Less is more: Peer learning from non-disclosures

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Abstract

The US Securities and Exchange Commission requires US public firms to disclose their material agreements while allowing them to redact/censor parts of these contracts due to proprietary cost concerns. While firms censor contracts to hinder competitor learning, they also reveal to rivals that something valuable is hidden in these contracts. This may result in a stronger motive for rivals to unravel the information concealed in these contracts. In this paper, I investigate whether competitors can extract valuable information from peers' redacted disclosures that might be useful for their future investment decisions. Using the EDGAR log files, I find that redacted material agreements receive up to 53% more downloads than their unredacted counterparts, indicating greater attention and information demand for censored documents. Consistent with peer learning from redacted disclosures, I also find that firms increase their R&D spending and become more similar to redacting peers. Using two plausibly exogenous shocks, I show that the learning effect attenuates when rival attention is disrupted, suggesting that increased *attention* to redacted disclosures might be a potential mechanism that explains peer learning. My study contributes to the literature on corporate investment under uncertainty and provides insight into the underlying mechanisms of peer learning documented in the literature.

Keywords: redacted disclosures, proprietary cost, peer learning, corporate investment

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1. Introduction

Can firms learn from the relative silence or the censorship behavior of their peers? The US Securities and Exchange Commission requires US public firms to disclose their material agreements (e.g. licensing contracts, research collaboration agreements etc.) while allowing them to redact/omit proprietary information from these contracts due to competitive harm if disclosed. In this study, I investigate whether firms can extract valuable information from rivals' redacted disclosures useful for their subsequent investment or market entry decisions.

Investments are fundamental for creating shareholder value, however, even absent information asymmetry, managers are less responsive to investment opportunities due to uncertainty (Dixit, 1990; Bloom et al., 2007). A considerable amount of research examines the sources managers incorporate into their investment decisions to reduce this uncertainty (e.g., Badertscher et al., 2013; Ahçı, Martens, and Sextroh, 2022). Although peer learning from stock prices (e.g., Foucault & Fresard, 2014) or corporate disclosures (Badertscher et al., 2013; Chen et al., 2012; Bustamante & Frésard, 2021) is well-studied, it is yet unclear whether firms can learn from the *non-disclosures* of their peers. Starting from Bushman and Smith (2001), peer disclosures are seen as one source of information for corporate investment decisions. However, which specific peer information firms incorporate into their decision-making process is not extensively studied (Ferracutti & Stubben, 2019). I posit that redacted material agreements (contracts) might be one specific source of information that can provide valuable information to competitors. Redacted contracts may convey an imperfect signal to peers about promising new opportunities or increase the precision of known growth options. Upon observing this signal, managers can update their information set and make better-informed investment decisions since firms face similar supply and demand conditions with their product-market peers.

However, whether and how firms can learn from their rivals' redacted disclosures is ex-ante, not clear. On the one hand, conventional wisdom suggests that firms redact proprietary information to hinder competitor learning. Therefore, the contract in redacted form provides no additional information to peers. But on the other hand, the redaction choice itself is an additional disclosure that signals something valuable is hidden, creating a stronger motive for rivals to unravel the information concealed in the contracts. This is referred to as the *"Streisand effect"* , which is used to describe the unintended consequences of censorship, resulting in higher

motivation to search for the information and a higher chance of revelation than without censorship (e.g., Hagenbach & Koessler, 2017).

Suppose a firm redacts information concerning its novel invention or strategic partnership from its contract. While omitting the proprietary information, the firm also reveals that the contract is censored, which is clearly visible to outsiders and may draw competitors' attention. Since only a part of the contract has been redacted (such as royalty rates, payment terms, etc.), peers can still extract valuable information from the contract, such as the parties of the agreement, the underlying technology, and the broad context of the deal (see Appendix C). While the redaction increases the cost of information acquisition by competitors, at the same time, it sends an imperfect signal to competitors regarding a profitable market, reducing competitors' search and awareness costs. Observing such an agreement regarding a particular investment provides more precise information to peers than simply observing an increase in aggregate R&D investments.

Before documenting the learning effect, I first check whether there is higher information demand for redacted contracts. Using EDGAR log files, I collect download information for all material exhibits only in human-readable forms to mimic competitor downloads as a proxy for competitor attention. I find that the Streisand effect is in play: As shown in Figure 1, redacted material agreements are downloaded around 50% more than their unredacted counterparts starting from the first date they appear in the EDGAR system. This indicates greater attention to redacted agreements. Using contract-level data, I show that the greater attention is robust to the timing of a filing, along with time-varying firm characteristics that may determine the downloads of these filings. Greater attention seems to be persistent even within the same filing, i.e., a redacted material exhibit is downloaded significantly more than an unredacted exhibit attached to the very same filing (e.g., 10-Q), reassuring that other confounding factors do not drive the greater information demand.

Next, I test whether peers change their subsequent investment behavior or market entry decisions after observing the redactions by peers, which is consistent with the idea that peers learn from redacted contracts. To this end, I construct a panel using product market peers that I obtained from Text-based Industry Classification (TNIC) developed by Hoberg & Philips (2016). The database includes firm-peer pairs based on the textual similarity of their products disclosed in firms' 10-K filings for each given year, which allows me to dynamically measure the

movements between firm-peers in product space. In addition, I hand-collect information whether peers file redacted material agreements in a given quarter using the SEC EDGAR system, similar to prior studies (e.g., Bao et al., 2021; Heinle et al., 2022). My panel includes firm-peer pairs, whether peers have a confidential filing (or the number of confidential exhibits) in a given year-quarter, and product similarity scores of firm-peer pairs in a given year, together with quarterly accounting information of both firms and peers. I test whether redacted material agreements filed by a peer predict its rivals' future R&D investments and product similarity for a given firm-peer pair, abstract from the differences across firm-peer pairs, timing-specific effects along with time-varying firm- and peer-specific characteristics. This research design allows me to capture a firm's future response to a particular peer having a redacted filing in the given quarter compared to when there is no redacted filing by the same peer or alternatively a firm's movement toward a particular redacting peer while not to the others with no redactions.

The results show that firms increase their immediate one-quarter and one-year ahead R&D spending after peer redacted filings, abstract from any common shock to firm-peer pair in a given year[1]. More interestingly, I find that firms become more similar to redacting peers in product markets in the future despite the peer efforts to keep competitors at bay using redactions. Redacted peer disclosures lead to an increase of 9% of one-year ahead product similarity *change* between firm-peers. The results suggest that firms are encouraged rather than deterred from joining a similar market with redacting peers. The effect is persistent over 1- to 3-year ahead similarity change between firm-peers and robust to firm, peer, year-quarter, and firm#year fixed effects. Moreover, peer redactions do not seem to explain the lagged product similarity change (untabulated), mitigating any reverse causality concerns. I further find that innovation-related redacted contracts are mainly responsible for the observed increase in product similarity between firm-peer pairs.

I conduct a battery of robustness checks to ensure that the results are not susceptible to my design choices. The results are robust to an alternative treatment variable for peer redaction choice (i.e., the number of confidential filings) and the exclusion of firm-peer pairs having customer-supplier relationships that may affect firm product decisions without learning from

[1] Quarterly data on R&D investments allows me to use firm-peer-year fixed effects to control any common shock to a particular firm-peer pair competing in a similar product space. This can mitigate the reflection problem as discussed in Leuz & Wysocki (2016) and Roychowdhury et al., (2019).

peer disclosures. I also removed any confidential filings regarding *joint* projects that may explain the similarity of products of firm-peers abstract from firm learning. My inferences are again robust to this exclusion.

In additional analyses, I check whether firms always find it feasible to become closer to redacting peers. Particularly, I test whether the decision to join a similar market depends on firm-peer-specific relations or redacting peers' existing market structure. As opposed to the main results, I find that firms do not seem to find it optimal to join a similar product market if redactions come from *strong rivals* or rivals having already highly similar competitors, suggesting a deterrence effect instead.

Next, I focus on the redacting firms to check my assumption whether they redact to protect proprietary information that is useful for peers. Particularly, I test whether redacting firms show superior performance and more innovative behavior than non-redacting firms after redactions. In contrast, Bao et al. (2021) find that firms may exploit confidential treatments to conceal unfavorable contracting terms, consistent with managers withholding bad news (Verrechia, 1983; Kothari et al., 2009). In this case, the observed increase in peer investments might simply be an overreaction to misleading disclosures, as in Beatty et al. (2013). However, firms that invest in R&D, for example, tend to be smaller, less profitable, and, at the same time, have higher proprietary costs; therefore more likely to redact. A rise in R&D investments due to innovative activities may suppress the bottom-line profitability even more for growing firms (e.g., Joos & Zhdanov, 2008; Gu, Lev & Zhu, 2021). This may explain the weak future performance of redacting firms measured by bottom-line profitability in Bao et al. (2021). To this end, I particularly test whether redacting firms show instead higher operating profitability before R&D and depreciation, a measure used in earlier studies (e.g., Merkley, 2014). I also conduct within-firm analyses to control for any cross-sectional differences between redacting and non-redacting firms that may explain the poor performance documented using cross-sectional analyses in Bao et al. (2021). I find that redacting firms show higher operating profitability and become more innovative in the near future and the effect mainly comes from innovative types of contracts. I also show that the performance effect is attenuated for firms with higher product market fluidity, a measure for increasing product market rivalry. This suggests a wealth transfer between redacting firms and their rivals. Moreover, I find that product market

fluidity, a measure based on rival movements towards the firm, increases after redactions, consistent with my main results showing increasing similarity between firms and redacting peers.

Next, I explore the underlying *mechanism* that explains how redactions may facilitate peer learning. The strategy literature argues that limited attention due to cognitive capacity significantly influences decision-making in organizations (Eggers & Kaplan, 2009; Lavie 1995; Ocasio, 1997; 2011). Although the download analyses provide some evidence that increased competitor attention may play a role, it is still challenging to attribute the observed learning effect to rivals' increased attention to these filings. To this end, I exploit two quasi-natural experiments that provide reasonably exogenous variation in firm attention to test my hypothesis. First, I use exogenous CEO departures[2] from a rival firm as a firm-specific shock to its attention. Exogenous CEO departures are arguably a temporary shock to rivals' attention unrelated to peers' redaction choice, for instance, due to industry competition that might also be correlated with the board's decision to replace the CEO. Using the data provided by Gentry et al. (2021) on CEO departures, I test whether the learning effect attenuates when peer redactions coincide with exogenous CEO departures in rivals. I find that decreased attention due to CEO departures leads to a reduced impact of redacted disclosures on future R&D spending and product market similarity between firm-peers. This is consistent with the idea that increased rival attention in response to redactions might be one potential mechanism of peer learning.

Second, I use the financial crisis of 2008 as an economy-wide shock to rivals' attention on the basis that firms become irresponsive to attractive investment opportunities during the financial crisis (Campello et al., 2010). Similarly, I find that an economy-wide shock that averts firm attention to matters other than future investment opportunities reduces the effect of firm learning, further confirming the moderating role of firm attention on peer learning.

My study adds to the existing literature in several ways. First, my study contributes to the literature on corporate investment under uncertainty. Uncertainty surrounding investment outcomes that is particularly relevant for research and development investments might lead to investment inefficiencies. However, firms' actions to reduce this uncertainty are not extensively studied (Ferracuti & Stubben, 2019; Bernard et al., 2020). My study might improve our

[2] The literature suggests that exogenous CEO departures (e.g. death or departures due to health reasons) do not lead to a significant change in corporate policies, such as investment policy, in contrast to the departures due to performance reasons (Fee et al., 2013).

understanding of the role of information flow between firm-peers in facilitating capital allocation decisions.

Second, my study adds to our understanding of peer effects documented in the literature by showing a potential channel and mechanism of how firms learn from their peers' disclosures. Although information flows through public filings is shown to affect peer investments (Bernard et al., 2020), I show that redacted agreements might be a particular channel that facilitates peer learning. This answers the question of which specific peer information firms incorporate into their decision-making (Ferracuti & Stubben, 2019). Moreover, I also argue that competitor attention might be a potential mechanism that enables peer learning from redacted disclosures. Increasing disclosure overload (Chapman et al., 2019) and boilerplate public disclosures (e.g., Dyer et al., 2017; Kravet and Muslu, 2013) may urge peers to direct their limited attention to what is *worthwhile.* Despite the role of attention in decision-making in organizations (e.g., Eggers & Kaplan, 2009), the accounting literature examines the role of attention or information overload mostly from a capital market perspective, e.g., investor attention (see Blankespoor et al., 2021). To the best of my knowledge, the moderating role of attention in firm learning is not yet explored.

Third, my study extends the disclosure literature on proprietary costs. The theory and empirical literature on voluntary disclosures suggest that managers have incentives to withhold bad news (e.g., Verrechia, 1983; Kothari et al., 2009). However, in the presence of competitors, firms may still find it optimal to withhold favorable information when the proprietary cost of disclosure exceeds its benefits (e.g., Wagenhofer, 1990; Darrough, 1993; Guo, Lev & Zhou, 2003). The literature, however, does not generally distinguish the effects of proprietary versus non-proprietary disclosures on peers (Roychowdhury et al., 2019), possibly due to the challenges of identifying the true nature of observed firm disclosures. In the extreme, firms only disclose (withhold) stale (valuable) information, making it challenging to observe truly proprietary disclosures unless mandated by regulation. Redacted material agreements provide a unique setting in a large sample of firms to study the effect of proprietary disclosures on peer behavior. I show that firms can benefit from peers' proprietary disclosures even if redacted at the expense of redacting firms[3].

[3] Although peer firms seem to enjoy higher profitability, they also seem to suffer from expropriation from rivals as shown in redacting firm analyses.

Finally, my study also contributes to the growing body of literature on confidential filings. Although the determinants (Glaeser, 2018; Tian & Yu, 2018) or capital market effects (Verrecchia & Weber 2006; Heinle et al., 2022; Boone et al. 2016; Kankanhalli et al., 2021) of redacted filings are studied, to the best of my knowledge, my study would be one of the first to examine the effects of confidential filings on peers. My study differs from Chen (2021) by documenting different implications of redactions on peers, the contribution, and the methodology used to test my hypotheses. For one, although I confirm the results of an increase in R&D investments by peers, I fail to observe an increase in capital expenditures (untabulated) shown in Chen (2021). More interestingly, I show that peers become more similar to redacting peers, which is not shown in the subject paper. I also contribute to the accounting literature differently by documenting an important yet unexplored underlying mechanism in peer-learning, i.e. firm attention. Finally, my study uses a different but more rigorous methodology to mitigate the reflection problem, which is common in peer settings.

2. Institutional Setting and Literature Review

2.1. Confidential Filings

The SEC mandates US public firms to publicly disclose their material contracts while allowing them to redact/omit certain information from these contracts due to competitive harm. When a firm opts to redact a material contract due to proprietary concerns, it first publishes the contract in the *redacted form* as an exhibit (typically exhibits 10.XX) to its regular filings (e.g., 10-K, 10-Q, 8-K, etc.) through the EDGAR system. At the same time, it also requests *confidential treatment* by providing a complete (unredacted) version of the contract to the SEC for approval[4]. The SEC may approve, ask for an amendment, or deny the request. If approved (or denied), the SEC issues a confidential treatment order (Form CT Order), which is made public through the EDGAR by the SEC after May 1, 2008. A typical CT Order includes information regarding the exhibit (e.g., Ex-10.15), the type of the form (e.g., 10-K) and filing date of the redacted filing, and the date when the CT Order expires (usually several years). Firms can also ask for an extension to a redaction before, also approved and published by the SEC. A single CT

[4] The SEC has changed the application and approval process starting from March 2019. Before the change, firms were required to seek approval and subject to ex-ante monitoring by the SEC. With a recent change, the SEC now allows firm to redact information without approval but with an ex-post monitoring. See https://www.sec.gov/corpfin/confidential-treatment-applications for more information.

Order may contain information about several redacted filings and/or exhibits and whether the request is about an extension to a prior filing.

Firms may censor pricing terms, milestone payments, technical specifications of products, patent information, and/or the research undertaken. While doing so, firms also disclose the nature of the contract, whether it is redacted or not, by usually making it visible which exhibits are subject to confidential treatment under the list of exhibits of the corresponding filing. Appendix C provides an excerpt from a redacted agreement between Arcturus Therapeutics, Ltd. and Millennium Pharmaceuticals, Inc filed as the Exhibit 10.15 of 10-K on 18 March, 2019 by Arcturus Therapeutics, Ltd. (CIK: 1566049). Although the redactions are marked up by […***…] that makes them nonvisible, the contracting parties, the underlying technology (e.g., *"lipid nanoparticle technology", "mRNA designs and processes"*), and the overall purpose of the agreement *("conduct the research …. for the purpose of generating, producing and/or optimizing therapeutic mRNA molecules"*) are identifiable from non-redacted portions of the agreement.

2.2. The Background and Literature

Investment under uncertainty and peer disclosures

In a frictionless world (such as Modigliani & Miller framework), investments are primary sources through which firms create value for investors. However, uncertainty can reduce managers' appetite to undertake positive NPV projects even absent information asymmetry (e.g., Dixit & Pindyck, 1994; Bloom et al., 2007). In this case, firms may pursue a *'wait and see'* strategy since delaying an investment would allow managers to observe the outcome of an investment before irreversibly committing resources (Bernanke, 1983).

A considerable amount of research examines the sources managers incorporate into their investment decisions (e.g., Badertscher et al., 2013; Bustamante & Frésard, 2021; Ahci, Martens, and Sextroh, 2022). Peer disclosures may aid firms in resolving the uncertainty surrounding their investment outcomes since peers are affected by similar economic factors (e.g., demand shocks or growth opportunities). Competitors may use peer financial reporting to identify *promising new opportunities* (Bushman & Smith, 2001). Badertchser et al. (2013), for instance, show that private firms are more responsive to investment opportunities when there is a greater public firm presence in their industry, suggesting that mandated peer disclosures reduce the overall uncertainty in an industry.

The growing body of literature on the effects of peer disclosures on firm investment misses several important aspects. First, although the literature shows an association between firm disclosures (e.g., financial reporting quality, R&D spending, etc.) and peer investments (e.g., Bustamente & Fresard, 2021), which *specific characteristics*[5] of disclosures may help peers' decision-making are not extensively studied (Ferracuti & Stubben, 2019; Roychowdhury et al., 2019). Therefore, exploring underlying learning channels that help firms reduce the uncertainty surrounding their investments would add to our existing knowledge of peer effects. For instance, using downloads of EDGAR filings (e.g., 10-K filings) by peers, Bernard et al. (2020) show that information flows can explain peer investment decisions. However, which specific parts of these filings are useful for peer decision-making remains unanswered (Roychowdhury et al., 2019). I argue that detailed textual disclosures[6] regarding material contracts might be a particular channel that facilitates peer learning. Observing such a contract regarding a specific investment (even redacted) may provide more precise information to peers than simply observing an increase in aggregate R&D spending.

Second, the literature does not generally distinguish the effects of proprietary versus non-proprietary disclosures on peer investment behavior[7]. I believe this is partly because of the difficulty of finding suitable settings where the nature of a given disclosure (proprietary or not) is clearly identifiable. For instance, the theories on voluntary disclosure suggest that firms withhold favorable information when the proprietary cost of disclosure exceeds its benefits[8] (e.g., Wagenhofer, 1990; Darrough, 1993). In the extreme, firms only disclose (withhold) stale (valuable) information. Put differently; observed firm disclosures are not truly proprietary unless mandated by regulation, making it challenging to identify settings with proprietary disclosures. Redacted material agreements, in which the disclosures are mandated by regulation, provide a unique setting to study the effect of proprietary disclosures for a large sample of firms since the redaction of information is due to proprietary concerns[9].

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[5] For example, do peer firms look at profitability, cost, and/or segment disclosures? Are textual disclosures more informative than financial statement items? If so, which specific part is more informative for competitors?

[6] Basu et al. (2022), for instance, show that investment opportunity measure created using textual disclosures (10-Ks) outperform Tobin's q in predicting future investments.

[7] Two exceptions are the studies by Krieger (2021) and Zhang (2020). These studies, however, examine the effects of proprietary disclosures on peer investments either in a voluntary setting and/or in a specific industry using disclosures regarding clinical trials in pharmaceutical industry.

[8] On the one hand, disclosure of favorable information may reduce cost of capital and increase prices. On the other hand, opponents (e.g. competitors, regulators, etc.) can use this information to harm the disclosing firm.

[9] Firms can still exploit the regulation to conceal bad news. Bao et al (2021), for instance, argue that firms may use confidential filings to conceal bad contracting terms. However, the redactions are only allowed for proprietary

The mechanism behind learning from disclosures

We have a limited understanding of how firms react to peers' relative *non-disclosure* behavior, especially when this behavior is *observable*. Whether firms can learn from their rivals' redacted disclosures is ex-ante, not clear. On the one hand, conventional wisdom suggests that the redaction of proprietary information makes the remaining portions of such contracts redundant, which would hinder competitor learning as intended. On the other hand, the redaction choice itself is a disclosure that signals something valuable[10] is hidden, creating a stronger motive for rivals to unravel the information concealed in the contracts. While the redaction increases the cost of information acquisition by competitors, at the same time, it sends an imperfect signal to competitors regarding a profitable market, reducing competitors' search costs. For instance, assume that a firm enters new contractual agreements or strategic partnerships to develop a new technology that might disrupt the market. In order to protect its intellectual property or strategic plans[11], the firm chooses to redact a part of the contract but cannot hide it entirely since the disclosure is mandatory. This concealment behavior is instantly observable by outsiders and may leak information to competitors regarding the firm's investment outlays or strategic plans. This may, in turn, induce rivals to extract more information from these contracts, increasing rivals' information production and learning.

Moreover, despite growing evidence in peer learning, the underlying *mechanisms* through how disclosures show its effects on peer investment behavior received little attention. I argue that *firm attention* to redacted disclosures might be a particular mechanism that can explain how redacted disclosures enable peer learning. The strategy literature argues that limited attention due to cognitive capacity significantly influences decision-making in organizations (Eggers & Kaplan, 2009; Lavie 1995; Ocasio 1997; 2011) [12]. The effect of firm attention on learning might be particularly relevant in the disclosure setting considering the critiques of increasing disclosure overload (Chapman et al., 2019) and boilerplate public disclosures (e.g. Dyer et al., 2017; Kravet

reasons and also audited by the SEC (See Section 3 for institutional details). I revisit the effect of redactions on disclosing firm performance in Section 6.

[10] Since withholding information is punished by capital markets (e.g. Verrechia & Weber, 2006), I expect that firms only redact to protect their valuable assets due to competitive harm..

[11] The literature, for instance, finds that firms withhold information internally developed innovations especially when they are at development stage (e.g., Guo, Lev and Zhou, 2004)

[12] Accounting literature, however, approaches attention or information overload mostly in a capital market setting (see Blankespoor et al., 2021). One exception might be a recent study on the effect of attention in analyst setting by Du (2021), who show that distracted female analysts strategically allocate their limited attention to forecasts of firms with high institutional ownership.

and Muslu, 2013). Upon observing redacted disclosures, firms may direct their limited attention to what is *worthwhile* in peer disclosures. This is analogous to the *'Streisand effect'*[13], a phenomenon that is used to explain the counterproductive consequences of censorship. Despite its fit into the disclosure setting, the Streisand effect has received limited attention except for a few studies in non-accounting fields[14]. Contrary to firms' desire to keep rivals at bay, censoring behavior may increase competitor awareness and induce them to snoop more on these disclosures, increasing peer learning if firms can unravel the hidden information. To the best of my knowledge, the moderating role of competitor attention on peer learning is yet to be explored.

The literature on confidential filings

Prior studies show that firms redact to protect their own proprietary information (Glaeser, 2018; Boone et al., 2016; Kankanhalli et al., 2021), especially in dynamic product markets (Tian & Yu, 2018), or to protect their customers' proprietary information (Chen et al., 2022). Others examine the capital market consequences of the redaction choice. While Verrechia & Weber (2006) show that redactions lead to an increase in adverse selection and lower market turnover, others find a favorable market response to redactions (Kankanhalli et al., 2021; Lee, 2019). In addition, several studies show that firms increase their voluntary disclosures (Heinle et al., 2022; Barth et al., 2020) to mitigate the negative consequences of withholding information. Finally, consistent with the notion of managers withholding bad news (e.g., Kothari et al., 2009), Bao et al. (2021) find that firms exploit the regulation to conceal the bad contracting terms. As pointed out before, the effect of redactions on peer investment behavior, however, is not extensively studied.

3. Research Design and Empirical Analyses

I conduct two sets of empirical analyses. I first test whether peers change their subsequent investment behavior or market entry decisions after observing redactions by peers. In

[13] Attributed to American singer Barbra Streisand, the 'Streisand effect' is a phenomenon to describe unintended consequences of withholding information. An attempt to suppress photos of her private property unintentionally increased the awareness of public of the existence of these photos. The concealment behavior attracted more attention and resulted in greater awareness by the public.

[14] Hagenbach & Koessler (2017) model the Streisand effect in a signaling game. They find that censorship sends a signal to receivers that motivates them to unravel what is hidden, resulting in higher chance for revelation. Several studies in political economy (e.g. Hobbs and Roberts, 2018; Glàßel & Paula, 2020) also examines the consequences of government censorhip. They find that the censorship in general backfires and induces citizens to unravel information using alternative resources, especially when they are able to detect misinformation.

the following sections, to explore the underlying mechanism of peer learning from redacted disclosures, I further test whether redacted material exhibits receive more attention than their non-redacted counterparts and how shocks to firm attention impair the ability to learn from these disclosures.

3.1. Data and Sample Construction

I begin by identifying 12,664 confidential treatment orders published on the SEC EDGAR website between May 1, 2008 and December 31, 2018. Then, I parse the text of these confidential treatment orders using python scripts to locate the filings, including the exhibits redacted. Particularly, I collect the data regarding the Central Identification Key (CIK) of the filing company, the filing date, and the form type of the relevant filing and exhibit. I also determine the nature of the CT Order, whether it is about granting, denial, or an extension to a prior filing. Following the literature on confidential filings, I exclude denial and the extensions to prior filings. I further exclude confidential exhibits filed with form types other than 10-K, 10-Q, or 8-K. This leaves me with 9,625 confidential treatment orders with a total of 16,397 exhibits filed under 9,729 distinct filings (See Table 1 - Sample construction).

3.2. Sample

The sample covers the years between 2008 and 2018. The sample begins in 2008 because the SEC made CT Orders available in 2008. The sample ends in 2019 because the rule to seek approval from the SEC for redacted disclosures has changed in 2019, which reduces the observability of redacted filings using CT Orders[15]. In addition, for download analyses, I restrict the sample to the filings between 2008 and 2016 since EDGAR log files are available until June 2017. Since my aim is to investigate whether the information disclosed in redacted filings is used as input by rivals for their investment decisions, identifying firm-peers competing in similar product markets is essential. To this end, I use Hoberg and Phillips (2016) text-based network industry classification data (TNIC3 industry). The data provides information regarding firm-peers and their corresponding product similarity extracted using the product descriptions in

[15] "*In March 2019, the Commission changed several of its exhibit filing requirements to allow companies to omit immaterial, competitively harmful information without having to provide the information to the Commission and request staff approval of the omissions."* See https://www.sec.gov/corpfin/confidential-treatment-applications for details.

yearly 10-K filings. The advantage of this industry classification system compared to static Standard Industrial Classification (SIC) is that the TNIC industries can capture even minor competitors and provide dynamic (time-varying) information regarding firm-peer similarity in product space. Moreover, it allows me to identify whether the same firm moves toward a particular peer in a product space but not to the others based on their disclosure policy.

Moreover, I use CRSP-Compustat merged data from quarterly files for quarterly company financials. Using quarterly data allows me to identify the timing of redacted filings and the change in R&D investments more precisely and use a more granular fixed effects structure. Finally, I merge quarterly financials data with firm-peer pairs that I obtained from TNIC3 industry data by aligning the similarity data from $q+1$ to the following year's $q+1$. This is because 10-Ks that is used to construct the similarity measure are mostly available in the first quarter following the calendar year-end. I also remove financial and utility firms from my sample. The final sample consists of around 9.7 Million firm-peer-quarters over the sample period, with confidential treatment requests of 6,724 filings and 11,503 exhibits filed by peer firms.

In average, 12% of sample firms redact at least once, and the ratio of redacting firms stays relatively stable through time. Redacting firms redact, on average, 1.45 filings and 2.48 exhibits in a given year. See Table 1 for details.

[INSERT TABLE 1]

3.3. Regression Model

To document the learning effect, I test whether firms change their investment behavior after observing redacted filings by peers. For this section, I use two different dependent variables to proxy firm investment behavior. First, I focus on R&D spending because prior literature shows that firm expansion and growth, and differentiation in product market decisions are realized mostly through R&D investments (e.g., Hoberg & Philips, 2021). Particularly, I first test whether firms increase their R&D spending after observing a redacted disclosure, which may signal that firms actively respond to peer redacted disclosures. Second, I use product similarity between firm-peers as a proxy for firms' investment outcomes. Particularly, I test whether the distance between firm-peers in product space changes after redactions by peers. For instance, if a

peer successfully protects its valuable innovation using redactions and, as a result, diversifies from its rivals in the future, the distance between the peer and its rival firms is expected to increase. On the other hand, if rival firms are encouraged to join a profitable market signaled by redactions of peers, the distance between firm-peers may even decrease[16].

The model to test for subsequent firm investment behavior is given as follows:

$$Investment_{i(j),t+T} = \beta_0 + \beta_1 . confidential\ dummy_{ijt} + \sum Firm\ Controls_{i,k} + \sum Peer\ Controls_{j,l} + \sum FEs + \varepsilon_{ijt}$$

I use two different measures for $Investment_{ij,t+T}$. First, I use two different R&D variables; immediate one-quarter R&D intensity and the sum of four subsequent quarter R&D spending scaled with the total assets in the current quarter to mitigate seasonal effects in R&D spending, e.g., due to earnings manipulation (Graham et al., 2005; Roychowdhury, 2006). Second, I use $\Delta Similarity_{ji,t+T}$, which is the change in product similarity between firm *i* and peer *j* calculated as $similarity_{i,j,t+T} - similarity_{i,j,t}$. This variable measures to what extent a firm's product portfolio becomes similar to those of its peers in the future after redactions. The variable of interest is $confidential\ dummy_{j,t}$, which takes a value of one if the firm observes at least one confidential exhibit by its peers in a given quarter[17]. The positive (negative) coefficient β_1 implies that firms increase (decrease) their R&D spending or alternatively become more similar (distant) to redacting peers in product space following redacted filing. I further include a battery of time-varying firm and peer characteristics such as Size, R&D intensity, a dummy for missing R&D, MB, Leverage, ROA, and LOSS dummy that may correlate with firm investment and peer disclosure behavior. I also add the current similarity between firms and peers in the regressions to control any effects arising from the current proximity between firms and peers. All variables are winsorized at 1% level.

In addition, quarterly accounting data allows me to use a highly granular fixed effects structure. Specifically, I include firm-peer fixed effects to control time-invariant differences

[16] Alternatively, firms may also be deterred by rival disclosures thinking that they lost the competition race. In this case, firms can still learn from rivals' redactions but instead are deterred to join a similar market that shows its effect in higher distance (lower similarity) between firm-peers. In additional analyses section, I explore the cases where competitors may not find it optimal to compete in similar markets even though they can learn from redacted disclosures.

[17] In robustness checks, I use the number of confidential filings in a given quarter as an alternative treatment variable.

across firm-peer pairs and year-quarter fixed effects to control any specific time effects (e.g. wide economic shock) that may coincide with peer redacted disclosures and explain future firm investment behavior. Even with this fixed effect structure, documenting a causal relation between redacted disclosures and peer learning is challenging due to the *reflection problem*, as discussed in Leuz & Wysocki (2016) and Roychowdhury et al. (2019). The reflection problem may arise mainly because the selection of a firm and its peers competing in a similar product space is not random. Time-varying common latent factors, such as a shock in growth opportunity to a particular industry, may affect both peer redaction choice and firm investment behavior. In this case, private information of the firm and its peers is correlated, and the positive association between peer redacted filings, and the firm's future investment behavior may not necessarily be a result of active firm response to peer disclosures.

In order to overcome this challenge and sharpen my identification, for only R&D analyses, I include firm-peer#year fixed effects to control any common shocks to both firm and its peers in a given year in a particular product space. In this case, the variation comes from the quarters with confidential filings in a given firm-peer-year. By this, I am able to test the effect of the peer confidential filings on a firm's future R&D investment, abstract from any time-varying firm-peer specific characteristics that may confound the learning effect. For similarity analyses, I alternatively use firm#year fixed effects to control for a shock to firms' growth opportunity that may explain firms' future investment behavior and that may coincide with peer redaction choice[18].

This setting allows me to identify whether firms chose to become more similar (distant) to redacting peers but not to non-redacting peers in a given year. Moreover, it also allows me to identify when firms chose to become similar (distant) to a specific peer while keeping time-invariant firm-peer specific factors constant.

[18] I cannot use firm-peer#year fixed effects for similarity analyses because in this case no variation remains in product similarity between firm-peers since the measure is available only yearly basis.

4. Empirical Results

4.1. Redacted Filings and Subsequent Investment Decisions

4.1.1. Main Results

Table 2 shows the results of peer effects on future R&D investments and 1-, 2-, and 3-year firm-peer product similarity with different fixed effects across columns. The results for R&D analyses are shown in columns 1-2 of the Table[19]. Upon observing redacted disclosures, firms, on average, seem to increase their R&D spending in the subsequent quarter and year. More surprisingly, firms seem to move towards redacting peers in the product space despite rivals' efforts to protect their private information. The coefficient on the confidential dummy is consistently positive and significant across columns (Columns 3-8). This is consistent with the notion that firms learn from redacted disclosures and join a similar market with redacting peers. Although small in magnitude, the coefficient is economically meaningful. Redacted peer disclosures lead to an increase of 0.6% of the average product similarity (6%) in my sample. However, the effect climbs to 9% of the average product *similarity change* between firm-peers in a year, which is quite substantial. The effect is persistent over 1- to 3-year ahead of product similarity change between firm-peers and robust to various fixed effects[20].

[INSERT TABLE 2]

4.1.2. Redacting Firm Performance

In this section, I test my assumption that rivals' redaction choice stems from protecting proprietary information (e.g., Boone et al., 2016; Glaeser, 2018) that is valuable to the peers rather than the intention to conceal bad contracting terms (Bao et al., 2021). For these analyses, I focus on disclosing firms and test whether redacting firms show superior performance and become more innovative after redactions[21].

[19] Untabulated analyses show that the results are qualitatively similar when a dummy for innovation related confidential contracts is used instead of the dummy for confidential filings.

[20] In untabulated analyses, to mitigate any reverse causality concerns, I also use the lagged change in product similarity (from t-1 to t) as the outcome variable. For instance, firms may choose to redact filings when the product market is dynamic (Tian & Yu, 2018), i.e., when other firms become closer to disclosing firms. In this case, the positive change observed in product similarity might be a cause but not the result of peer redaction choice. The result in Column 8 shows that this is not the case i.e. firms do approach redacting peers in product space after their confidential filing but not before (the coefficient is negative).

[21] Using proprietary data on licensing contracts, Kankanhalli et al. (2021) suggest that firms redact to protect their impending innovations and redactions are followed by greater innovative activity. They also show that the redaction choice is well received by the capital market, especially by *innovation-oriented* investors.

First, I test whether redacting firms show higher future profitability relative to non-redacting counterparts. In contrast, using cross-sectional within industry analyses, Bao et al. (2021) show that redacting firms, on average, show negative 1-year future profitability, which supports the idea that firms exploit confidential treatments to conceal unfavorable contracting terms. However, firms that invest in R&D, for example, tend to be smaller, less profitable, and, at the same time, have higher proprietary costs; therefore, they are more likely to redact (e.g., Glaeser, 2018). Since increasing R&D spending may suppress the bottom-line profitability even more for younger and innovative firms that also redact more, I use operating income before R&D instead as my dependent variable, similar to earlier studies (e.g., Merkley, 2014). For the reasons explained above, I also conduct within-firm analyses to control for any cross-sectional differences between redacting and non-redacting firms.

[INSERT TABLE 3]

The results in Table – 3 show that redacting firms show higher operating profitability (Column 1) starting the year when they disclose redacted agreements[22] , and this effect mainly comes from the innovation related redacted contracts (Column 3). Interestingly, although still positive, the effect of innovative contracts becomes less significant after one year (Column 4). Further analyses (Column 5) show that the overall effect on future profitability is partly offset for firms with higher product market fluidity, a measure of rivals becoming closer to redacting firms in product space. These results suggest a wealth transfer between redacting firms and their competitors that join a similar market after observing redacted agreements.

Furthermore, the main analyses show that firm and redacting rivals approach each other in product space in the future. However, the direction of this proximity may not be clear: Redacting peers may also approach its rivals, increasing the similarity between the firm and peers. If, instead, competitors become closer to redacting firms, one should observe greater product market fluidity in the future since this measure depends on rival movements rather than firms' movements in product space. To this end, I test whether the product market fluidity of redacting firms changes after redacted agreements. The results in Table 3 (Columns 6-7) show that the coefficient on the confidential dummy is significant and positive for one year ahead fluidity after redaction but not for the current year market fluidity while controlling lagged

[22] Untabulated results show that confidential agreements is not positively associated with one-year lagged operating profitability that further mitigates concerns for reverse causality.

fluidity. This indicates that rivals invest in similar markets and become more similar to redacting firms in the future.

Finally, I test whether redacting firms introduce more innovative terms in their product descriptions in the future. Ahci & Joos (2019) created a text-based innovation measure using 10-K business descriptions that explain future sales growth and profitability. Using their innovation measure, I test whether redacting firms use an innovative type of vocabulary in the future. For this analysis, I focus on licensing and R&D types of confidential contracts. The results (Columns 8-9) show that firms become more innovative after redacted innovative contracts, suggesting that firms conceal information that is proprietary in nature, consistent with the results in Kankanhalli et al. (2021).

4.1.3. Robustness Checks

I conduct a battery of robustness tests to check whether my results are susceptible to several factors relating to my research design choices. To ensure the observed relation is not simply due to the treatment variable choice, I use an alternative variable to measure the effect of redacted disclosures on firm learning. Specifically, I use the natural logarithm of the number of confidential filings instead of using a dummy variable. The results in column 1 of Table 4 show that my inferences hold and are not sensitive to the choice of my treatment variable.

[INSERT TABLE 4]

Moreover, I remove from my sample firm-peers that have a customer-supplier relationship. For instance, Chen, Tian & Yu (2022) show that supplier firms redact filings in line with their customer disclosure policies. Moreover, firms may adjust their product portfolio based on customer-supplier relationships without learning from each other's disclosures. Normally, firm-peer fixed effects control any effects from the static relationship between the firm and its peers but still may fail to control time-varying relationships between firm-peers. So, I remove firm-peer-years with customer-supplier relationships from my sample to mitigate any concerns regarding dynamic customer-supplier relationships that may affect firms' product market decisions without learning. I use the supplier-customer data by WRDS to identify firm-peer pairs having a customer/supplier relationship in a given year. Removing these pairs, I rerun my analyses. Column 2 shows that the results are robust to this exclusion.

Another concern might be the joint projects undertaken by firm-peer pairs. In this case, the observed relation might simply result from collaborative work but not learning from

disclosures. To this end, I exclude all 'peer' types of confidential contracts[23] from my sample to remove such effects. My inferences do not change as well (column 3).

I categorize the redacted filings based on their type. I decompose the confidential filings into their contract types and check which type of contracts might be useful for peer learning, similar to the literature (e.g., Boone et al.; 2016). For example, contracts with more proprietary data might be more informative to firms than other contracts. I first download the text of confidential contracts and search for certain keywords using regular expressions to determine the type of contract. Unlike prior studies, however, I combine innovation-related contracts (such as R&D, patent, royalty etc.) into one category as "License & RD". In line with the literature, "Purchase & Sale" and "License & RD" contracts share the top and are followed by "Credit & Lease", "Investment & Merger", and "Employment" contracts.

I regress the product similarity change between pairs on the type of the confidential agreement. It seems that the innovation-related (licensing, R&D) contracts explain the positive coefficient on the confidential dummy. Interestingly, however, the finance and employment type of contracts also seem to explain the positive relation between confidential filings and subsequent firm investment decisions. The result for financing agreements is consistent with the predating behavior of rivals documented in Bernard (2013), which suggests that product market rivals force financially constrained firms to exit. Learning from confidential financing agreements, firms may take the market away from competitors having financing constraints. Moreover, confidential employment agreements may convey valuable information to firms regarding peers' human capital investments beyond financial statements, which is argued to support firm growth (e.g., Lev & Zarowin, 1999). Overall, the results further strengthen my inferences that firms extract valuable information from peers' redacted disclosures and actively respond to these disclosures by changing their investments and product portfolio, suggesting a learning effect.

4.1.4. Additional Analyses and Moderating Effects

This section analyzes whether the learning effect is sensitive to some specific firm and firm-peer-specific characteristics, including competition.

The increase in R&D spending in main analyses may depend on some firm-specific characteristics. I test whether the observed R&D increase changes with the firm size. On the one

[23] The contracts with titles including ‘collaborative’, ‘collaboration’, ‘cooperation’, ‘cooperative’, ‘joint’, and ‘strategic alliance’ and their variants.

hand, firms may undertake additional investments to join a profitable market that they learn from their peers. This would manifest in an increase in R&D spending, at least in the short term. But, on the other hand, firms may substitute the *new* profitable market with the *old* non-profitable ones or projects with a high probability of failure or uncertainty. In this case, a rise in R&D spending for the new market would be offset by a decrease in expenditures for other existing projects firms decide to forgo, making the R&D increase unobservable. Ciftci & Cready (2011) show that larger firms with R&D investments enjoy lower earnings volatility compared to smaller firms due to the ability to diversify R&D investment risk better. Having many projects in their pipeline, larger firms have the ability to substitute an opportunity that they learn from peers with their existing projects, making the change in R&D investments less visible.

To check whether an increase in R&D changes with firm size, I interact confidential dummy with the firm size. It seems that the effect on R&D is attenuated for larger firms (Table 5 - columns 1 and 2) both for one-quarter and on-year ahead R&D, consistent with the idea that larger firms are better able to substitute the opportunities learned from peer disclosures with the ones in their existing portfolio.

[INSERT TABLE 5]

Next, I examine whether the increasing similarity between a firm and redacting peers depend on the characteristic of firm-peer-specific relationship and the competitive forces. For example, firms may find it challenging to compete with stronger rivals (Zhang, 2020) even if they are able to decipher the signal they receive regarding profitable markets. To test this, I create a dummy variable, *strong rival*, which takes the value of one when peer size is larger than the firm size (in terms of market value). Peers might be a strong rival for a subset of firms while being a weaker rival for other firms at the same time. This variable can identify such firm-peer-specific relations. The result in Column 3 shows that the interaction effect of the strong rival dummy is negative and significant, suggesting that firms indeed do not prefer to join the same market when disclosures come from strong rivals. This implies that firms can still learn from rival disclosures, but instead, they are deterred from investing in similar markets[24].

[24] A natural question may arise why firms choose to redact in the first place if the disclosure can deter rivals. Given the heterogeneity in rival characteristics (the mixture of weak and strong rivals), firms may still find it optimal to redact to protect their intangible capital against strong rivals.

Second, firms may consider the current market structure of peers before making investment decisions based on what they learn from redacting peers. For example, firms may find it less attractive to join already crowded markets where too many players compete. To test this, I use the *Total Similarity* measure by Hoberg & Philips (2016), which measures the aggregate similarity of rivals for a given firm in a year. The result in Column 4 shows that firms find it less attractive if redacted disclosures come from a peer with greater total similarity, i.e., when the market is already crowded, and the competition is too high. One possible explanation is that firms may find it less worthy to enter a market where the profit margins are relatively small. In Column 5, I also find that confidential filings are especially informative for peers when the redactions accompany an increase in R&D spending in the same quarter.

Finally, I check whether information frictions between firms and their peers play a role in subsequent investment decisions in response to redactions. The literature shows that the distance between rivals may play an essential role in technology spillovers due to, e.g., the interfirm mobility of inventors (Almeida & Kogut, 1999). Managers may possess greater knowledge of other firms in the same geographic area (Jaffe, Trajtenberg, and Henderson 1993). On the one hand, local firms may have a better capacity or resources (e.g., due to less information frictions) regarding rivals than non-local firms, making it easier to unravel what is hidden in redacted disclosures that increase the learning effect. On the other hand, local firms may already be informed about the underlying technology that rivals attempt to hide. In this case, the learning effect would be attenuated for local firms. To test whether the distance between a firm and rivals have an effect on firm learning, I collect the state of incorporation data from Compustat[25]. I generate a dummy variable *same state* when the firm and its peer share the same state of incorporation. The results shown in Column 6 suggest that being in the same state has a negative effect if any (p-value = 0.13), on firm learning, which is in line with the idea that firms may already have superior knowledge about what is concealed in the contracts compared to non-local firms. However, the negative relation provides further assurance against a possible concern that the observed relation is simply a result of a common demand shock since local firm-peers are more likely to be affected by similar demand shocks than non-local firms.

[25] One way to collect state of incorporation is to look at company filings to get historical information since Compustat only keep the latest records regarding state information but fail to provide historical changes. Since my sample covers relatively small time period, I do not think that collecting data from company filings may alter my inferences.

4.2. Attention Mechanism

In this section, I explore whether increasing awareness and attention might be a potential mechanism to facilitate peer learning from redacted disclosures. In my first analysis, I attempt to show whether information demand is higher for redacted filings compared to non-redacted contracts. Next, I exploit two plausibly exogenous shocks to firm attention to test whether a distraction to firm attention impairs the firm's ability to learn from redacted disclosures by peers.

4.2.1. Download Analyses

I use EDGAR log files that include detailed information about the download of public firms' filings at the SEC. Prior studies using EDGAR server log files (e.g., Drake et al., 2015; Bernard et al., 2020; Hollander & Litjens, 2020) capture the download of filings by the document accession number. However, EDGAR log files contain more granular information per 'extention' level . This unique feature allows me to compare the downloads of confidential exhibits relative to their non-confidential counterparts, even within the same filing/accession (e.g., 10-Q). This comparison, however, requires additional effort to identify exhibits' links (filename), including those of non-redacted ones, since EDGAR log files do not provide information about the nature of exhibits . In order to identify all material exhibits (redacted + non-redacted) and their 'extention' (filename), I use EDGAR index pages of each 10-K and 10-Q filing. I merge the data from index files with EDGAR log files using the accession and filename (extention) and only keep material exhibits. By this, I identify the information regarding the number of downloads and the nature of each material exhibit.

To mimic downloads by competitors, I first followed a procedure similar to the literature to exclude machine downloads (e.g., Drake et al., 2015). Second, I only use downloads of exhibits in human-readable forms (i.e., html, htm, or .pdf), excluding the text files containing html codes such as complete submission files. This should further eliminate possible downloads by sophisticated investors. Although I cannot rule out the possibility that these downloads may include the downloads by other parties (e.g., retail investors), I believe the procedure allows me to mimic competitor downloads reasonably. Investors are more likely to use other platforms (i.e.,

Bloomberg terminals) or information intermediaries to access company filings (Drake et al., 2015) relative to competitors.

The first descriptive evidence for greater attention to redacted filings is depicted in Figure 1. The figure shows the cumulative downloads of redacted vs. non-redacted material exhibits up until six months after their filing. The figure clearly shows that redacted material exhibits receive more attention than non-redacted material exhibits starting from day 0 and continue to follow a similar pattern during the six months. However, the depicted figure may simply arise because of certain characteristics of firms that file redacted exhibits or time-varying firm disclosure behavior that correlates with the number of downloads. To control the effect of other confounding factors, I regress the logarithm of the number of downloads to a dummy variable that takes the value of one if the material contract is redacted. Here the unit of analysis is the contract (exhibit) level. In different models, I use a variety of fixed effects to control omitted correlated variables that may affect both filing downloads and firms' disclosure choices. I use firm and year-quarter fixed effects to control for any time-invariant firm characteristics and timing effects. Moreover, for concerns regarding time-varying firm characteristics driving both the downloads of firms and their disclosure choices, I use firm#year-quarter fixed effects. For instance, innovative and growing firms may both receive more attention (downloads) and at the same time, choose to redact filings due to proprietary concerns. Finally, to further sharpen the identification, I include filing FE in the model and conduct *within-filing* analyses to compare the attention to redacted filings to their non-redacted counterparts within the same filing (e.g., 10-K) while keeping any filing-related factors constant.

[INSERT FIGURE 1]

The results reported in Table 6 confirm what is depicted in Figure 1. The positive coefficients on confidential exhibits in Columns 1-4 show that redacted material contracts receive, on average, 43-52% more attention compared to their non-redacted counterparts. The documented effect is robust to a variety of firm and time-specific characteristics, including total downloads of the main filing (e.g., the text of 10-K). Even within the same filing, redacted exhibits receive 43% more attention than non-redacted exhibits (Column 4).

[INSERT TABLE 6]

One might argue that redactions may simply capture some firm-specific characteristics, such as higher agency costs, which might explain higher downloads for redacted exhibits. If so, one should observe a similar pattern for the downloads of main filings containing redactions. The results in Columns 7-8 show that this is not the case: There is no evidence that main filings with redacted exhibits receive more attention compared to filings with no confidential exhibits. The coefficient on main filings with redacted exhibits is even negative[26] and becomes insignificant when controlled for only firm fixed effects. Taken together, the results show that redacted material exhibits receive significantly greater attention compared to non-redacted material exhibits abstract from the firm-, time-, and filings-related factors.

Finally, similar to the main analyses, I decompose the confidential dummy to its contract type to test whether the type of contract is a determinant of greater attention to these filings. Results in columns 5-6 show that confidential filings receive greater attention independent of their type (except Service&Consult contracts). This further supports the notion of the Streisand effect and mitigates concerns that confidential filings receive greater attention simply because of the type of contracts that are more likely to be redacted (such as R&D-related contracts) and downloaded.

4.2.2. Quasi-natural Experiments on Firm Attention

It is challenging to find exogenous variation in firm attention that is uncorrelated with peers' disclosure policy. One possible setting is to use CEO turnover as a firm-specific shock to attention. However, replacements of CEOs may not be exogenous to peer disclosure policy. For instance, boards' decision to replace CEOs may correlate with the performance of firms relative to peers (Eisfeldt & Kuhnen, 2013) or a competition shock (Dasgupta, Li, & Wang, 2018) that may, at the same time, co-determine peers' disclosure (redaction) choice. The literature suggests that exogenous CEO departures (e.g., due to death or health reasons) do not lead to significant changes in corporate policies, such as investment policy, in contrast to the departures due to performance reasons (Fee et al., 2013). Exogenous CEO departure (and subsequent new hiring) is arguably a temporary and firm-specific shock to attention that may impair firms' ability to learn from peer disclosures and abstract from peer performance or industry-level shocks.

[26] This is consistent with the idea that smaller firms are more likely to redact filings (Heinle et al., 2022) that might also explain lower filing downloads.

Therefore, I use exogenous CEO turnover as a setting to test whether underlying firm attention affect firm learning from peers' (non-)disclosures.

To this end, I use the data provided by Gentry et al. (2021) on CEO departures of S&P 1500 firms between 2000 and 2018. The authors identify all kinds of CEO departures and classify all voluntary and involuntary departures into eight different categories. Using similar categories in Fee et al. (2013), I create a dummy variable E*xo_CEO_shock*[27], which takes one for three quarters following the announcement of the replacement decisions. I also control for any other CEO departures (*other_CEO_shock*) in my regressions.

Table 7 reports the results regarding the attention mechanism. The coefficient on the interaction of E*xo_CEO_shock* and *other_CEO_shock* is negative and significant both for future R&D investments and product similarity between firm-peers (Columns 1-2), suggesting that the learning effect is attenuated by exogenous CEO departures due to decreased attention to rival disclosures. These results suggest that firm attention plays a role in the extent to how firms learn from rival disclosures, which is not explored in the disclosure literature.

Second, I use the financial crisis of 2008 as an economy-wide shock to firm attention. In a survey study, Campello et al. (2010) show that firms, even unconstrained firms, cut spending on technology, employment, etc., and stay irresponsive to attractive investment opportunities during the financial crisis. I argue that the financial crisis arguably caused firms to focus on other issues, such as liquidity management or reorganization, rather than seeking new investment opportunities.

To test whether an economy-wide attention shock affect firm learning from redacted disclosures, first, I manually collect data on confidential material agreements[28] before the crisis since CT Orders are only available after May 2008 on the SEC EDGAR website. I create a dummy variable *Post_fincrisis* which takes a value of one for seven quarters between the 3rd quarter of 2008 and the first quarter of 2010 to measure the effect of the financial crisis. I restrict my sample to three years around the crisis, i.e., from the third quarter of 2005 to the 3rd quarter

[27] Particularly, I use following four categories as *exogenous* types of departures: Category 1: Involuntary—CEO death, Category 2: Involuntary—CEO illness, Category 4: Involuntary—CEO dismissed for personal issues, and Category 5: Voluntary—CEO retired. Other categories (endogenous departures) include; Category 3: Involuntary—CEO dismissed for job performance, Category 6: Voluntary—New Opportunity, Category 7: Other, and Category 8: missed. See Gentry et al. (2021) for details.

[28] I collect data on confidential material agreements starting from 2005 by only searching 10-K and 10-Q files for convenience due to additional effort for manual collection. I first identify all material agreement before 2008 and search the text of these agreements for 'confidential treatment' and its variations to further determine whether the material agreement in question is redacted or not.

of 2011. For a possible concern that post-crisis investment behavior might drive the effect in future R&D spending and product market decisions that might correlate with peer disclosures, I also control the interaction of *Post_fincrisis#R&D* in my regressions.

The results in Table 7 (Columns 3-4) show that the interaction effect of a temporary financial crisis shock and confidential dummy is negative and significant for predicting future R&D investment and product similarity between the firm and its peers. The results suggest that an economy-wide shock that averts firm attention to matters other than future investment opportunities reduces the effect of firm learning, confirming the moderating effect of firm attention on peer learning. However, the results regarding the financial crisis should be treated with caution since the crisis may affect firm investment behavior in dimensions other than firm attention that I failed to control, and that may correlate with peer redaction choice.

5. Discussion and Conclusion

In this study, I examine whether firms can extract valuable information from their peers' redacted disclosures for their subsequent investment decisions. I find that competitors change their investment behavior upon observing such disclosures, suggesting a learning effect. Next, I show that there is greater information demand for redacted disclosures, suggesting an increase in attention to these filings. Finally, using CEO departures and the financial crisis as an exogenous shock to firm attention, I show that firm attention might be a potential underlying mechanism that can explain the learning effects documented in the literature. The results shown in this paper are robust to various static and time-varying confounding factors that may explain the observed association.

Despite my efforts to document a causal relation between redacted disclosures and peer investment behavior, several caveats are worth mentioning. First, one of the challenges in studying the relations in peer settings is the reflection problem, as explained in previous sections. A possible scenario that might explain the observed association is that peers simply respond to the same growth opportunity shock. I attempt to overcome this problem by using highly granular fixed effects to control such shocks. However, since there is a time difference between an observed redacted filing and rivals' future investments, I still may fail to control confounding effects that might explain the observed association. Second, the information leakage may not necessarily originate from a redacted contract but from other information sources regarding the

same underlying activity concealed in redacted contracts. For instance, rivals may gather information through common suppliers or other information networks instead of redacted filings. Unfortunately, it is challenging to disentangle those effects without knowing the actual information flow between rivals. However, it is still more likely that firms first observe redacting filings that may increase the awareness of such opportunities and only then use other information sources to extract more information.

Another caveat relates to the attention mechanism I attempt to document in my study. Although descriptive analyses show that redactions receive significantly more downloads, pinpointing the underlying reason is still challenging since the choice of redaction is endogenous to the firm- and filing-specific characteristics. Despite my attempts to control those factors in my regression analyses, it is still possible that these filings are downloaded more, not because of the unconditional greater attention but because they simply have different characteristics than unredacted material agreements. This concern is partly mitigated in my analyses since greater attention to redacted contracts seems independent from the contract type. One alternative solution might be to collect additional information regarding the type of unredacted contracts that make it possible to compare redacted and non-redacted filings of the same type. However, even in this case, the underlying redactions are not observable, whether they relate to just one word, a number, or an entire paragraph that makes these contracts potentially different. Furthermore, even if the underlying information can be observed, the importance or, in other words, the true proprietary nature of the information concealed is private information and unknown to researchers. Nevertheless, whether it is due to greater attention or the characteristics of these filings, this still does not alter my main inferences that rivals respond to redacting filings.

Finally, observing the results, one might naturally ask why firms redact in the first place if they anticipate that rivals can increase their attention to these filings and subsequently learn from them. The results in the paper suggest that redacting firms, on average, fail to protect proprietary information by censoring them. However, this does not necessarily mean that these redactions do not work for some subset of firms. On the contrary, redacting firms may find it best to increase the acquisition cost for rivals by putting a barrier with redactions while inadvertently decreasing rivals' awareness costs. The average effect seems to result from the interplay between these two opposing forces.

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Appendix – A

Description of Variables

Dependent variables	
$\Delta Similarity_{ij,t+T}$	the change in product similarity ($similarity_{i,j,t+T} - similarity_{i,j,t}$) between firm *i* and peer *j*.
$R\&D\ investment_{i,q+1}$	One quarter ahead R&D intensity calculated as $xrdq_{q+1}/at_q$
$R\&D\ investment_{i,y+1}$	Subsequent four-quarter R&D intensity calculated as: $\frac{\sum_{i=1}^{4}(xrdq_{q+i})}{at_q}$
Treatment Variables	
$confidential\ dummy_{ijt}$	An indicator variable that takes the value of one if the firm *i* observes at least one confidential exhibit by its peer *j* in a given quarter
log $(confidential)_{ijt}$	The number of confidential exhibits filed by peer *j* of firm *i* in the current quarter
$License - R\&D\ dummy_{ijt}$	An indicator variable that takes the value of one if the confidential exhibit is of type licensing or R&D related
$Supply\ dummy_{ijt}$	An indicator variable that takes the value of one if the confidential exhibit is a supply agreement
$Financing\ dummy_{ijt}$	An indicator variable that takes the value of one if the confidential exhibit is a credit agreement
$Employ\ dummy_{ijt}$	An indicator variable that takes the value of one if the confidential exhibit is an employment related agreement
$Invest\ dummy_{ijt}$	An indicator variable that takes the value of one if the confidential exhibit is an investment agreement
$Peer\ dummy_{ijt}$	An indicator variable that takes the value of one if the confidential exhibit is a joint agreement
$Other\ confidential\ dummy_{ijt}$	An indicator variable that takes the value of one if the confidential exhibit is of another type
Control Variables	
$SizeQ_{i(j)t}$	The natural logarithm of the quarterly market value of equity: $cshoq\ x\ prccq$
$similarity_{i,j,t}$	The product market similarity between firm *i* and peer *j* in a given year as in TNIC3 industry by Hoberg & Philips (2016)
$R\&DQ_{i(j)t}$	R&D intensity calculated as $xrdq_q/at_q$ where $xrdq_q$ is set to zero if missing
$missing\ R\&DQ_{i(j)t}$	An indicator variable that takes the value one if $xrdq_q$ is missing
$MBQ_{i(j)t}$	Market-to-book value calculated as $(cshoq\ x\ prccq)/ceqq$
$LeverageQ_{i(j)t}$	The sum of long-term and short-term debt scaled by total assets $(dlttq + dlcq)/at$ where missing variables in nominator is set to zero.
$ROAQ_{i(j)t}$	The earnings before extraordinary items scaled by total assets: ibq/at_q
$LOSSQ_{i(j)t}$	An indicator variable that takes the value of one if the firm (peer) reports a loss ($niq < 0$)
log $(main\ filing)$	The natural logarithm of the number of downloads of the main filing (i.e.,10-K or 10-Q) to which a material exhibit is attached;.

Additional Variables	
$Exo\_CEO\_departures_{ijt}$	An indicator variable that takes the value one for three quarters following peer *j* of firm *i* experiences an exogenous CEO turnover
$Other\_CEO\_departures_{ijt}$	An indicator variable that takes the value one for three quarters following peer *j* of firm *i* experiences other types of CEO turnover
log $(other\ material\ exhibits)_{ijt}$	The number of non-confidential material exhibits filed by peer *j* of firm *i* in the current quarter
$Post_{ijt}$	An indicator variable for the financial crisis that takes the value one for the quarters between 2008Q3 and 2010Q1
ROA_OPY_{jt}	Operating profitability before R&D and depreciation scaled by total assets for the year $(oiadp\ +\ dp\ +\ xrd)/at$
$Market\ Fluidity_{jt}$	The product market fluidity measure by Hoberg et al., (2014) capturing the rival movements towards firm in product space.
$Innovation_{jt}$	Textual innovation measure by Ahci & Joos (2019)

Appendix – B.1

Confidential Treatment Order

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
September 13, 2017

ORDER GRANTING CONFIDENTIAL TREATMENT
UNDER THE SECURITIES EXCHANGE ACT OF 1934

Tesla, Inc. Filer name

File No. 1-34756 - CF#35364

Tesla, Inc. submitted an application under Rule 24b-2 requesting confidential treatment for information it excluded from the Exhibits to a Form 10-Q filed on August 4, 2017.

Form type Filing date

Based on representations by Tesla, Inc. that this information qualifies as confidential commercial or financial information under the Freedom of Information Act, 5 U.S.C. 552(b)(4), the Division of Corporation Finance has determined not to publicly disclose it. Accordingly, excluded information from the following exhibit(s) will not be released to the public for the time period(s) specified:

Redacted Exhibits	Exhibit 10.4 Exhibit 10.5 Exhibit 10.7 Exhibit 10.8	through December 31, 2019 through December 31, 2019 through December 31, 2019 through December 31, 2019

Expiration dates

For the Commission, by the Division of Corporation Finance, pursuant to delegated authority:

Brent J. Fields
Secretary

Appendix B.2

Confidential Treatment Order (Extension and several filings)

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
April 23, 2015

ORDER GRANTING CONFIDENTIAL TREATMENT
THE SECURITIES EXCHANGE ACT OF 1934

Ligand Pharmaceuticals Incorporated

File No. 1-33093 - CF#32050

Ligand Pharmaceuticals Incorporated submitted an application under Rule 24b-2 requesting an extension of prior grants of confidential treatment for information it excluded from the Exhibits to Forms 10-K filed on March 3, 2011 and February 23, 2012.

Based on representations by Ligand Pharmaceuticals Incorporated that this information qualifies as confidential commercial or financial information under the Freedom of Information Act, 5 U.S.C. 552(b)(4), the Division of Corporation Finance has determined not to publicly disclose it. Accordingly, excluded information from the following exhibits will not be released to the public for the time periods specified:

Exhibit	to Form	Filed on	Confidential Treatment Granted
10.114	10-K	March 3, 2011	through March 5, 2018
10.131	10-K	February 23, 2012	through February 23, 2018
10.132	10-K	February 23, 2012	through February 23, 2018
10.133	10-K	February 23, 2012	through February 23, 2018

For the Commission, by the Division of Corporation Finance, pursuant to delegated authority:

Brent J. Fields
Secretary

Appendix C – Excerpt from a confidential filing (redacted exhibit)

Exhibit 10.15 of 10-K filed on 2019-03-18 by Arcturus Therapeutics Ltd.

*(*Highlights are my own)*

EX-10.15 4 arct-ex1015_582.htm EX-10.15

Exhibit 10.15

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission.
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4) and Rule 24b-2

RESEARCH COLLABORATION AGREEMENT

THIS RESEARCH COLLABORATION AGREEMENT is entered into and effective as of March 8, 2019 (the ***"Effective Date"***), by and between **ARCTURUS THERAPEUTICS, INC.** (***"Arcturus"***), a Delaware corporation, having offices at 10628 Science Center Drive, Suite 250, San Diego, CA 92121 and **MILLENNIUM PHARMACEUTICALS, INC.** (***"Takeda"***), a wholly owned subsidiary of Takeda Pharmaceutical Company Limited and a Delaware corporation organized under the laws of Delaware, having offices at 40 Landsdowne Street, Cambridge, MA 02139, collectively the ***"Parties"*** and respectively the "***Party***".

WHEREAS, Arcturus (i) owns a proprietary lipid nanoparticle technology referred to as LUNAR technology (the ***"LUNAR Technology"***) which is useful in delivering therapeutic nucleic acid molecules to various cells in vivo, including hepatocytes, (ii) possesses expertise in producing lipid nanoparticle formulated therapeutic nucleic acid molecules, including mRNA, and (iii) has developed proprietary protein modification expertise, mRNA designs and processes to produce therapeutic mRNA molecules [...***...][1] and any data pertaining thereto), (the "***Arcturus mRNA Technology"***).

WHEREAS, Takeda possesses expertise in the pre-clinical and clinical development of therapeutic compounds to treat various conditions, including non-alcoholic steatohepatitis (NASH).

WHEREAS, the Parties have completed the Research Program to discover siRNA medicines under the Research Agreement executed by the Parties as of December 6, 2016, as amended (the "***2016 Research Agreement***") with US $[...***...][2] of the research funding which was paid by Takeda to Arcturus and remains unspent or uncommitted by Arcturus at the time of completion (the ***"Remaining Funds"***).

WHEREAS, notwithstanding Section 3.2 of the 2016 Research Agreement providing Arcturus' obligation to reimburse the Remaining Funds to Takeda, the Parties desire to collaboratively conduct the research set forth in **Exhibit A** hereto (the ***"Research Plan"***), by using the Remaining Funds for the purpose of generating, producing and/or optimizing therapeutic mRNA molecules [...***...] [3] (collectively, the ***"Materials"***) for their evaluation in [...***...] [4] (the ***"Studies"***) to inform the Parties as to whether or not to further develop the Materials for the treatment of [...***...] [5].

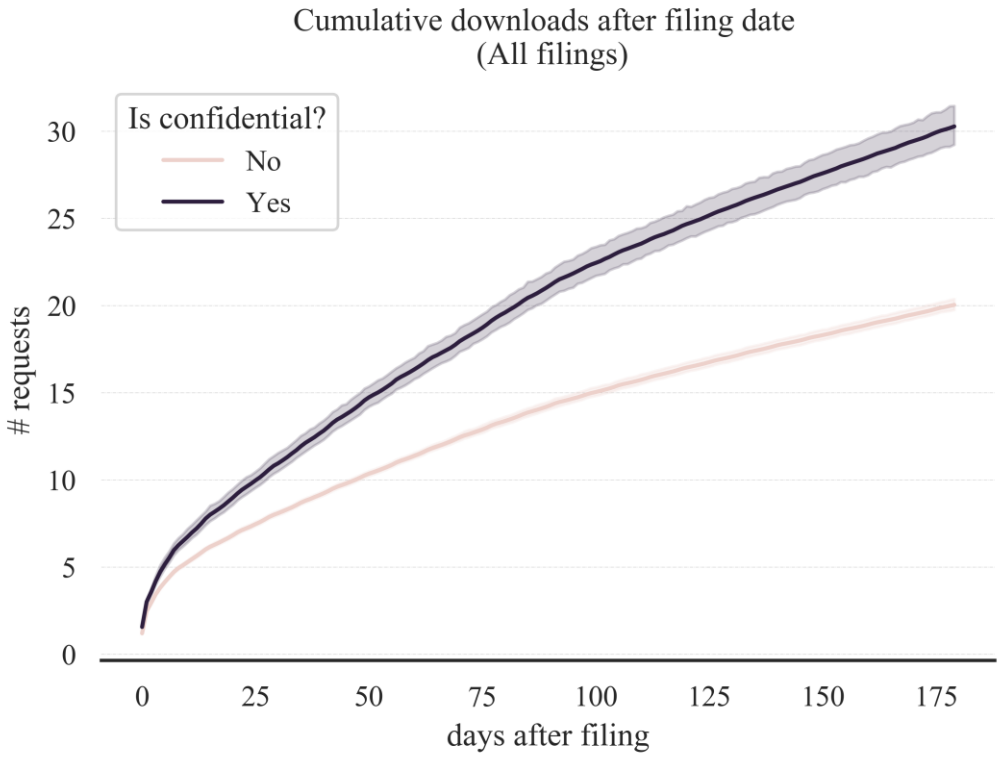

Figure 1 - Number of downloads of material agreements

The figure plots the cumulative number of requests/downloads of material exhibits (EX-10.XXs) up until 6 months after their filing and compares the downloads of confidential to non-confidential exhibits. Material exhibits in this figure are filed with either 10-Qs or 10-Ks between 2008 and 2017 due to availability of EDGAR log files. Confidential material exhibits are identified from confidential treatment orders made public by the SEC after May 1, 2008.

Table 1 - Sample Construction

Panel A: Selection of Confidential Treatment Orders

Description	**# of CT Orders**
Total downloaded CT Orders filed between 2008 and 2018	12,664
After dropping CTOs with extensions or denial	11,255
After dropping CT Orders for filings other than 10-K, 10-Q, and 8-K	9,625

Panel B: Selection of redacted firms and filings

Description	**# filings**	**# exhibits**
Number of filings and exhibits in 9,625 CT Orders	9,729	16,397
After dropping number of unidentified filings and exhibits	8,549	14,712
After dropping firms according to sample selection criteria (dropping firms not in CRSP/Compustat and/or TNIC3 industry data; dropping financials and utility firms and firms with missing variables)	6,724	11,503

Panel C: Disclosing Peers by year

Year	# sample peers	# redacting peers	# redacted filing	# redacted exhibit
2008	3,807	488	698	1,162
2009	3,617	452	658	1,200
2010	3,449	477	686	1,177
2011	3,336	440	646	1,075
2012	3,225	413	585	950
2013	3,232	391	580	966
2014	3,403	409	580	966
2015	3,438	407	578	982
2016	3,281	366	551	990
2017	3,184	372	552	990
2018	3,230	413	610	1,045
TOTAL	**37,202**	**4,628**	**6,724**	**11,503**

Table 2 - Future Investment Behavior of Firms

	$RDQ_{i,q+1}$	$RDY_{i,y+1}$	$\Delta Similarity_{ij,t+1}$		$\Delta Similarity_{ij,t+2}$		$\Delta Similarity_{ij,t+3}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Confidential dummy	**0.0002*** **	**0.0004** **	**0.0002*** **	**0.0001*** **	**0.0005*** **	**0.0004*** **	**0.0003*** **	**0.0002*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Similarity score	0.0237***	-0.0178***	-0.1367***	-0.5904***	-0.2131***	-0.8505***	-0.2554***	-0.9256***
	(0.001)	(0.003)	(0.001)	(0.003)	(0.002)	(0.004)	(0.004)	(0.004)
RDQ_{firm}	-0.0197***	1.1341***	-0.0015***	0.0062***	0.0012**	0.0097***	0.0008	0.0067***
	(0.001)	(0.005)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Missing $R\&DQ_{firm}$	0.0101***	0.0390***	-0.0000	-0.0002*	0.0001*	-0.0002	-0.0001	-0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$MBQ_{\_firm}$	0.0002***	0.0008***	0.0000*	-0.0000***	-0.0000***	-0.0000***	0.0000***	-0.0000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$LEVERAGEQ_{\_firm}$	-0.0064***	0.0343***	-0.0013***	-0.0003*	-0.0007***	-0.0007***	-0.0019***	-0.0019***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$ROAQ_{\_firm}$	-0.0067***	-0.1427***	-0.0005***	0.0012***	0.0007***	0.0019***	-0.0009***	-0.0009**
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$LOSSQ_{\_firm}$	0.0005***	-0.0083***	-0.0001***	-0.0002***	0.0001**	0.0000	0.0001*	-0.0005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Size_{firm}$	-0.0042***	-0.0315***	-0.0000	0.0006***	0.0001***	0.0011***	-0.0004***	0.0007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Size_{peer}$	-0.0002***	0.0085***	0.0004***	0.0006***	0.0006***	0.0010***	0.0001*	0.0007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$RDQ_{\_peer}$	0.0025***	0.0092***	0.0049***	0.0067***	0.0081***	0.0097***	0.0046***	0.0068***
	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Missing RDQ_{peer}	0.0004***	0.0009***	-0.0004***	-0.0004***	-0.0006***	-0.0004*	-0.0003	-0.0002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MBQ_{peer}	-0.0000**	-0.0000	0.0000**	-0.0000***	-0.0000*	-0.0000***	-0.0000	-0.0000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$LEVERAGEQ_{peer}$	0.0002	-0.0017**	-0.0010***	-0.0002	-0.0021***	-0.0006**	-0.0037***	-0.0019***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$ROAQ_{peer}$	0.0004	0.0045***	0.0015***	0.0016***	0.0016***	0.0020***	-0.0016***	-0.0007*
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$LOSSQ_{peer}$	-0.0001*	0.0000	-0.0000	0.0000	0.0001**	0.0001**	-0.0003***	-0.0004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm#Year FE	No	No	Yes	No	Yes	No	Yes	No
Firm#Peer FE	No	No	No	Yes	No	Yes	No	Yes
Firm#Peer#Year FE	Yes	Yes	No	No	No	No	No	No
Peer FE	No	No	Yes	No	Yes	No	Yes	No
Year#Quarter FE	No	No	No	Yes	No	Yes	No	Yes
#Observations	9,513,761	8,791,287	7,197,977	7,197,977	5,052,505	5,052,505	3,498,230	3,498,230
Adj. R^2	0.86	0.93	0.24	0.43	0.34	0.62	0.40	0.70

The Table reports the results of future investment behavior of firms in response to redacting peers. The dependent variables for future investments are one-quarter and one-year (four subsequent quarters) ahead R&D intensity and the change in similarity between firm and peers for the next three years relative to current year. See Appendix A for the description of variables. See Appendix A for the description of variables. *, **, *** show the significance levels at 10%, 5%, 1%, respectively. The standard errors are shown in parantheses and clustered at the firm-peer level.

Table 3 - Redacting Peer Analyses

	$ROAOPY_t$	$ROAOPY_{t+1}$	$ROAOPY_t$	$ROAOPY_{t+1}$	$ROAOPY_{t+1}$	$Fluidity_t$	$Fluidity_{t+1}$	$Log(Innovation)_t$	$Log(Innovation)_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Confidential dummy	0.0066**	0.0009				0.0476	0.0820**		
	(0.003)	(0.004)				(0.039)	(0.039)		
License - R&D			0.0148**	0.0155*	0.0761**			0.0135	0.0321**
			(0.006)	(0.008)	(0.035)			(0.016)	(0.014)
License - R&D # log(Fluididity)					-0.0254*				
					(0.015)				
Supply			-0.0064	-0.0108*	-0.0106				
			(0.004)	(0.005)	(0.005)				
Financing			-0.0059	-0.0026	-0.0024				
			(0.004)	(0.006)	(0.006)				
Employment			0.0066	0.0016	0.0005				
			(0.011)	(0.014)	(0.014)				
Investment			-0.0058	0.0050	0.0047				
			(0.008)	(0.010)	(0.010)				
Peer			0.0089	0.0027	0.0054				
			(0.007)	(0.011)	(0.011)				
Service			-0.0141	-0.0087	-0.0088				
			(0.011)	(0.018)	(0.018)				
#Observations	30,851	28,305	30,851	28,305	28,305	30,891	28,328	28,603	24,120
Adj. R^2	0.76	0.72	0.84	0.72	0.72	0.86	0.84	0.77	0.79
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The Table reports the effect of confidential filings on the redacting firm itself. See Appendix A for the description of variables. *, **, *** show the significance levels at 10%, 5%, 1%, respectively. The standard errors are shown in parantheses and clustered at the firm-peer level.

Table 4 - Robustness Tests

	$\Delta Similarity_{ij,t+1}$	$\Delta Similarity_{ij,t+1}$	$\Delta Similarity_{ij,t+1}$	$\Delta Similarity_{ij,t+1}$
	(Alternative)	(no customer-supplier)	(no joint agreements)	(decomposition)
	(1)	(2)	(3)	(4)
Confidential dummy		**0.0001*** **	**0.0001*** **	
		(0.000)	**(0.000)**	
Log(confidential)$_{peer}$	**0.0001*** **			
	(0.000)			
Log(other exhibits) $_{peer}$	0.0000			
	(0.000)			
License - R&D				0.0004***
				(0.000)
Supply				-0.0000
				(0.000)
Financing				0.0005***
				(0.000)
Employment				0.0009***
				(0.000)
Investment				-0.0003*
				(0.000)
Peer				-0.0005***
				(0.000)
Service				-0.0004*
				(0.000)
Others				-0.0005***
				(0.000)
Controls Firm	Yes	Yes	Yes	Yes
Controls Peer	Yes	Yes	Yes	Yes
Firm#Peer FE	Yes	Yes	Yes	Yes
Year#Quarter FE	Yes	Yes	Yes	Yes
#Observations	7,197,977	7,176,044	7,042,226	7,197,977
Adj. R^2	0.43	0.43	0.43	0.43

The Table reports the robustness test results with alternative treatment variable, removing specific contracts from the sample and the decomposition of contract types. See Appendix A for the description of variables. *, **, *** show the significance levels at 10%, 5%, 1%, respectively. The standard errors are shown in parantheses and clustered at the firm-peer level.

Table 5 - Additional Analyses and Moderating Effects

	$RDQ_{i,q+1}$	$RDY_{i,y+1}$	$\Delta Similarity_{ij,t+1}$	$\Delta Similarity_{ij,t+1}$	$\Delta Similarity_{ij,t+1}$	$\Delta Similarity_{ij,t+1}$
	(1)	(2)	(3)	(4)	(5)	6)
Confidential dummy	0.0011***	0.0031***	0.0004***	0.0004***	0.0001***	0.0001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Confidential # Size$_{firm}$	-0.0002***	-0.0005***				
	(0.000)	(0.000)				
Confidential # Strong rival			-0.0005***			
			(0.000)			
Confidential # TotalSimilarity$_{peer}$				-0.0000***		
				(0.000)		
Confidential dummy # ΔRDQ$_{peer}$					0.0030***	
					(0.001)	
Confidential # same_state						-0.0001
						(0.000)
Strong rival			0.0001			
			(0.000)			
TotalSimilarity$_{peer}$				0.0001***		
				(0.000)		
ΔRDQ$_{peer}$					0.0006***	
					(0.000)	
same_state=1						0.0005**
						(0.000)
#Observations	9,513,761	8,791,287	7,197,977	7,197,977	7,197,977	7,197,977
Adj. R^2	0.86	0.93	0.43	0.43	0.43	0.43
Firm & Peer controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm#Peer FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Q FE	Yes	Yes	Yes	Yes	Yes	Yes

The Table reports the moderating effects of size, relationship between firm-peers and current market structure of redacting peers. See Appendix A for the description of variables. *, **, *** show the significance levels at 10%, 5%, 1%, respectively. The standard errors are shown in parantheses and clustered at the firm-peer level.

Table 6 - Information Demand for Confidential Filings

	All material exhibits (Exhibits 10.XX)						Main filings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Confidential dummy	*0.455****	*0.517****	*0.430****	*0.429****				
	(0.03)	*(0.02)*	*(0.02)*	*(0.02)*				
Log(main filing)	0.095***	-0.033***	-0.117***		-0.033***			
	(0.01)	(0.01)	(0.03)		(0.01)			
License-RD dummy					0.544***	0.445***		
					(0.04)	(0.04)		
Supply dummy					0.080*	0.091*		
					(0.04)	(0.04)		
Financing dummy					0.668***	0.514***		
					(0.04)	(0.05)		
Employment dummy					0.098*	0.161*		
					(0.04)	(0.07)		
Investment dummy					0.510***	0.374***		
					(0.05)	(0.07)		
Peer dummy					0.416***	0.393***		
					(0.04)	(0.06)		
Service&Consult					0.075	0.095		
					(0.08)	(0.11)		
Other					0.433***	0.344***		
					(0.03)	(0.02)		
Confidential filing							-0.117***	-0.019
							(0.03)	(0.02)
Constant	3.155***	3.995***	4.540***	3.766***	3.996***	3.767***	6.626***	6.624***
	(0.10)	(0.06)	(0.18)	(0.00)	(0.06)	(0.00)	(0.01)	(0.00)
# Observations	144,438	144,438	144,438	144,438	144,438	144,438	51,173	51,173
Adj. R^2	0.04	0.46	0.63	0.60	0.46	0.60	0.00	0.47
Firm FE	No	Yes	No	Yes	Yes	Yes	No	Yes
Year#Quarter FE	No	Yes	No	Yes	Yes	Yes	No	No
Firm#YearQ FE	No	No	Yes	No	No	No	No	No
Form Type FE	No	Yes	Yes	No	Yes	No	No	No
Filing FE	No	No	No	Yes	No	Yes	No	No

The Table shows the downloads of confidential exhibits (columns 1-6) and the main filings to which confidential exhibits are attached (columns 7-8) compared to their non-confidential exhibits (filings). See Appendix A for the description of variables. *, **, *** show the significance levels at 10%, 5%, 1%, respectively. The standard errors are shown in parantheses and clustered at the firm level.

Table 7 - Attention Mechanism Tests

	$\Delta Similarity_{ij,t+2}$	$RDY_{t+1,\ firm}$	$\Delta Similarity_{ij,t+2}$	$RDY_{t+1,\ firm}$
	(1)	(2)	(3)	(4)
Confidential dummy	0.0004***	0.0004***	0.0002***	0.0006**
	(0.000)	(0.000)	(0.000)	(0.000)
Confidential # Exo_CEO_shock	-0.0018***	-0.0024**		
	(0.000)	(0.001)		
Confidential # Post_fincrisis			-0.0003***	-0.0044***
			(0.000)	(0.000)
Exo_CEO_shock	-0.0011***	-0.0037***		
	(0.000)	(0.000)		
Other_CEO_shock	0.0005**	-0.0014***		
	(0.000)	(0.000)		
Post_fincrisis # $RDQ_{q+1,\ firm}$			0.0075***	-0.0210***
			(0.001)	(0.005)
#Observations	4,272,576	4,272,576	2,790,512	4,416,351
Adj. R^2	0.61	0.89	0.63	0.90
Firm and Peer Controls	Yes	Yes	Yes	Yes
Firm#Peer FE	Yes	No	Yes	No
Year_quarter FE	Yes	No	Yes	No
Firm-peer#year	No	Yes	No	Yes

The Table reports the results for attention mechanism tests using two quasi-natural experiments, namely exogenous CEO departures of firms and 2008 financial crisis. See Appendix A for the description of variables. *, **, *** show the significance levels at 10%, 5%, 1%, respectively. The standard errors are shown in parantheses and clustered at the firm-peer level.