	
... improve the firm's policies to support minorities and other underrepresented groups	4.1 (out of 6)	4	1.20	74.7%	0.000	0.000	
... improve the work environment	4.6 (out of 6)	5	1.00	88.3%	0.000	0.000	
... provide the opportunity to devote some of the work time to environmental/social initiatives	4.1 (out of 6)	4	1.15	74.4%	0.000	0.000	
... increase the firm's engagement in local communities	4.0 (out of 6)	4	1.14	70.0%	0.000	0.000	
... increase the firm's efforts to be eco-friendly	3.9 (out of 6)	4	1.14	68.8%	0.000	0.000	
... improve firm relations with customers	4.6 (out of 6)	5	1.10	86.3%	0.000	0.000	

Notes. Agreement is measured on a 6-point Likert scale ranging from *Strongly Disagree* (= 1) to *Strongly Agree* (= 6). “*p*-value (mean vs. mid-point)” indicates whether the mean is significantly higher than the neutral mid-point of 3.5; “*p*-value (% agree vs. 50%)” indicates whether the percentage of respondents agreeing with the statement is significantly higher than 50%. The precise wording of the questions is provided in Appendix A of Online Appendix S1.

Finally, Panel (C) reports the answers to questions pertaining to a hypothetical scenario, in which respondents were told that a legislative change was about to increase the threat of knowledge spillovers. The respondents agreed that, in order to counter the threat of knowledge spillovers, they would (a) increase nonsalary work/life benefits (91% with a mean response of 4.7); (b) offer more authority

and employee involvement (93% with a mean response of 4.9); (c) improve the firm's policies to support minorities (75% with a mean response of 4.1); (d) improve the work environment in terms of health safety, recreational facilities, sports, and wellness offerings (88% with a mean response of 4.6); (e) provide employees with the opportunity to devote some of their work time to environmental/social initiatives (74% with a mean response of 4.1); (f) increase the firm's engagement in local communities (70% with a mean response of 4.0); (g) increase the firm's efforts to be eco-friendly (69% with a mean response of 3.9); and (h) improve the firm's relations with customers (86%; with a mean response of 4.6). Again, we note that for all these responses, the mean was statistically different from the neutral mid-point response of 3.5 at all conventional significance levels ($p = 0.000$).

Overall, the survey evidence is consistent with the arguments proposed above: CSR practices are perceived to mitigate the threat of knowledge leakage in two ways—knowledge workers are less inclined to join rival firms and, even if they do, they are less likely to disclose the firm's valuable knowledge to their new employer.¹² The evidence further indicates that a broad set of CSR policies (not just employee-related CSR programs) are perceived to be effective.

2.5 | Corporate social responsibility as strategic response to the threat of knowledge leakage

The above arguments—along with the survey evidence—suggest that CSR practices mitigate the risk of knowledge leakage in two ways: (i) knowledge workers are less likely to join a rival firm (i.e., they are less likely to “walk”), and (ii) even if they do, they are less likely to disclose the firm's valuable knowledge to their new employer (i.e., they are less likely to “talk”). Hence, when the risk of knowledge spillovers increases, we expect companies to strategically increase their engagement in CSR practices.

A key assumption underlying this prediction is that managers recognize the value of CSR in mitigating knowledge leakage. As discussed above, this assumption is supported by the survey results—respondents recognize the two-fold effect that CSR practices have on knowledge workers' behavior, and see the firm's CSR engagement (with respect to a wide set of stakeholders) as a way to address the risk of knowledge leakage.

It is this two-fold effect on knowledge workers' loyalty that sets CSR apart from other management practices, which also aim to prevent knowledge leakage to rival firms. Numerous practices—such as increasing the legal protection of intellectual property through patenting (Kim & Marschke, 2005), establishing a reputation for toughness in patent enforcement (Agarwal et al., 2009), signing noncompete agreements (Marx, 2011; Marx et al., 2009), and enhancing pecuniary incentives (Carnahan et al., 2012; Kacperczyk & Balachandran, 2018)—allow firms to reduce knowledge spillovers through decreased mobility of knowledge workers. Yet, as discussed above, many knowledge workers still leave for rival firms, and interfirm mobility tends to be higher among those whose know-how is also valuable to competing companies (e.g., Ganco et al., 2015; Marx et al., 2009). Therefore, shielding against knowledge spillovers also requires that firms reduce employees' propensity to disclose valuable knowledge in case they do join a competitor. Unlike other tools, CSR practices mitigate such disclosure risk by enhancing knowledge workers' identification with the firm and their ethical behavior towards the organization, thereby decreasing the risk that they would disclose the firm's valuable knowledge upon joining a competitor. Moreover, CSR programs are firm-specific and arguably less easily imitable by other companies than pecuniary incentives, thus allowing the

¹²All results are similar if we restrict the sample to respondents who indicated that they currently work in a managing role (CEO, executive, or manager—about 59% of the respondents) and hence have the actual ability to implement CSR policies.

focal firm to align knowledge workers' interests with organizational goals without directly allocating rents to their workers. Accordingly, based on the above arguments, we expect firms to increase their CSR in response to an increased threat of knowledge leakage.¹³

Hypothesis (H1). *Companies respond to an increase in the threat of knowledge leakage by increasing their corporate social engagement.*

3 | DATA AND METHODOLOGY

3.1 | Data and variable definitions

3.1.1 | 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, that is, 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 disclose valuable firm knowledge. To rule out such 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. As such, the inevitable disclosure doctrine provides employers with a strong mechanism to reduce knowledge spillovers by decreasing interfirm mobility of knowledge workers (e.g., Castellaneta, Conti, & Kacperczyk, 2016; Gilson, 1999; Png & 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). Appendix B of Online Appendix S1 describes the institutional background underlying the doctrine.

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 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 2013 (the end of our sample), a total of 14 states in the U.S. had rejected the inevitable disclosure doctrine. Table A2 (of Online Appendix S1) lists all 14 states along with the rejection years (and

¹³Naturally, this assumes that the firm's response is not fully impaired by organizational rigidities. In this vein, while we conjecture that companies respond to the increased risk of knowledge leakage by increasing their engagement in CSR practices, we note that imperfect information flow and coordination within the organization may cause some delay in responding. This could explain why the increase in CSR comes with a 12–24 months lag in the dynamic analysis (for details, see Table 2 and Figure A1 in Online Appendix S1, which we discuss in the Results section).

the relevant cases). This list is adapted from Kahnke, Bundy, and Liebman (2008) and Kahnke and Bundy (2013), and is updated with recent court rulings.¹⁴

3.1.2 | 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 onward; 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 United States. Using these selection criteria, we obtain a final sample of 30,216 firm-year observations from 1991 to 2013.

3.1.3 | 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 towards 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 (see Chatterji, Durand, Levine, & Touboul, 2016).

We construct the composite KLD-index by summing up the number of KLD strengths with respect to employees, customers, the natural environment, and communities.¹⁵ In the analysis, we also consider subindices based on specific stakeholder groups.

One caveat of the KLD-index—and, more generally, any CSR rating—is that it is subject to measurement error, as it is difficult to accurately measure CSR (e.g., Chatterji et al., 2016; Chatterji, Levine, & Toffel, 2009; Delmas & Blass, 2010). This measurement error is unlikely to bias our results, though—intuitively, there is no reason to expect a systematic relationship between measurement error in the KLD-index and state courts' rejection of the inevitable disclosure doctrine. In addition, in auxiliary analysis, we show that our results are robust if we use Thomson Reuters' ASSET4 index of social and environmental performance in lieu of the KLD-index, thereby following Chatterji et al.'s (2016) advice to use more than one measure of CSR to minimize potential issues of measurement error.

3.1.4 | 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. *Size* is the natural logarithm of the book value of total assets. *Return on assets* (ROA) is the ratio of operating income before depreciation to the book value of total assets. *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. *Leverage* is the ratio of

¹⁴We 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. Note that a 15th state, Louisiana, rejected the inevitable disclosure doctrine in 1967. This rejection year precedes our sample period and hence is not pertinent to our analysis.

¹⁵In addition to CSR strengths, the KLD database also contains a list of CSR weaknesses, labeled "concerns." Accordingly, an alternative approach is to construct a "net" KLD-index by subtracting the number of concerns from the number of strengths. In robustness checks, we show that our results are similar if we use this net KLD-index instead.

debt (long-term debt plus debt in current liabilities) to the book value of total assets. *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 1st and 99th percentiles of their empirical distribution.

3.1.5 | Summary statistics

In Table A3 (Online Appendix S1), we present descriptive statistics for the main 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.

3.2 | Methodology

3.2.1 | 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 14 treatments listed in Table A2 (Online Appendix S1). 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:

$$KLD_{it} = \alpha_i + \alpha_j \times \alpha_t + \alpha_r \times \alpha_t + \beta \times IDD_{st} + \gamma' \mathbf{X}_{it} + \varepsilon_{it}, \quad (1)$$

where i indexes firms; t indexes years; j indexes 2-digit SIC industries; s indexes states of location; r indexes Census regions; α_i are firm fixed effects; $\alpha_j \times \alpha_t$ are industry by year fixed effects; and $\alpha_r \times \alpha_t$ are region by year fixed effects, respectively.¹⁶ KLD is the dependent variable of interest. IDD is the “treatment dummy”—that is, a dummy variable that equals one if the company is located in a state that has rejected the inevitable disclosure doctrine by year t .^{17,18} \mathbf{X} is the vector of control variables, which includes size, ROA, Tobin's Q, leverage, and cash holdings. ε is the error term. The regression is estimated by Ordinary Least Squares (OLS). We account for serial correlation of the error term by clustering SEs at the state of location. The coefficient of interest is β , which measures the effect of the rejection of the inevitable disclosure doctrine on firms' CSR. Hypothesis 1 predicts that β should be positive and significant.

In regression (1), α_i accounts for unobserved heterogeneity at the firm level. (Note that state fixed effects are subsumed by the firm fixed effects and hence need not be included.) The inclusion of $\alpha_j \times \alpha_t$ accounts for industry trends that may correlate with the treatment. Similarly, the inclusion of $\alpha_r \times \alpha_t$ account for any regional trend (e.g., regional economic booms) that may correlate with the rejection of the inevitable disclosure doctrine.¹⁹ Finally, the controls account for differences in terms of

¹⁶For the mapping of states to Census regions, see U.S. Census Bureau (1994, pp. 6–24).

¹⁷The inevitable disclosure doctrine applies at the state of location (as opposed to the state of incorporation). To proxy for the state of location, we use the state of headquarters' location provided in Compustat. Doing so raises two measurement issues. First, Compustat only records the state of location for the latest available year and hence does not account for headquarters relocations. Second, the state of headquarters' location is an imperfect measure of employees' location—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. In robustness checks, we address these measurement issues by using the data of Garcia and Norli (2012) on the state-level operations of companies based on their 10-K filings. Following the approach of Flammer and Luo (2017), we then show that our results are robust if we restrict the sample to the subset of firms that have at least 80% of their operations in the state in question (“geographically concentrated firms”).

¹⁸Note that the control group includes all states that have not rejected the IDD—that is, it includes states that have not ruled on the IDD, as well as states that have ruled in favor. In robustness checks, we consider several variations of the control group.

¹⁹Note that we cannot include state by year fixed effects since the treatment is at the state-year level.

size, profitability (ROA), investment opportunities (Tobin's Q) and financing (leverage and cash holdings).

Our identification strategy can be illustrated 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 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.

Our identification strategy needs to satisfy two requirements to be valid. First, the treatment (i.e., the rejection of the IDD) needs to bring about *relevant* changes in the threat of knowledge spillovers (relevance condition). Second, the treatment needs to be *exogenous* with respect to CSR (exclusion restriction). In Appendix C of Online Appendix S1, we discuss both requirements in detail.

4 | RESULTS

Main results. The main results are presented in columns (1)–(3) of Table 2. 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 also include industry \times year and region \times year fixed effects. In column (3), we further include control variables. As can be seen, the coefficient of the treatment dummy is positive and significant in all three specifications. More specifically, it lies between 0.167 and 0.258 and is always significant at the 5% level (*p*-values ranging between 0.012 and 0.041). This implies that the rejection of the inevitable disclosure doctrine leads to a CSR increase by about 0.17–0.26 KLD strengths. This effect is quite sizeable. Since the average number of KLD strengths is 1.357 (and the *SD* 2.208, see Table A3 in Online Appendix S1), it implies that companies increase their CSR by 13–19% following the rejection of the inevitable disclosure doctrine (corresponding to an increase by 8–12% of a *SD*). Overall, these findings indicate that firms respond to the increased threat of knowledge spillovers by increasing their social engagement, which lends support to Hypothesis 1.

Dynamics. In column (4), 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 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

TABLE 2 Main results

Dependent variable	KLD-index				KLD-index	KLD-index	KLD-index
	(1)	(2)	(3)	(4)	(employees)	(environment and community)	(customers)
IDD	0.258 (0.126)	0.167 (0.070)	0.171 (0.068)		0.085 (0.046)	0.075 (0.035)	0.011 (0.011)
IDD (-1)				-0.008 (0.060)			
IDD (0)				0.022 (0.072)			
IDD (1)				0.175 (0.092)			
IDD (2+)				0.285 (0.098)			
Size		0.174 (0.076)	0.177 (0.075)		0.136 (0.048)	0.013 (0.031)	0.025 (0.007)
ROA		0.079 (0.140)	0.081 (0.142)		0.138 (0.101)	-0.057 (0.067)	-0.003 (0.025)
Tobin's Q		-0.028 (0.017)	-0.027 (0.017)		-0.008 (0.015)	-0.023 (0.007)	0.004 (0.003)
Leverage		0.187 (0.114)	0.188 (0.114)		0.066 (0.068)	0.095 (0.057)	0.026 (0.027)
Cash		0.444 (0.145)	0.450 (0.145)		0.173 (0.103)	0.233 (0.063)	0.039 (0.021)
Year fixed effects	Yes	-	-	-	-	-	-
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry \times year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Region \times year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> ²	0.750	0.777	0.778	0.778	0.746	0.683	0.558
Observations	30,216	30,216	30,216	30,216	30,216	30,216	30,216

Notes. SEs (clustered at the state level) are reported in parentheses.

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.²⁰

Stakeholder groups. In columns (5)–(7), we decompose the KLD-index into three subindices pertaining to (i) employees, (ii) environment and communities, and (iii) customers (i.e., product responsibility). We find that all three subindices increase following the treatment, suggesting that companies use a broad range of CSR practices to mitigate the threat of knowledge spillovers. More specifically, the effect is large and significant for employees (coefficient of 0.085, *p*-value = 0.065)

²⁰In Figure A1 (Online Appendix S1), 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 3 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 A1 (Online Appendix S1) mirrors the pattern in column (4) of Table 2—there is no pre-trend, the effect comes with a lag of 12 to 24 months, and it is somewhat persistent over time.

as well as the environment and communities (coefficient of 0.075, *p*-value = 0.032), while it is somewhat smaller for customers (coefficient of 0.011, *p*-value = 0.317).

ASSET4. In Table A4 (Online Appendix S1), we re-estimate our baseline specification using Thomson Reuters' ASSET4 ratings (in lieu of the KLD-index).²¹ ASSET4 rates companies along three dimensions ("pillars"): environmental issues, social issues, and corporate governance. In the analysis, we use the first two ratings (*environment score*, *social score*), along with the composite score that combines both ratings (*composite score*). As is shown, both the environment and social scores (as well as the composite score) increase significantly following the rejection of the inevitable disclosure doctrine, consistent with our findings based on KLD data.²² In Table A5 (Online Appendix S1), we further refine this analysis by splitting *environment score* and *social score* into the underlying ten ASSET4 categories. Again, the results mirror those we obtained with the KLD data—the increase is large for the ASSET4 categories pertaining to employees (columns (1)–(4)), communities and society (columns (5)–(6)) and the environment (columns (8)–(10)), while it is somewhat smaller for customers (column (7)).²³ Overall, this finer analysis confirms that companies use several CSR levers in response to the threat of knowledge spillovers (not just employee-related CSR).

Alternative explanations. The results in Table 2 show that companies respond to the treatment by increasing their CSR, consistent with our arguments that CSR helps mitigate knowledge spillovers. There are other potential explanations, though. First, it could be that—due to the higher mobility of knowledge workers induced by the rejection of the IDD—companies find it less attractive to allocate resources to R&D and employee training. Instead, they would reallocate these resources to other projects such as CSR, which could explain our results. Nevertheless, we find no evidence in support of this alternative. As discussed above, in Table A5 (Online Appendix S1), we find that the ASSET4 component "workforce: training and development" increases (as opposed to decreases) following the treatment. Moreover, in Table A6 (Online Appendix S1), we re-estimate our baseline specification using R&D as dependent variable, defined as the ratio of R&D expenditures to sales (column (1)) and the ratio of R&D expenditures to total assets (column (2)), both winsorized at the 1st and 99th percentiles of their empirical distribution. We find no significant change in R&D spending following the treatment.²⁴ Second, it could be that companies increase CSR in order to attract new knowledge workers, in addition to retaining existing workers and preventing knowledge spillovers. Both are closely related—arguably, if CSR is effective at retaining workers and preventing knowledge spillovers, it may also be effective in attracting knowledge workers. In the next section, we conduct two experiments that provide direct evidence of the effectiveness of CSR to prevent knowledge spillovers. Hence, our results are unlikely to merely capture the "attracting new workers" role of CSR.

²¹Note that the sample drops to 5,112 firm-year observations due to the less comprehensive coverage of ASSET4, which starts in 2002 and covers fewer U.S. firms than the KLD data.

²²ASSET4 ratings range from 0 to 100. The average social score is 50.8. Hence, the point estimate of 4.0 (*p*-value = 0.043) corresponds to an increase in the social score by 8.7%. Similarly, the average environment score is 46.1. Accordingly, the point estimate of 3.1 (*p*-value = 0.055) corresponds to an increase in the environment score by 6.7%.

²³The coefficient of IDD is significant for all four employee categories (*workforce: diversity and opportunities*; *workforce: employment quality*; *workforce: health and safety*; *workforce: training and development*) with *p*-values ranging from 0.006 to 0.087; it is significant for *society: community* (*p*-value = 0.096) and marginally insignificant for *society: human rights* (*p*-value = 0.115); it is insignificant for *customer: product responsibility* (*p*-value = 0.300); it is significant for *environment: emission reduction* and *environment: resource reduction* (with *p*-values of 0.059 and 0.052, respectively), and insignificant for *environment: product innovation* (*p*-value = 0.211).

²⁴This need not imply that the rejection of the IDD does not affect innovation. In fact, Contigiani, Hsu, and Barankay (2018) show that the (citation-weighted) patent count decreases following the rejection of the IDD. Taken together, these results suggest that, while companies maintain their R&D budgets, they are less effective in converting their R&D into successful patents.

Robustness and extensions. Supplemental analyses are provided in the Online Appendix S1. In Appendix D (and Table A7), we present a series of robustness checks.²⁵ In Appendix E (and Tables A8 and A9), we explore the heterogeneity in the treatment effect.²⁶

5 | EXPERIMENTAL EVIDENCE

The results presented so far show that companies respond to the threat of knowledge spillovers by increasing their CSR engagement. As discussed above, our proposed rationale is that CSR helps mitigate knowledge spillovers by (i) reducing employees' propensity to join a rival firm, and (ii) reducing employees' propensity to disclose the firm's valuable knowledge even if they join a rival firm. In this section, we describe two experiments (a laboratory experiment and an online experiment) that shed light on the latter.

5.1 | Experiment design

We conducted two experimental vignette studies.²⁷ The first one was conducted in the Behavioral Lab of Boston University's Questrom School of Business. A total of 585 students participated in this lab experiment. The second one was conducted using the online labor-sourcing platform Amazon Mechanical Turk. A total of 459 online workers currently employed in the U.S. and holding at least a bachelor degree participated in this online experiment.

The same script was used in both experiments. At the beginning, participants received a message describing their current employer. To obtain variation in the employer's engagement in CSR, we used four different variations of the employer's description, which we randomly assigned to the participants. We used two control groups and two treatment groups. The first control group received a generic company description with no reference to CSR ("baseline"). Both treatment groups received the same company description as in the baseline, but with supplemental information describing the company's CSR engagement. For the first treatment group, the CSR engagement was in terms of employees, while for the second treatment group it was in terms of the environment and communities. Finally, to account for the fact that, compared to the baseline, the treatment groups received more information, we used a second control group in which we supplemented the baseline company description with additional generic company information (such that the length and format of the supplemental generic information was similar to that of the supplemental CSR information used in the treatment groups). This second control group allowed us to rule out the possibility that our results may capture "more information" as opposed to "CSR information." See

²⁵In particular, we show that our results are robust (i) if we include a large set of time-varying state-level controls (capturing changes in the state's pro-social values, changes in local economic conditions, and regulatory changes such as the adoption of the Uniform Trade Secret Act (UTSA)); (ii) if we use alternative control groups; (iii) if we restrict the sample to the eventually treated companies (to mitigate the possibility of unobserved differences between treated and control firms); (iv) if we restrict the sample to geographically concentrated companies; (v) if we use alternative techniques to account for serial correlation; and (vi) if we use the "net" KLD-index that accounts for CSR concerns.

²⁶We find that the treatment effect is stronger when the risk of knowledge spillover is higher. Specifically, we observe a larger treatment effect for companies that (i) operate in states that have weaker enforcement of non-compete agreements (based on Starr's (2018) enforceability index), (ii) are located closer to innovation hubs, as well as companies operating in industries that are (iii) more R&D intensive, (iv) more competitive, and (v) have more attractive investment opportunities.

²⁷A vignette study indicates a hypothetical situation to which research participants respond, thereby revealing their perceptions, values, social norms, or impressions of events. Experimental vignette studies are widely used in the social and behavioral sciences to assess attitudes, behaviors, and related constructs when experimental manipulation is unethical or impractical.

Table A10 (Online Appendix S1) for the phrasing of the four messages, as well as the complete script of the experiment.

In addition to the employer's description, all participants were told that "for this employer you were part of a small team that had developed an extensive client list (Client List A)—of current and prospective clients—that is used for direct marketing purposes globally [...] this client list is very valuable to the company and is a well-kept trade secret." The participants were further informed that their employer undertook considerable efforts to protect the client list (see Table A10 in Online Appendix S1 for details). Subjects were then told that they moved to a competitor in early 2018. Compared to the previous employer, the new employer was described as having a relatively short client list (Client List B). Participants were asked to launch a direct marketing campaign for the new employer by reaching out to current and potential clients. Participants were presented with three choices: they could email (1) Client List A, (2) Client List B, or (3) Client Lists A and B. Participants who selected "Client List B" were choosing not to disclose their previous employer's trade secret, whereas participants who selected either of the other two options were choosing to disclose their previous employer's valuable knowledge to the new employer. Finally, at the end of the experiment, we asked participants to answer an open-ended question ("Please explain your choice") in order to elicit the reason underlying their choice.

5.2 | Results

The results are presented in Table 3 (laboratory experiment) and Table 4 (online experiment). In Panel (A) of both tables, we compare the treated participants (pooling both treatment groups) versus the control participants (pooling both control groups).²⁸ In the lab experiment, we found that 39.5% of the treated subjects clicked on "Client List B," compared to 29.2% of the control subjects. The difference (10.3%) is significant at conventional statistical levels (p -value = 0.009). Similarly, in the online experiment, we found that 65.1% of the treated subjects clicked on "Client List B," compared to 51.1% of the control subjects. The difference (14.0%) is again statistically significant (p -value = 0.002). These findings are consistent with our argument that CSR reduces employees' propensity to disclose the firm's valuable knowledge upon joining a competitor.

One potential concern is that subjects may not devote the necessary attention—for example, participants may quickly browse through the text and pick an arbitrary answer—which would attenuate our results. To mitigate this issue, in Panel (B) of Tables 3 and 4, we restrict the samples to subjects who were more likely to pay attention. For the laboratory experiment, we focused on subjects whose time spent on the survey was above the median across all respondents ("attention criterion"). For the online experiment, we focused on subjects who passed an attention check—specifically, subjects who correctly remembered the firm's CSR engagement (or lack thereof), when asked at the end of the survey. We find that our results are indeed stronger in these subsamples.

In Panels (C) and (D) we repeat the analysis of Panels (A) and (B), respectively, decomposing the treatment and control groups into the four subgroups described above. A caveat of this analysis is that we have fewer observations per subgroup, which reduces the power of our tests. Nevertheless, we find that our results are generally robust regardless of which subgroups we consider—the percentage of participants choosing "Client List B" is always higher for treated participants

²⁸The randomization ensures that there is no systematic difference between treatment and control groups. To assess the randomization, we confirmed that participants' characteristics were balanced across groups.

TABLE 3 Laboratory experiment**Panel (A): Baseline sample**

	Control (N = 291)	Treated (N = 294)	Difference (N = 585)	p-Value (difference)
Client List B (no disclosure of proprietary info)	29.2%	39.5%	10.3%	0.009

Panel (B): Sample fulfilling attention criterion

	Control (N = 137)	Treated (N = 143)	Difference (N = 280)	p-Value (difference)
Client List B (no disclosure of proprietary info)	31.4%	53.1%	21.7%	0.000

Panel (C): Variations in phrasing (baseline sample)

	Control Baseline (N = 144) (1)	Control Length-matched (N = 147) (2)	Treated Employee CSR (N = 149) (3)	Treated Society CSR (N = 145) (4)
Client List B (no disclosure of proprietary info)	29.9%	28.6%	45.0%	33.8%
Difference (p-value in parentheses)				
(3) vs. (1)	15.1%	(0.008)		
(3) vs. (2)	16.4%	(0.004)		
(4) vs. (1)	3.9%	(0.473)		
(4) vs. (2)	5.2%	(0.336)		

Panel (D): Variations in phrasing (sample fulfilling attention criterion)

	Control Baseline (N = 70) (1)	Control Length-matched (N = 67) (2)	Treated Employee CSR (N = 73) (3)	Treated Society CSR (N = 70) (4)
Client List B (no disclosure of proprietary info)	32.9%	29.9%	58.9%	47.1%
Difference (p-value in parentheses)				
(3) vs. (1)	26.0%	(0.002)		
(3) vs. (2)	29.0%	(0.001)		
(4) vs. (1)	14.2%	(0.085)		
(4) vs. (2)	17.2%	(0.038)		

(columns (3)–(4)) compared to control participants (columns (1)–(2)). In particular, in the most conservative specifications—that is, columns (2)–(4) of Panel (D) in Table 3, where we use the length-matched control group and apply the attention criterion—we find that treated participants based on CSR related to employees (and environment and communities, respectively) are 29.0% (and 17.2%, respectively) more likely to choose “Client List B,” with a *p*-value of 0.001 (and 0.038, respectively). The pattern is again similar in Table 4. These findings indicate that various types of CSR (i.e., not just employee-related CSR) help mitigate the disclosure of valuable knowledge. This is consistent with our findings based on the rejection of the inevitable disclosure doctrine. Overall, the results of these experiments provide supportive evidence that CSR reduces employees’ propensity to disclose the firm’s valuable knowledge even if they join a competitor.

Finally, to shed light on the motives underlying the respondents’ choice, we evaluate the data collected through the open-ended question administered at the end of the experiment. The following

TABLE 4 Online experiment**Panel (A): Baseline sample**

	Control (N = 227)	Treated (N = 232)	Difference (N = 459)	p-Value (difference)
Client List B (no disclosure of proprietary info)	51.1%	65.1%	14.0%	0.002

Panel (B): Sample fulfilling attention criterion

	Control (N = 199)	Treated (N = 205)	Difference (N = 404)	p-Value (difference)
Client List B (no disclosure of proprietary info)	48.7%	63.9%	15.2%	0.002

Panel (C): Variations in phrasing (baseline sample)

	Control Baseline (N = 109) (1)	Control Length-matched (N = 118) (2)	Treated Employee CSR (N = 114) (3)	Treated Society CSR (N = 118) (4)
Client List B (no disclosure of proprietary info)	48.6%	53.4%	64.0%	66.1%
Difference (p-value in parentheses)				
(3) vs. (1)	15.4%	(0.020)		
(3) vs. (2)	10.6%	(0.100)		
(4) vs. (1)	17.5%	(0.008)		
(4) vs. (2)	12.7%	(0.047)		

Panel (D): Variations in phrasing (sample fulfilling attention criterion)

	Control Baseline (N = 95) (1)	Control Length-matched (N = 104) (2)	Treated Employee CSR (N = 109) (3)	Treated Society CSR (N = 96) (4)
Client List B (no disclosure of proprietary info)	47.4%	50.0%	63.3%	64.6%
Difference (p-value in parentheses)				
(3) vs. (1)	15.9%	(0.022)		
(3) vs. (2)	13.3%	(0.050)		
(4) vs. (1)	17.2%	(0.017)		
(4) vs. (2)	14.6%	(0.037)		

pattern emerges. First, 29.8% of the respondents justified their decision not to share trade secrets by mentioning issues of loyalty, trust, and ethics (e.g., “To stay loyal and respect my previous employer,” “I won’t betray trust from my previous employer,” “It’s unethical to use my previous employer’s list”). Importantly, arguments pertaining to loyalty, trust, and integrity were mentioned by 34.5% of respondents in the treatment group versus 25.1% of respondents in the control group (the difference is significant with a *p*-value of 0.028). Second, 10.0% of the respondents mentioned potential legal repercussions of sharing trade secrets (“I would feel like there would be severe consequences for me if I gave trade secrets that were confidential to a fellow company”), with no significant difference between treated and control subjects (10.3% of the treated respondents versus 9.6% of the control respondents; *p*-value of 0.816). Third, opportunistic motives were mentioned by 25.1% of the respondents (e.g., “I will contact both because it will make me look better if I get more results”). This argument was made more commonly by respondents in the control group (30.8%) compared to respondents in the treatment group (19.4%; the difference is significant with *p*-value

= 0.005). Finally, the remaining respondents (35.1%) provided miscellaneous information that could not be coded in an informative way.^{29,30}

Overall, the answers to the open-ended question indicate that loyalty, trust, and ethics (along with a reluctance to engage in opportunistic behavior) played a key role in the treated respondents' unwillingness to share trade secrets with the future employer. These findings are consistent with our argument that CSR reduces employees' propensity to disclose the firm's valuable knowledge upon joining a competitor.³¹

6 | DISCUSSION AND CONCLUSION

How do firms respond to the threat of knowledge spillovers? Answering this question is at the 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, a firm's strategic engagement in relationship-based practices as a defense against knowledge spillovers has remained largely unexplored. Our study aims to make ground on this question.

We propose that, when exposed to an increased threat of knowledge spillovers, firms strategically increase their CSR as a defense. The rationale is two-fold: employees of firms with higher CSR are less inclined to join rival firms (i.e., they are less likely to "walk" out the door) and, even if they do, they are less likely to disclose the firm's valuable knowledge to their new employer (i.e., they are less likely to "talk").

Our empirical strategy involves several steps, as we triangulate survey, observational, and experimental data. First, we conduct a large-scale survey of knowledge workers to substantiate our arguments that CSR practices are perceived to mitigate the threat of knowledge spillovers by reducing knowledge workers' propensity to (i) join rival firms, and (ii) disclose the firm's valuable knowledge even if they join a rival firm.

We then leverage observational data to examine whether companies respond to the threat of knowledge spillovers by increasing their CSR. Specifically, we exploit a quasi-natural experiment provided by the rejection of the inevitable disclosure doctrine by several U.S. states. Since the doctrine prevents employees with valuable know-how from working for a competitor in the immediate future, its rejection 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 threat of knowledge spillovers. Consistent with our prediction, we find that companies react to the rejection of the inevitable disclosure doctrine by significantly increasing their engagement in CSR. This suggests that CSR is used as a defense to counter the risk of knowledge spillovers.

Finally, we supplement our findings by conducting two experimental vignette studies: a laboratory experiment and an online experiment. In these experiments, we randomly assigned subjects to

²⁹Two coders assessed the responses obtained through open-ended questions. The inter-rater reliability was high (Cohen's kappa = 0.83).

³⁰The above statistics refer to the online experiment. A similar pattern emerges from the lab experiment, but with a higher fraction of miscellaneous responses.

³¹We caution that our experiments are subject to important limitations. First—and this is a common caveat of experiments—business school students and online workers need not be representative of the universe of knowledge workers, which may limit the external validity of the findings. Second, our evidence is based on a vignette study and therefore, relies on hypothetical employers (as opposed to the participants' actual employers).

hypothetical employers that either engaged or did not engage in CSR. Subjects then joined a rival firm and faced the decision of whether to disclose their previous employer's proprietary knowledge. We find that employees whose previous employer engaged in CSR were less likely to disclose their previous employer's valuable knowledge. This provides direct evidence that CSR reduces employees' propensity to disclose the firm's valuable knowledge even if they choose to join a rival firm.

To the best of our knowledge, our study is the first to examine whether companies respond to the increased threat of knowledge spillovers by increasing their CSR. As such, 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 know-how. In particular, a vibrant literature studies the impact of legal mechanisms—such as noncompete covenants, patent enforcement, and the inevitable disclosure doctrine—on employee mobility, knowledge spillovers, and imitation by rival firms (e.g., Agarwal et al., 2009; Ganco et al., 2015; Kim & Marschke, 2005; Marx, 2011; Marx et al., 2009; Png & Samila, 2015). Absent such legal tools, however, companies need to find alternative ways to alleviate the threat of knowledge spillovers. Our study expands the existing literature and indicates that firms use CSR as a strategic management tool to mitigate the risk of knowledge spillovers.

Second, by identifying a management practice—specifically, firms' social responsible practices—that does not rely on pecuniary incentives to manage knowledge workers, we contribute to the literature on employee governance (e.g., Gubler, Larkin, & Pierce, 2016; Larkin & Pierce, 2015; Wang, He, & Mahoney, 2009). In contrast to relationship-based practices, pecuniary incentives have been widely studied in the literature, with many scholars (e.g., Akerlof & Kranton, 2005; Gibbons, 1998; Larkin & Pierce, 2015; Prendergast, 1999) pointing at the drawbacks of pecuniary incentives and the need to go beyond them.

Third, our paper is related to the few but notable studies that examine how specific CSR practices affect employee behavior. In particular, Burbano (2016) shows that online workers are willing to settle for lower wages if their employer has a long tradition of charitable giving. Similarly, Bode et al. (2015) and Bode and Singh (2018) show that management consultants at a global consulting company are less likely to leave the company, and more willing to accept a pay cut, respectively, if they are given the opportunity to engage in pro bono work. Relatedly, Flammer (2015a) and Flammer and Luo (2017) show that CSR has a positive influence on employees' productivity. Our paper contributes to this literature by examining the relationship between firms' CSR practices and their efforts to prevent knowledge appropriation by rivals—it shows that firms react to an increased risk of knowledge spillovers by strategically increasing their CSR as a defense. Our results further suggest that CSR helps mitigate knowledge spillovers in two ways: (i) by reducing knowledge workers' propensity to join a rival firm, and (ii) by reducing knowledge workers' propensity to disclose the firm's valuable knowledge *even if they choose to join a rival firm*.

Fourth, and more broadly, we contribute to the literature on the internal and external drivers of CSR activities, such as regulatory institutions (e.g., Fabrizio, 2012; Flammer, 2015b; Kacperczyk, 2009), the community (e.g., Tilcsik & Marquis, 2013), activists (e.g., Baron & Diermeier, 2007; McDonnell & King, 2013), and shareholders (e.g., Flammer, 2015a). Our study contributes to this line of work by highlighting a novel antecedent of CSR: the risk of losing proprietary knowledge.

Finally, our findings have important managerial implications as failing to retain employees with valuable knowledge can lead to interfirm knowledge spillovers (Agarwal et al., 2009; Almeida & Kogut, 1999; Rosenkopf & 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, Coff, & Kryscynski, 2012). As such, our findings indicate that managers of companies exposed to

the threat of knowledge spillovers may find it worthwhile to devote enough resources to the design of CSR policies.

ACKNOWLEDGEMENTS

We thank 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. We also thank Andrea Fosfuri (the editor), two anonymous reviewers, Alfonso Gambardella, Olga Hawn, Jiao Luo, Daniel Matisoff, Mary-Hunter McDonnell, George Serafeim, Jasjit Singh, Deepak Somaya, Ithai Stern, as well as seminar participants at Bocconi University, Boston University, Columbia GSB, Washington University in St. Louis (Olin), Wharton, the 2016 Academy of Management Annual Meeting, 2016 Alliance for Research on Corporate Sustainability Conference, 2016 LBS Organizations with Purpose Conference, 2016 Strategic Management Society Annual Conference, and the 2015 Wharton People and Organizations Conference for helpful comments. We are grateful to Øyvind Norli for sharing his data on the location of publicly traded companies. Both authors contributed equally.

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How to cite this article: Flammer C, Kacperczyk A. Corporate social responsibility as a defense against knowledge spillovers: Evidence from the inevitable disclosure doctrine. *Strat Mgmt J*. 2019;40:1243–1267. <https://doi.org/10.1002/smj.3025>