When you talk, I remain silent: Spillover effects of peers' mandatory disclosures on firms' voluntary disclosures

Matthias Breuer[*]
Columbia University

Katharina Hombach[†]
Frankfurt School of Finance and Management

Maximilian A. Müller[‡]
WHU – Otto Beisheim School of Management

This Draft: April 2019

Abstract

We predict and find that regulated firms' mandatory disclosures crowd out unregulated firms' voluntary disclosures. Consistent with information spillovers from regulated to unregulated firms, we document that unregulated firms reduce their own disclosures in the presence of regulated firms' disclosures. We further find that unregulated firms reduce their disclosures more the greater the strength of the regulatory information spillovers. Our findings suggest that a substitutive relationship between regulated and unregulated firms' disclosures attenuates the effect of disclosure regulation on the market-wide information environment.

JEL classifications: M41, G38
Keywords: Mandatory disclosure; Voluntary disclosure; Information spillovers; Crowding-out

Acknowledgements: We thank Tobias Berg, Phil Berger, Jannis Bischof, Pietro Bonetti, Ulf Brüggemann, Willem Bujink, Hans Christensen, Joachim Gassen, Igor Goncharov, Ole-Kristian Hope, Martin Jacob, Laurence van Lent, Christian Leuz, Garen Markarian, Mike Minnis, Steven Monahan, Maximilian Muhn, Peter Pope, Nemit Shroff, Harm Schütt, Thorsten Sellhorn, Jeroen Suijs, Rodrigo Verdi, Robert E. Verrecchia, and seminar participants at Tilburg University, the University of Iowa, the University of Mannheim, the University of Göttingen, Stockholm School of Economics, the WHU – Otto Beisheim School of Management, the Frankfurt School of Finance and Management, the EAA Doctoral Colloquium 2014, the AFAANZ Doctoral Symposium 2014, and the 2017 FARS Midyear Meeting for helpful comments and suggestions on an earlier version of this paper. Breuer gratefully acknowledges the financial support of the Accounting Research Center at the University of Chicago Booth School of Business and the Doctoral Fellowship of the Deloitte Foundation. Müller gratefully acknowledges financial support by the German Academic Exchange Service (DAAD).

[*] mb4468@gsb.columbia.edu; Columbia University, Graduate School of Business, 3022 Broadway, New York, NY 10027, United States of America.
[†] k.hombach@fs.de; Frankfurt School of Finance and Management, Adickesallee 32-34, 60322 Frankfurt, Germany.
[‡] maximilian.mueller@whu.edu; WHU – Otto Beisheim School of Management, Chair of Financial Reporting, Burgplatz 2, 56179 Vallendar, Germany.

1. Introduction

Disclosure regulation is frequently motivated by the desire to strengthen the market-wide information environment (e.g., Coffee 1984; Easterbrook and Fischel 1984; Dye 1990; Fox 1999; Leuz and Wysocki 2016). To be economical, the regulation often only applies to a specific segment of the market (e.g., public firms). This selective regulation creates a gap between regulated and unregulated firms (e.g., public vs. private firms; Zingales 2009). An unintended consequence of this regulation can be that regulated firms' public disclosures crowd out other market participants' information production (e.g., Goldstein and Yang 2017). In particular, Admati and Pfleiderer (2000) predict that regulated firms' public disclosures crowd out *unregulated* firms' public disclosures. This crowding-out would mute the regulatory effect on the market-wide information environment. Moreover, it would widen the gap between regulated and unregulated firms more than presumably intended by the regulator, exacerbating the cost of operating in regulated segments (De Fontenay 2017).

To explore the effect of regulated firms' disclosures on unregulated firms' disclosures, we use the setting of German limited-liability firms. These firms are subject to a size-based disclosure regulation prescribing differential minimum amounts (or precision) of disclosures. Under this regulation, firms are classified as "small" ("medium") if they fall beneath (exceed) any two of three regulatory thresholds related to firm size (total assets: approximately €5 million; sales: approximately €10 million; employees: 50) for two consecutive years. "Small" firms need only disclose an unaudited and highly condensed balance sheet including short notes. By contrast, "medium" firms must disclose an audited and more granular balance sheet, an income statement, extended notes, and a management report. As a result of these discontinuous disclosure requirements, "small" firms around the regulatory thresholds face low disclosure requirements relative to their size and disclosure incentives, whereas "medium" firms around the same thresholds face high disclosure requirements relative to their size and disclosure incentives. Thus, we consider "small" firms around the small-medium thresholds as

effectively unregulated and "medium" firms around the small-medium thresholds as effectively regulated.

Following Admati and Pfleiderer (2000), we predict that unregulated "small" firms reduce their disclosures in the presence of regulated "medium" firms' disclosures due to information spillovers. If "medium" firms' disclosures are useful for evaluating "small" firms, "small" firms can reduce their own disclosures, free-riding on the benefits conferred by "medium" firms' disclosures and economizing on their own disclosure costs (e.g., Admati and Pfleiderer 2000; Baginski and Hinson 2016). Ideally, we would test our prediction by comparing "small" firms' disclosures across two regimes: (1) a mandatory regime, with increased disclosure requirements applying to "medium" firms, and (2) a voluntary regime, without increased disclosure requirements applying to "medium" firms. While we observe "small" firms' disclosures in the mandatory regime, we do not observe their counterfactual disclosures in the voluntary regime—absent heightened disclosure requirements for "medium" firms.

To approximate firms' disclosures in a voluntary regime, we use a set of benchmark firms which effectively disclose in a voluntary regime. These benchmark firms are large private firms with firm sizes far exceeding the small-medium thresholds. We consider their disclosures as unaffected by their own and "medium" firms' disclosure requirements. For one, the largest firms have the greatest voluntary disclosure incentives, likely exceeding their own minimum disclosure requirements. For another, they are unlikely to benefit much from and free-ride on (comparably small) "medium" firms' disclosures. From these large firms, we derive a size-adjusted benchmark for disclosures in a voluntary regime. Specifically, we scale large firms' disclosures (measured as the characters in firms' filings) by the number of clicks received for their filings on the official publication platform (similar to SEC EDGAR in the United States). We refer to this benchmark as the "disclosure/click multiple." Our benchmark firms have an average disclosure/click multiple of 365; that is, they disclose 365 characters

for each click received on their filings. As clicks approximate the number of stakeholders consuming firms' financial statements, the benchmark multiple essentially captures how much a firm discloses per stakeholder in the voluntary regime.

Using this benchmark multiple, we predict firms' disclosures in the voluntary regime. To that end, we assume that, in a voluntary regime, firms would provide the same disclosures *per stakeholder* as our benchmark firms. By using the number of clicks to predict firms' disclosures in the voluntary regime, we explicitly take firms' size-related incentives for public disclosure into account. The key assumption underlying this approach is that firms' disclosures in a voluntary regime, on average, increase at an approximately constant rate with the number of their stakeholders (as captured by clicks).

In empirical tests, we compare firms' disclosure/click multiples in the mandatory regime to our benchmark multiple for the voluntary regime. We refer to the difference between firms' observed disclosure/click multiple and our benchmark multiple as "abnormal disclosures" (per stakeholder). We specifically focus on abnormal disclosures by unregulated "small" and regulated "medium" firms around the regulatory thresholds, where we observe stark differences in disclosure requirements for otherwise similar firms.

We document that "medium" firms around the threshold exhibit positive abnormal disclosures: they provide around 65 percent more disclosures per stakeholder than predicted in a voluntary regime (amounting to an increase of about 2.8 pages of information). This finding is consistent with a direct effect of the regulation on "medium" firms' disclosures. By contrast, we find that "small" firms around the regulatory thresholds exhibit negative abnormal disclosures. These firms provide 35 percent fewer disclosures per stakeholder than predicted in a voluntary regime (amounting to a decrease of about 1.2 pages of information). This finding suggests an indirect effect

of "medium" firms' increased disclosure requirements on "small" firms' disclosures due to information spillovers. In particular, the reduced disclosures by "small" firms are consistent with these firms exhibiting lower net benefits of disclosure per stakeholder in the presence of heightened disclosure requirements applying to their "medium" peers.

To corroborate that the reduced disclosures of "small" firms are due to information spillovers from "medium" firms, we provide cross-sectional evidence that the crowding-out varies with the strength of the information spillover (Admati and Pfleiderer 2000). We expect information spillovers to be stronger when firms' fundamentals are more highly correlated, when there are more regulated firms in the same peer group, and when the direct effect of the disclosure requirements on regulated firms is larger. To test these predictions, we compare the abnormal disclosures of otherwise similar "small" and "medium" firms around the regulatory thresholds across different peer groups. Consistent with our predictions, we find that the disclosure gap between "small" and "medium" firms is larger in industries with greater asset comovement, in local industry peer groups with more "medium" firms, and in local industry peer groups in which "medium" peers provide more disclosures in the mandatory regime.[1]

Our cross-sectional results allay the concern that our finding of a spillover effect for "small" firms are unduly driven by a flawed disclosure/click benchmark (as this benchmark is differenced out in the cross-sectional specifications). Moreover, we document that the widening of the disclosure gap between "small" and "medium" firms holds using alternative disclosure proxies, namely firms' disclosure in the mandatory regime, disclosure timeliness, and voluntary disclosure of sales information. Unlike firms' abnormal disclosures, these alternative proxies are explicitly not based on

[1] Our peer group definition at the local industry level is based on studies showing that firms share information commonalities when operating in the same industry and region (Engelberg et al. 2018; Ma 2017). For our small and medium-sized sample firms, the main input and output markets are likely local. Hence, information about economic conditions of suppliers and competitors in these local markets should provide the greatest information spillovers.

our disclosure/click benchmark. Collectively, our cross-sectional results are consistent with information spillovers from "medium" firms' disclosures crowding out "small" firms' disclosures.

In supplemental tests, we assess the plausibility of our key identifying assumption and validate the necessary conditions underlying our empirical approach. In support of our identifying assumption, we, for example, find that firms' disclosures in a voluntary regime—a period of low enforcement—indeed follow the pattern predicted by stakeholders' clicks. In support of our necessary conditions, we, for example, document that "medium" firms are substantially more regulated than "small" firms, and that the largest firms appear to provide de facto voluntary disclosures. In placebo tests, we further fail to identify crowding-out in two alternative settings where all firms are either effectively unregulated or regulated. These tests suggest that our main findings are plausibly due to regulated "medium" firms' disclosures crowding out effectively unregulated "small" firms' disclosures.

Our paper contributes to the literature on financial-disclosure regulation (for a review, see Leuz and Wysocki 2016) by stressing that the effect of mandatory disclosure on the market-wide information environment is muted by crowding-out effects. Crowding-out effects feature prominently in theoretical work on firms' disclosure in the presence of endogenous information acquisition and information production by other market participants (e.g., Admati and Pfleiderer 2000; Kurlat and Veldkamp 2015; Goldstein and Yang 2017). This line of work highlights that, as a result of crowding-out, disclosure regulation can ambiguously affect the market-wide information environment and the efficiency of resource allocation. Recent empirical work by Breuer, Hombach, and Müller (2018) and Breuer (2018) likewise provides evidence consistent with disclosure regulation deterring banks' private information acquisition and firms' proprietary information generation. Extending this nascent literature, our paper provides direct evidence on a further channel through which the effect of disclosure regulation on the market-wide information is muted: regulated firms' disclosures crowd out unregulated firms' disclosures.

Our paper echoes recent evidence on crowding-out and displacement effects of regulation in the economics literature (e.g., Crépon, Duflo, Gurgand, Rathelot, and Zamora 2013; Rotemberg 2017; Duguay, Minnis, and Sutherland 2018). With respect to disclosure regulation, recent work by De Fontenay (2017) suggests that the bifurcated system in the United States (regulating public but not private firms) has contributed to the declining attractiveness of U.S. public capital markets (e.g., Gao, Ritter, and Zhu 2013; Dambra, Field, and Gustafson 2015; Doidge, Karolyi, and Stulz 2017). Consistent with this argument, Breuer (2018) documents that firms enter public capital markets at lower rates if more firms in a given product market are exempted from disclosure regulation. Our paper suggests that disclosure regulation benefits unregulated firms through information spillovers from regulated firms (e.g., Badertscher, Shroff, and White 2013), while imposing costs (e.g., proprietary costs) on regulated firms. As both types of firms compete in the same product markets (e.g., Bens, Berger, and Monahan 2011), differential disclosure regulation may contribute to the displacement of regulated firms by unregulated ones, rather than improving aggregate outcomes.

2. Institutional background

The EU disclosure regulation for limited-liability firms as implemented in Germany provides a unique setting to examine regulatory crowding-out. The regulation requires distinct minimum levels of disclosure for three firm-size groups ("small", "medium", and "large"). "Small" firms must disclose an unaudited, highly aggregated balance sheet with brief notes only. By contrast, "medium" firms must provide audited financial statements including a disaggregated balance sheet, an income statement, extended notes, and a management discussion. "Large" firms must additionally disclose a number of further line items and notes. Across all groups, firms must publicly disclose their financial statements via a central depository, the Federal Gazette (akin to SEC EDGAR in the United States). Table A.1 in the online appendix provides a summary of the specific disclosure requirements.

In our empirical tests, we focus on the stark differences in disclosure requirements applying to "small" and "medium" firms. Specifically, we investigate whether the disclosures by more extensively regulated "medium" firms have spillover effects on the disclosures of less regulated "small" firms. Firms are classified into either group based on three size criteria. Firms are classified as "medium" if they exceed any two out of three firm size thresholds—related to total assets (€4.84 million), sales (€9.68 million), and employees (50)—for two consecutive years. "Small" and "medium" firms clustered just above and below these thresholds are similar along all dimensions except their minimum disclosure requirements (Breuer et al. 2018).

3. Prior literature & hypothesis development

3.1. Spillovers of public disclosure

Firms' financial disclosures can provide information relevant for peer firms (e.g., Foster 1980; Foster 1981; Savor and Wilson 2016). For example, Durnev and Mangen (2009), Beatty, Liao, and Yu (2013), and Badertscher et al. (2013) document firms' financial disclosures are used by peers in deciding on their investments. In addition, Garmaise and Natividad (2016), Shroff, Verdi, and Yost (2017), and Berger, Minnis, and Sutherland (2017) show capital providers incorporate firms' financial disclosures in pricing and financing peer firms. By lowering capital providers' uncertainty about the type of peer firms, firms' financial disclosures reduce the demand for peer firms' own disclosures. Consistent with reduced demand for peer firms' own disclosures arising from a substitutive relationship between own and peer firms' disclosures, Baginski and Hinson (2016) show that firms start providing voluntary management forecasts if their peers cease to provide such forecasts. We contribute to this literature by documenting spillover effects arising from a disclosure regulation affecting some, but not all firms.

3.2. Public disclosure of private firms

In contrast to the US, private firms' financial reporting is regulated in the EU. Therefore, public disclosure requirements, if strictly enforced, importantly shape European private firms' public disclosure (e.g., Minnis and Shroff 2017; Bernard 2016; Breuer et al. 2018). Besides regulatory forces, private firms' public disclosure is affected by economic forces. Survey evidence in Arrunada (2011), Kitching, Kašperová, and Collis (2015), Minnis and Shroff (2017), and Gassen and Muhn (2018) suggests that private firms use public disclosure to reduce adverse selection concerns of existing and, in particular, prospective customers, suppliers, and creditors. In line with the survey evidence, Breuer et al. (2018), for example, document that private firms' public disclosures are useful for prospective creditors. Competitive and privacy concerns, by contrast, dissuade private firms from public disclosure (e.g., Minnis and Shroff 2017; Gassen and Muhn 2018). Dedman and Lennox (2009) and Bernard (2016), for example, find that private firms reduce their public disclosures if they perceive competitive disadvantages from revealing financial information to their competitors.

The relative importance of economic vis-à-vis regulatory forces in shaping private firms' public disclosure tends to vary with firm size. Larger private firms more frequently rely on *public* (rather than private) disclosure in communicating with their numerous stakeholders than smaller ones do (e.g., Dedman and Lennox 2009). A given minimum disclosure requirement, accordingly, tends to primarily force smaller rather than larger firms to extend their public disclosure (e.g., Bernard 2016). This pattern motivates the size-based disclosure requirements in our setting and plays an important role in our research design.

3.3. Hypotheses

Absent disclosure regulation, a firm decides on its own disclosure by weighing benefits such as reduced adverse selection discounts against costs such as proprietary information loss (e.g., Jung and Kwon 1988; Verrecchia 1983, 1990; Admati and Pfleiderer 2000). In its disclosure decision, the

firm—explicitly or implicitly—takes peer firms' disclosure decisions into account if peers' disclosures provide correlated information relevant for the firm and its stakeholders (e.g., Dye 1990; Admati and Pfleiderer 2000).

Disclosures of financial statements provide correlated information allowing for direct and specific cross-firm learning (e.g., Foster 1981). In the presence of these information spillovers, disclosures by peers reduce stakeholders' uncertainty about the firm and hence the firm's marginal benefit of own disclosure. At the same time, the firm's own disclosure is useful to peers and their stakeholders increasing the firm's proprietary costs and hurting its competitive position. Thus, own and peer firm disclosures are substitutes in the presence of information spillovers.

Figure 1 presents the substitutive relationship between own and peer firm disclosures for the case of two correlated firms—one regulated and one not—in two scenarios—a voluntary and the mandatory regime—following the disclosure game of Admati and Pfleiderer (2000). In the voluntary regime, both firms take each other's disclosure into account leading to an equilibrium in which neither firm would prefer to increase or decrease its disclosure.

In the mandatory regime, the disclosure mandate pushes the regulated firm's disclosure above its disclosure in a voluntary regime. This allows the unregulated firm to reduce its disclosure below its level in a voluntary regime for two reasons. First, the greater disclosure by peers reduces stakeholders' uncertainty about the firm and, hence, the firm's benefit of own disclosure. Second, the regulated peer firm cannot react to the unregulated firm's reduction of own disclosure because the regulated firm's best response function is constrained from below. The result is an equilibrium in which the unregulated firm can reduce its own disclosure and proprietary cost without suffering from an increase in its stakeholders' uncertainty. Stakeholders' uncertainty does not increase because the regulated firm cannot respond by reducing its disclosure when the unregulated firm reduces disclosure.

Based on this disclosure game, we predict that, if there are information spillovers from regulated firms, unregulated firms reduce their disclosure in the mandatory regime below what they would have provided in a voluntary regime. In our setting, we expect the substitutive relationship to primarily emerge because of information spillovers within information intermediaries such as banks and corporate credit bureaus catering to several customers and suppliers (e.g., the Creditreform in Germany). These intermediaries obtain information about multiple firms, allowing them to learn about unregulated firms from observing regulated ones in the same region and industry. Garmaise and Natividad (2015), for example, document that banks are more likely to lend to opaque firms if banks possess information about local peer firms. Accordingly, the opaque firms can free-ride on their peers' information, reducing the value of their own information.

In contrast to our prediction of a substitutive disclosure relation due to information spillovers, alternative theories focusing on competitive spillovers (e.g., competition for attention) would suggest a complementary disclosure relation. Regulated firms' increased disclosures could, for example, shift market participants' attention toward the regulated firms. In this case, unregulated firms would increase their own disclosures to counteract the loss of market participants' interest (e.g., Ross 1977; Grossman and Hart 1980; Grossman 1981; Merton 1987; Fishman and Hagerty 1989; Lin, Mao, and Wang 2018). Absent any spillovers, regulated firms' public disclosures will not affect unregulated firms' disclosures.

4. Research design

4.1. Challenge & approach

A suitable experiment to identify spillover effects of disclosure regulation features three groups of firms (Angelucci and Maro 2015; Baird, Bohren, McIntosh, and Özler 2014): those that are directly affected by the regulation (group 1); those that are indirectly affected due to information spillovers (group 2); and those that are unaffected—directly and indirectly—by the regulation (group 3). The

difference between indirectly affected and unaffected firms (groups 2 and 3) captures the spillover effect of interest to our study. In our empirical strategy, we draw upon unique institutional details and theory to identify groups of directly affected, indirectly affected, and unaffected firms. Specifically, we consider "medium" firms to be directly affected (group 1), "small" firms to be indirectly affected (group 2), and very large firms to be unaffected (group 3) by the increased disclosure requirements applying to "medium" firms. We summarize the correspondence between our theoretical concepts and their empirical implementation in Table 1. In section 7.2, we provide empirical evidence supporting the patterns described below in our setting.

Figure 2 illustrates our research design graphically. Panel A of Figure 2 plots the disclosure of firms across firm sizes in a counterfactual regime without differential disclosure requirements ("voluntary regime").[2] Consistent with ample empirical evidence and economic theory, we draw voluntary disclosure as an increasing function of firm size.

The disclosure regulation has a direct effect on "medium" firms (group 1) around the small-medium threshold. The extensive minimum requirements applying to "medium" firms push their disclosures in the mandatory regime above their disclosures in the voluntary regime (Panel B of Figure 2). By contrast, "small" firms (group 2) around the small-medium threshold are similar to "medium" ones in terms of size and disclosure incentives, but face only low minimum disclosure requirements. Accordingly, we expect that "small" firms around the small-medium thresholds, on average, choose to disclose more in a voluntary regime than their minimum requirements. These firms are the largest firms categorized as "small" by the reporting regulation and are among the largest 10 percent of all limited-liability firms (Figure A.2 in the online appendix). They can be expected to exhibit non-

[2] We are interested in the spillover effects resulting from heightened disclosure requirements applying to "medium" firms. The relevant counterfactual is a regime without these differential requirements, not a regime without any minimum requirements.

negligible public disclosure incentives because public disclosure allows them to reach all their stakeholders at once, rather than incurring the costs of communicating with each stakeholder individually.

In the presence of information spillovers, "small" firms will be indirectly affected by the disclosure requirements applying to "medium" firms. Thus, we expect these "small" firms to provide fewer disclosures in the mandatory regime than in the counterfactual voluntary regime (Panel C of Figure 2). Finally, we expect very large firms' disclosures to be unaffected by their own minimum disclosure requirements as well as by information spillovers from comparably small "medium" firms' disclosures in the mandatory regime (Panel D of Figure 2). Accordingly, the largest firms' observed disclosures in a mandatory regime ($Q_3^{Mandatory}$) correspond to their disclosures in a voluntary regime, which we denote as: $Q_3^{Mandatory} = Q_3^{Voluntary}$.[3]

This correspondence allows us to estimate the relationship between firm size and firms' disclosure in a voluntary regime. Specifically, we derive a slope coefficient, or multiple ($\beta = Q_3^{Voluntary} / N_3$) relating firms' disclosures in a voluntary regime to firm size (N). Under the identifying assumption that firms' disclosures in a voluntary regime increase, on average, at an approximately constant rate with size, we can use the largest firms' multiple observed in the mandatory regime to infer the disclosure of other firms in a voluntary regime. Firm *i*'s *predicted* disclosures in a voluntary regime would then be given by $\hat{Q}_i^{Voluntary} = \left(Q_3^{Voluntary} / N_3\right) N_i = \beta N_i$.

This approach allows us to compare firms' disclosure observed in the mandatory regime with their own disclosures predicted for the voluntary regime. The difference in these disclosures is due to

[3] We provide empirical evidence consistent with the largest firms being unaffected by their own and others' minimum disclosure requirements in Section 7.2.

the increased minimum requirements applying to "medium" firms. We label it "abnormal disclosure" ($Q_i^{Mandatory} - \hat{Q}_i^{Voluntary}$).

4.2. Empirical implementation

In our empirical tests, we construct the benchmark multiple β (the relation between firms' disclosure in a voluntary regime and their size) using the largest firms' disclosures divided by the number of clicks for firms' filing on the official publication platform ("disclosure/click multiple"). The idea is that the number of clicks captures the number of stakeholders interested in firms' disclosures, which is a major determinant of stakeholders' disclosure demand and hence firms' disclosure incentives (Breuer, Hombach, and Müller 2017). In our sample, the empirical disclosure/click multiple of the largest firms is 365 because these firms disclose, on average, about 19,000 characters ($Q_3^{Voluntary}$) and receive about 52 clicks (N_3). Accordingly, for a "small" or "medium" firm *i* with eight clicks ($N_i = 8$), for example, we predict a disclosure of 2,920 characters in a voluntary regime ($\hat{Q}_i^{Voluntary} = \beta N_i = 365 \times 8$).

In our main test, we compare firms' disclosures around the small-medium threshold as illustrated in Panel E of Figure 2. If there is a direct effect of the disclosure regulation on "medium" firms' disclosures, we expect their disclosures in the mandatory regime to exceed their disclosures in the voluntary regime (positive abnormal disclosures). If there is an indirect effect of the disclosure regulation on "small" firms' disclosures due to information spillovers, we expect their disclosures in the mandatory regime to fall short of their disclosures in the voluntary regime (negative abnormal disclosures).

The main test estimates the average impact of *any* positive abnormal disclosures of "medium" firms on the disclosures of "small" firms of a given size. It relies on the identifying assumption that

the disclosures/click multiple of the largest firms provides an accurate benchmark for our "small" firms' disclosures absent spillovers from "medium" firms' disclosures. By using the largest firms' multiple as a benchmark for "small" firms' disclosures in a voluntary regime, we essentially assume that firms, on average, provide the same amount of incremental disclosure for each additional click.

One concern might be that not all clicks capture "beneficial" disclosure demand. Some clicks, for example, can stem from nosy neighbors or competitors causing privacy or proprietary costs. Such "costly" clicks, however, do not invalidate our use of the disclosure/click multiple to predict firms' disclosure per stakeholder in a voluntary regime, so long as the relative contribution of beneficial and costly clicks to all clicks does not significantly differ across firm sizes. If anything, we expect the relative contribution of "costly" clicks to increase with firm size: additional clicks may disproportionally stem from the interested public rather than suppliers or creditors. This would imply that the largest firms' disclosures/click multiple underestimates "small" firms' disclosure incentives in a voluntary regime, biasing against finding support for greater disclosures in a voluntary than the mandatory regime. We provide an analytical example for this argument in Section A of the online appendix and empirical evidence supporting the plausibility of our identifying assumption in Section 7.1.

In our second set of tests, we explore whether the disclosure gap between "small" and "medium" firms varies with the expected strength of the information spillovers. We focus on variation in the disclosure gap between "small" and "medium" firms, rather than variation in "small" firms' disclosures, to account for confounding peer-group characteristics (e.g., differences in disclosure practices or economic factors across industries and regions). Taking confounding peer-group characteristics into account is important because the expected strength of spillover effects is not randomly assigned to peer groups. Thus, firms in peer groups with stronger spillover effects may

differ from firms in peer groups with weaker spillover effects. Focusing on the gap between "small" and "medium" firms' disclosures allows us to account for such confounding differences.

In this vein, we estimate the following specification resembling a difference-in-differences design (first difference: "small" vs. "medium"; second difference: high vs. low spillovers):

$$Log(Q_{i,t}^{Mandatory}) - Log(Q_{i,t}^{Voluntary}) = \delta_1 Small_{i,t} + \delta_2 Small_{i,t} \times Spillover_{c,j,t} + \alpha_{c,j,t} + \phi f_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where i, t, c, and j denote the firm, year, county, and industry classification, respectively. Our dependent variable, $Log(Q_{i,t}^{Mandatory}) - Log(Q_{i,t}^{Voluntary})$, is a firm's abnormal disclosure in a given year (defined as the difference between the logarithms of its mandatory and voluntarily disclosure). $Small_{i,t}$ is an indicator variable taking the value of one for firms classified as "small," and zero for firms classified as "medium" in a given year. $Spillover_{c,j,t}$ is a proxy for the expected strength of information spillovers within a peer group. $a_{c,j,t}$ represents the fixed effect for a given county-industry-year combination. $f_{i,t}$ is a control function including (log) firm sizes (total assets, sales, and employees) centered at the small-medium threshold and (log) firm age to focus on otherwise similar "small" and "medium" firms around the thresholds.[4]

δ_1 captures the difference between otherwise similar "small" and "medium" firms' abnormal disclosures for firms with limited or no information spillovers. δ_2, our coefficient of interest, captures the incremental impact of the expected strength of the spillover effect in a given county, industry, and year on the difference between otherwise similar "small" and "medium" firms' abnormal disclosures. If there are information spillovers due to the greater disclosure requirements applying to "medium" firms, we expect "small" firms around the small-medium threshold to reduce their abnormal

[4] We allow the coefficients on the size dimensions to differ above and below the respective size-based thresholds. For more details on this approach, see also Breuer et al. (2018: 1275-77).

disclosures more (compared to their "medium" peers) when information spillovers are stronger. Hence, we expect δ_2 to be negative.

Our main and cross-sectional tests exhibit distinct benefits. The key benefit of our main test is that we compare "small" and "medium" firms' disclosures observed in the mandatory regime with their *own* disclosures predicted for the voluntary regime. This feature allows us to separately identify the direct and indirect effect of the "medium" firm disclosure requirements on "medium" and "small" firms around the small-medium threshold. By contrast, in our cross-sectional tests, we investigate the total (direct plus indirect) effect of the "medium" firm disclosure requirements by comparing (abnormal) disclosures of "small" firms with those of "medium" firms.[5]

The key benefit of our cross-sectional approach is that it relaxes the reliance on the disclosure/click benchmark. As both, "small" and "medium" firms' abnormal disclosures are determined relative to the largest firms' disclosures-per-click benchmark, taking the difference between "small" and "medium" firms' abnormal disclosures cancels the benchmark out. Hence, unlike in our main test, we do not rely on the assumption that the benchmark multiple derived from the largest firms is necessarily correct in the cross-sectional tests. By interacting the total regulatory effect with proxies of the strength of the spillover effect, our cross-sectional tests aim at identifying variation in the total effect of the "medium" disclosure requirements due to the indirect effect arising from "medium" firms' spillovers. This approach comes with the drawback that we need to explicitly pre-specify a peer group. By defining "small" firms' peers as "medium" firms within the same industry, county, and year, we assume that these within-county-industry "medium" firms are, on average, more strongly correlated with "small" firms than firms in other industries or counties would

[5] For an illustration of the direct, indirect, and total effect of the "medium" firm disclosure requirements, refer to Panel E of Figure 2.

be. Although we expect this assumption to hold on average, we note that this choice neglects other spillovers not originating from within-county-industry firms.

5. Data

We obtain data about German private firms' regulatory size class ("small", "medium", or "large") and disclosure outcomes (e.g., number of characters in a filing) for fiscal year-ends from 2006 to 2011, and stakeholders' disclosure demand (aggregated clicks) for filings published between December 2010 and February 2013 (corresponding to fiscal year-ends 2008 to 2011) from the Federal Gazette. For our cross-sectional tests, we enrich this data with financial data about our sample firms from Bureau van Dijk's *dafne* database. A full list of our variables, their definitions, and corresponding sources is provided in the variable appendix.

6. Results

6.1. Descriptive statistics

Table 2 provides descriptive statistics for our main variables by regulatory size class ("small", "medium", and "large"). As expected, there are large differences across the three groups. Firms' average disclosures in the mandatory regime and their average clicks strongly increase from "small" to "medium" and, in turn, from "medium" to "large" firms. The stark increase across size classes is consistent with increasing reporting requirements. It, however, may also reflect larger firms exhibiting greater disclosure incentives, due to a broader stakeholder base, as captured by their number of clicks. In our empirical tests, we explicitly account for these size-related differences in firms' disclosure incentives by focusing on firms' abnormal disclosures, defined as the difference between their observed disclosures and their disclosures predicted for the voluntary regime.

For the average "medium" firm, we observe positive abnormal disclosures, consistent with the regulation pushing these firms' disclosures in the mandatory regime above their disclosures level predicted for the voluntary regime. For the average "small" firm, we also observe positive abnormal

disclosures. This result is consistent with muted disclosure incentives for the *average* small private firm documented in prior literature, but inconsistent with our prediction of a spillover effect: if "small" firms receive positive information spillovers from their "medium" peers, we would expect them to reduce their disclosures and, hence, exhibit negative abnormal disclosures.

Notably, our prediction of a spillover effect on firms' disclosures does not relate to the *average* "small" firm, but to the largest "small" firms around the small-medium thresholds. As shown in Table 2, our sample firms extend over a broad firm-size range, even within the group of firms in the "small" regulatory size class. Many firms in this size class are very small and, hence, likely to exhibit only low public disclosure incentives, as reflected by their low number of clicks. Accordingly, even the low minimum requirements for "small" firms exceed the disclosure amounts these firms would choose voluntarily, as reflected by positive abnormal disclosures. In our empirical tests, we explicitly focus on comparably large "small" firms around the small-medium thresholds instead of the average "small" firm.

Figure 3 reinforces the need to take firm-size related disclosure incentives into account. It compares firms' disclosures (measured by the number of characters) observed for the mandatory regime and predicted for the voluntary regime, respectively, as a function of firm size, measured by total assets. In the left tail of the firm-size distribution, we observe that most "small" firms' disclosures in the mandatory regime exceed their disclosures predicted for the voluntary regime, consistent with the, on average, positive abnormal disclosures in Panel A of Table 2.[6] Yet, as "small" firms' size increases, their predicted disclosures in a voluntary regime likewise increase. For firms with total assets exceeding about €1.2 million (corresponding to a logarithm of about 14 on the x-axis in Figure 3), disclosures predicted for the voluntary regime start exceeding the disclosures observed in the

[6] This finding is consistent with prior evidence that the vast majority of the smallest firms, in a prior period with low enforcement, decided to withhold their financial statements (e.g., Bernard 2016; Breuer et al. 2017).

mandatory regime. For these firms closer to the small-medium threshold (the dashed vertical line in Figure 3), we expect to observe variation in disclosures due to information spillovers (explored in more detail in the next subsection).

In the right tail of the firm-size distribution, observed disclosures in the mandatory regime are generally undistinguishable from predicted disclosures in the voluntary regime for a wide range of firm sizes among the larger firms. In part, this pattern emerges by construction because we use larger firms' disclosure patterns as the benchmark for disclosures in a voluntary regime. We essentially calibrate predicted disclosures in a voluntary regime to the observed disclosures in the mandatory regime for larger firms with total assets of about €66 million, corresponding to a logarithm of 18 on the x-axis in Figure 3.[7] Yet, observed and predicted disclosures continue to overlap even for large firms of substantially smaller size than our benchmark firms. The overlap approximately extends to firm sizes of about €15 million total assets, corresponding to a logarithm of 16.5 on the x-axis in Figure 3. This pattern supports the validity of our disclosure/click multiple: for firms presumably unaffected by regulatory information spillovers, predicted and observed disclosures overlap, implying that the disclosure/click multiple does not appear to strongly vary with firm size.

6.2. Spillover effects

Around the small-medium (total-assets) threshold, Figure 3 provides evidence on the existence of spillover effects by comparing firms' disclosures observed in the mandatory regime with their disclosures predicted for the voluntary regime.[8] Disclosures in the mandatory regime significantly deviate from disclosures in the voluntary regime around the small-medium threshold. In particular, firms just above (to the right of) the threshold—predominantly "medium" firms—exhibit on average

[7] Our inferences remain unchanged when we choose a lower calibration point of around €24 million, corresponding to a logarithm of 17 on the x-axis in Figure 3.
[8] Specifically, we compare local averages calculated using a smoothed kernel estimator.

slightly greater disclosures in the mandatory than in the voluntary regime. By contrast, firms just below (to the left of) the threshold—predominantly "small" firms—exhibit on average lower disclosures in the mandatory than in the voluntary regime. These patterns are confirmed in a graph of abnormal disclosures (Panel A of Figure 4) and disclosure/click multiples (Panel B of Figure 4) across firm sizes, consistent with crowding-out due to information spillovers.[9]

To strengthen the identification of a direct effect of the regulation on "medium" firms and an indirect spillover effect on "small" firms, we zoom into the area right around the small-medium discontinuity. To determine firms' effective distance to the regulatory discontinuity, we construct a distance measure ("Least Distance to Threshold") which accounts for the multivariate (total assets-, sales-, and employees-based) assignment rule of the regulation (Breuer et al. 2018). Figure 5 plots abnormal disclosures for "small" firms to the left of the combined threshold and for "medium" firms to the right of the combined threshold. At the combined threshold, the "medium" firms exhibit abnormal disclosures of about 9,000 characters, suggesting that the disclosure mandate indeed pushes their disclosures in the mandatory regime above what these would have been in the voluntary regime. By contrast, similarly sized "small" firms at the combined threshold exhibit abnormal disclosures of about -2,000 characters, suggesting that they reduce their disclosures in the mandatory regime, relative to what they would have provided in the voluntary regime. Using multivariate regressions to account for all three regulatory size dimensions and firm age, we find very similar results. "Medium" firms exhibit positive abnormal disclosures of about 8,440 characters (amounting to 2.8 pages or 65 percent of their disclosures in a voluntary regime), whereas "small" firms exhibit negative abnormal disclosures of about 3,580 characters (amounting to 1.2 pages or 35 percent of their disclosures in a voluntary

[9] In our sample, firms are assigned to the regulated group (i.e., classified as "medium") when they exceed two out of three size criteria over two years. Accordingly, there is some overlap of regulated and unregulated firms with similar total assets, and the local averages depicted in our figure compose observations from both regulated and unregulated firms. With average firm size increasing above the total asset threshold, the share of regulated firms increases.

regime) (Table 3). Consistent with our prediction, these patterns suggest that firms reduce their own disclosures when other firms are forced to increase theirs.

Notably, the documented patterns are unlikely to be unduly confounded by selection of firms around the small-medium threshold ("selection effect"). The literature documents that firms with low net benefits of additional disclosures (e.g., those with high proprietary costs) try to avoid size-based disclosure requirements by manipulating their size (e.g., Gao, Wu, and Zimmerman 2009; Bernard, Burgstahler, and Kaya 2018). Hence, firms just beneath the threshold could exhibit low disclosure levels due to sorting based on, for example, proprietary cost of disclosure, rather than spillover effects. Although this concern is valid, two pieces of evidence refute that the selection effect primarily accounts for our results.

First, we document that "small" firms over an extended range (from €1.2 million up to the small-medium threshold at €4.84 million of total assets) before the small-medium threshold provide less disclosures than expected in a voluntary regime. It is unlikely that this pattern can be explained by local selection behavior around the threshold documented by prior literature focusing on firms near the threshold. Second, Breuer et al. (2018, Table 3) document that "small" and "medium" firms just around the threshold do not exhibit substantial covariate imbalances after accounting for the three regulatory size dimensions (total assets, sales, and employees). This suggests that selection—even right around the threshold—should not be a major concern.

6.3. Cross-sectional variation in strength of information spillovers

The preceding analysis suggests that "small" firms reduce their disclosures in the mandatory regime compared to the voluntary regime, whereas the increased disclosure requirements push "medium" firms above their disclosure levels of the voluntary regime. As a result, there is a gap

between "small" and "medium" firms' abnormal disclosures. If this gap is due to information spillovers, we expect it to widen when information spillovers are stronger.

To test this prediction, we exploit variation across different peer groups in terms of the expected strength of the spillover effect. We define peer groups at the local industry level. This definition is based on prior literature documenting information commonalities among firms operating in local industry clusters (Engelberg et al. 2018; Ma 2017) and takes into account that our private sample firms likely compete in local product and labor markets. We expect information spillovers to be stronger when firms' fundamentals are more highly correlated, when there are more regulated peers, and when regulated peers provide greater abnormal disclosures. When fundamentals are more strongly correlated, stakeholders can learn more about unregulated firms by observing regulated firms. When there is a greater number of regulated peers and regulated peers provide greater abnormal disclosures, regulated peers contribute more to the information environment, allowing unregulated firms to economize on their own disclosure cost.

Figure 6 illustrates our cross-sectional approach. It plots firms' abnormal disclosures around the combined threshold separately for firms in peer groups with high versus low expected spillovers (as measured by peer firms' asset comovement).[10] Consistent with our prediction, we find that "small" firms' abnormal disclosures are more negative in industries with greater asset comovement. We, however, also observe that "medium" firms' disclosures differ across the peer groups with highs versus low asset comovement. This pattern hints at fundamental differences between the peer groups which

[10] To proxy for comovement in fundamentals, we obtain the R-squared from industry-specific regressions of firms' standardized asset growth on year-fixed effects, following Guiso and Parigi (1999) and Badertscher et al. (2013). This measure reflects how much of firms' variation in year-over-year asset growth can be explained by factors shared by all industry peers. This industry-specific R-Squared is, however, correlated with the number of firms operating in a given industry. In particular, industries with only few firms will exhibit a higher R-squared. To purge the variation in R-squared of variation in the number of peer firms (the role of which we investigate separately using our second proxy), we residualize our R-squared measure with respect to industry size (measured by the number of firms in a given industry). We define high comovement firms as those in the top quartile of the distribution of our R-squared measure.

may confound the comparison of "small" firms' disclosures across these groups. To account for such differences, we essentially use a difference-in-differences design. We compare the disclosure gap between "small" and "medium" firms within a given peer group (first differences) across peer groups with high versus low spillovers (second difference). This approach alleviates concerns that all ("small" and "medium") firms in local industries with high asset comovement may simply have low disclosure incentives due to a stronger reliance on relationship banking in these local industries, for example.

We report the results of our cross-sectional tests in Table 4. We find that the difference between "small" and "medium" firms' abnormal disclosures is larger in industries with a high comovement in asset growth, as indicated by the negative and significant coefficient on $Small_{i,t} \times High\_R2_j$ (Column 1 of Panel A). This finding supports the notion that firms and their stakeholders can learn more from peers' disclosures, and hence benefit less from firms' own disclosures, when firms' fundamentals are highly correlated (Admati and Pfleiderer 2000, p. 499). Similarly, we find that the abnormal disclosure gap between "small" and "medium" firms increases with (the natural logarithm of) the number of "medium" peers as reflected by the negative and significant coefficient on $Small_{i,t} \times \#\ of\ Medium\ Peers_{c,j,t}$ (Column 1 of Panel B). This finding is consistent with the idea that regulatory spillovers and associated free-rider concerns increase in the number of peers. Lastly, we find that the abnormal disclosure gap increases when "medium" peers provide, in total, greater abnormal disclosures (Column 2 of Panel B). This finding is consistent with "small" firms around the small-medium thresholds reducing their disclosures to a greater extent when the regulation forces their "medium" peers' to disclose more, enhancing the market-wide information environment (Shroff et al. 2017).[11]

[11] In Table A.4 in the online appendix, we report alternative specifications, showing that our inferences remain largely unchanged when we use different definitions of peer groups and peers' aggregated disclosure.

We find similar patterns in the gap between "small" and "medium" firms' (raw) disclosures observed in the mandatory regime. Compared to "medium" firms, "small" firms reduce their disclosures in the mandatory regime more when firms are highly correlated (Column 2 of Panel A), when they have more "medium" peers (Column 3 of Panel B), and when their "medium" peers provide, in total, greater abnormal disclosures (Column 4 of Panel B). These results suggest that the widening of the abnormal disclosure gap is not merely driven by higher disclosure demand (i.e., clicks) for "small" firms' disclosures (e.g., due to more peers), but rather due to "small" firms adjusting their actual disclosures downward when their "medium" peers disclose more information.

Finally, we document that "small" firms increase the disclosure gap measured in terms of two alternative voluntary disclosure proxies when spillovers from "medium" firms are stronger. In particular, we show that "small" firms—relative to otherwise similar "medium" firms—delay the publication of their disclosures (Litjens and Suijs 2014) and are less likely to make voluntary sales disclosures (Dedman and Lennox 2009) when firms are highly correlated (Columns 3–4 of Panel A) or when they operate in a richer information environment due to their "medium" peers (Columns 5–8 of Panel B). Notably, these alternative voluntary disclosure proxies—unlike the number of characters—are not directly affected by differential disclosure requirements between "small" and "medium" firms.[12]

Taken together, the cross-sectional patterns support the notion that "small" firms' negative abnormal disclosures are due to information spillovers from "medium" firms' disclosures. Notably,

[12] Table 4 also shows that, when there are no (or low) information spillovers, "small" firms publish their financial statements more quickly (negative coefficient on *Small* in Columns 5 and 6 of Panel B) and are more likely to make voluntary sales disclosures (positive coefficient on *Small* in Columns 7 and 8 of Panel B). These differences plausibly reflect direct effects of the different disclosure requirements. First, "medium" firms likely need longer to prepare and publish their more extensive and audited financial statements. Second, given that "medium" firms have to provide an income statement (with an option to disclose gross profit, rather than sales), providing sales information inevitably reveals their gross profit margin. Since this is a key metric of interest to competitors (Dedman and Lennox 2009), the incremental costs of sales disclosure (in addition to other income statement information) is likely higher for "medium" firms.

the cross-sectional patterns allay concerns that our main findings are due to both "small" and "medium" firms merely supplying the minimum disclosure levels prescribed in our setting ("mechanical effect"). Consistent with our main findings, such mechanical effect would result in lower disclosure levels for "small" than for "medium" firms. The mechanical effect, however, suggests that these differences are due to a direct effect of differential disclosure requirements rather than an indirect spillover effect. Inconsistent with the mechanical effect, but consistent with the spillover effect, the cross-sectional evidence documents that our main effect varies with proxies for the spillover strength and holds for alternative disclosure outcomes not directly affected by minimum disclosure requirements.

7. Supplemental results

7.1. Identifying assumption

The identifying assumption underlying our findings in Section 6.2 is that firms' disclosures in a voluntary regime increase, on average, at an approximately constant rate with firm size as measured by the number of clicks. This assumption allows us to use the largest firms' disclosure/click multiple observed in the mandatory regime as a size-invariant benchmark to predict the disclosure of other firms in a voluntary regime. If this assumption is violated, our disclosure/click benchmark and inferences about "small" firms' abnormal disclosures might be flawed.

Although we ultimately cannot test our identifying assumption, we provide two pieces of evidence supporting its plausibility. First, we compare the number of clicks (observed during our sample period) with the rate of firms' voluntary disclosure of financial statements (observed for a period of low enforcement pre-dating our sample period) along the firm-size distribution (Figure A.1 in the online appendix). We find that "small" firms around the small-medium threshold exhibit, if anything, slightly higher voluntary disclosure rates relative to their number of clicks compared to our large benchmark firms ("small" firms: 19 percent disclosure rate / 22 clicks = 0.84; large firms: 37

percent disclosure rate / 52 clicks = 0.71). Second, we estimate the correlation of firms' observed disclosures/click multiples with firm size (total assets). We again find that firms' observed disclosures/click multiples, if anything, appear to decrease with firm size (Table A.3). Collectively, these findings suggest that the use of a constant disclosure/click benchmark derived from the largest firms, if anything, understates "small" firms' disclosure incentives in the voluntary regime. Such understatement would work against finding negative abnormal disclosures for "small" firms.

7.2. Necessary conditions

Our research design relies on a number of necessary conditions. In this section, we discuss the four central conditions and test their empirical validity. Although we provide evidence in support of each of these conditions, we also stress that violations of our conditions would mostly work against finding evidence supporting our hypothesis.

NC 1: Around the small-medium thresholds, "medium" firms' disclosures are, on average, regulated; that is, "medium" firms' disclosure requirements exceed their disclosures in a voluntary regime.

If this condition were violated, "medium" firms' disclosures would not be constrained by their disclosure requirements, preventing "small" firms from free-riding on regulated firms' disclosures in the mandatory regime.[13]

Our graphical evidence discussed in Section 6.2 already suggests that "medium" firms around the small-medium thresholds appear to exhibit disclosures in a mandatory regime that exceed their disclosures in the voluntary regime (Figure 5). We provide further evidence on the constraining effect of the regulation on firms' disclosures by investigating disclosure changes observed for firms switching

[13] In this spirit, we investigate an alternative (placebo) setting in which all firms, not just the less regulated or unregulated ones, exhibit disclosure incentives exceeding the respective disclosure requirements in the mandatory regime: firms around the medium-large threshold (Section 7.3).

from the "small" to the "medium" regulatory size class. Column 1 of Table 5 documents that a switch from the "small" to the "medium" size class increases firms' disclosures by about 118 percent ($exp(0.781)-1 \approx 118\%$). This evidence strongly supports that "medium" firms' disclosures are pushed above their voluntary levels by their disclosure requirements.

NC 2: At least some "small" firms' disclosures are effectively unregulated; that is, these "small" firms' disclosures in a voluntary regime exceed their minimum disclosure requirements.

If this condition were violated, all "small" firms would merely provide the required minimum in the mandatory regime, preventing us from detecting incremental effects of "medium" firms' disclosures on "small" firms' disclosures in a mandatory regime.[14]

Although we cannot directly test this condition, we note that our main results support its validity. For one, Figure 5 documents that, conditional on our identifying assumption, "small' firms around the small-medium thresholds appear to exhibit disclosures in a voluntary regime that exceed their disclosures (and requirements) in the mandatory regime. For another, our cross-sectional results in Table 4 document that "small" firms' disclosures in the mandatory regime vary predictably with the strength of information spillovers. We would not observe such cross-sectional variation if all "small" firms were only providing the uniform minimum required disclosures (see also Section 7.3). In sum, our main results support the validity of our second necessary condition.

NC 3: The largest firms' disclosures are generally unconstrained by their minimum disclosure requirements and unaffected by spillovers from other ("medium") firms' disclosure requirements.

If this condition were violated, the largest firms' disclosures would not constitute de facto voluntary disclosures. If the largest firms' observed disclosures were pushed above their voluntary

[14] In this spirit, we investigate an alternative (placebo) setting in which all firms, not just the more regulated ones, exhibit disclosure incentives falling short of their respective disclosure requirements in the mandatory regime: firms around the micro-small threshold (Section 7.3).

levels through their own disclosure requirements, we would overstate "small" firms' disclosures in a voluntary regime. If, by contrast, the largest firms' observed disclosures were reduced through spillovers from other ("medium") firms' disclosure requirements, we would understate "small" firms' disclosures in a voluntary regime.

To provide evidence on whether the largest firms' disclosures are constrained by the regulation, we investigate disclosure changes observed for firms switching from the "medium" to the "large" regulatory class. Column 2 of Table 5 documents that this switch does not significantly increase and, in fact, slightly decreases firms' disclosures by an immaterial 1.5 percent. This evidence is consistent with the disclosures observed for the largest firms exceeding their minimum disclosure requirements as conjectured by our third necessary condition.[15]

NC 4: Firms' number of clicks is not substantially affected by firms' own or other firms' minimum disclosure requirements.

If this condition were violated, we could not use the observed number of clicks in the mandatory regime as a proxy for firms' disclosure incentives in a voluntary regime. A potential concern is that the number of clicks observed for "small" firms' disclosures in a mandatory regime could be reduced by informational spillovers from "medium" firms. Thus, we would underestimate "small" firms' disclosures in a voluntary regime by multiplying the disclosure/click multiple with a too low number of clicks. Similarly, we would overestimate "medium" firms' disclosures in a voluntary regime if the more extensive disclosure requirements applied to these firms would per se attract more

[15] The increase in disclosure requirements around the medium-large threshold is of modest magnitude (in particular compared to the stark increase in requirements around the small-medium threshold). If firms around the medium-large threshold only disclosed the mandatory minimum, we would nevertheless expect our test to capture an effect of the regulation in their disclosure outcomes. The unambiguous (positive) sign of the effect and its low variance should make it easily detectable in our tests even if the effect is of only modest magnitude.

clicks (e.g., by shifting stakeholders' attention). (Note that these patterns, if anything, would work against our findings.)

As described in Section 6.2, our main results show that the number of clicks smoothly increases in firm size, which does not support the idea that the clicks on disclosures of "small" firms around the thresholds are affected by "medium" firms' disclosures.[16] We further test for the influence of firms' own minimum disclosure requirements on the number of clicks by investigating changes in the number of clicks for firms switching from the "small" to the "medium" regulatory size class. Column 3 of Table 5 documents that the number of clicks even slightly decreases for firms switching into the "medium" mandate ($exp(0.029)-1 \approx 3\%$). Consistent with our fourth necessary condition, this evidence suggests that the number of clicks is generally unaffected by direct effects of minimum disclosure requirements.

Notably, however, this evidence does not suggest that "medium" firms' disclosures do not affect "small" firms' disclosure demand. It suggests that the number of interested stakeholders is unaffected. It does not imply that the net benefit per stakeholder (as measured by the disclosure/click multiple) remains unaffected. To the contrary, our main results documents that "medium" firms' disclosures reduce "small" firms' net benefit per stakeholder, as reflected in the characters provided per click.

7.3. Placebo tests

Our main analysis focuses on firms around the small-medium thresholds. We argue this is a feasible setting to examine our research question because of the stark difference in mandatory minimum requirements applying to "small" and "medium" firms. While this differential regulation

[16] Figure A.1 in the online appendix further supports the idea that the number of clicks is largely unaffected by informational spillovers. The figure shows that the smooth increase in the number of clicks along the firm-size dimension closely resembles voluntary disclosure rates observed during a low-enforcement period.

constrains "medium" firms' disclosures from below, "small" firms around the threshold are, on average, unconstrained in that their disclosures in a voluntary regime exceed the low minimum requirements (satisfying NC 1 and NC 2).

In this section, we provide placebo tests exploiting two alternative thresholds: the micro-small threshold and the medium-large threshold. Around these two thresholds, all firms are either constrained or unconstrained by the regulation. Accordingly, these thresholds fail to provide for a setting where some, but not all firms are forced to disclose more than they would in a voluntary regime. We neither expect to find nor find evidence that "regulated" firms' disclosures crowd out "unregulated" firms' disclosures in these placebo settings.

A constrained setting: the micro-small threshold

In 2012, after our main sample period, disclosure requirements were relaxed for so-called "micro" firms based on claims that disclosure costs exceed these very small firms' disclosure benefits (European Commission 2011). "Micro" firms can abridge the balance sheet, avoid preparing notes, and opt to restrict public access to their disclosures (Table A.1). Firms are classified as "micro" if they do not exceed any two out of the following three firm size thresholds for two consecutive years: total assets (€0.35 million), sales (€0.7 million), and employees (10).

The micro-small setting fails to provide unregulated firms with substantial leeway and interest to incorporate other firms' disclosure decisions into their own disclosure decisions. Our abnormal disclosure measure implies that most "micro" firms are pushed above their disclosures in a voluntary regime during our sample period (Panel A of Figure 7) and continue to exhibit disclosures in the mandatory regime exceeding their disclosures expected in a voluntary regime even after the introduction of the reduced disclosure requirements (Panel B of Figure 7). Thus, the micro-small setting lacks unregulated firms that can freely choose their disclosures.

In the absence of unregulated firms, we do not detect spillover effects of "small" firms' disclosures on "micro" firms' disclosures in the mandatory regime. In particular, our cross-sectional results in Table 5 do not replicate for "micro" and "small" firms around the micro-small threshold. We do not find that "micro" firms around the micro-small threshold reduce their disclosures more than comparable "small" firms when facing more "small" peers, when their "small" peers provide greater abnormal disclosures, and when they operate in industries with high asset comovement (Panel A of Table 6). Hence, we find that "micro" firms' disclosures do not vary with the expected strength of a spillover effect, consistent with these firms' disclosures being constrained by the minimum requirements.

An unconstrained setting: the medium-large threshold

The medium-large firm setting fails to provide regulated firms that are substantially constrained by their disclosure mandate. In particular, we document that "large" firms' disclosures in the mandatory regime are, on average, not constrained by their minimum disclosure requirements (Columns 2 and 4 of Table 5). Thus, the medium-large firm setting lacks regulated firms that provide disclosures in the mandatory regime in excess of their disclosures in a voluntary regime.

In the absence of regulated firms, we do not detect any spillover effects of "large" firms' disclosures on "medium" firms' disclosures in the mandatory regime. In particular, the cross-sectional estimates in Panel B of Table 6 suggest that the gap between "medium" and "large" firms' disclosures marginally increases in the number of "large" peers (inconsistent with a spillover effect) and does not vary with the expected strength of the spillover effect as proxied by our measure of high asset comovement in a given industry. These results are consistent with "large" firms being, on average, unconstrained by their disclosure requirements. Nonetheless, in certain counties and industries, some "large" firms could still be pushed above their voluntary disclosure levels by the regulation, leading to spillovers affecting "medium" firms' disclosures. Consistent with this idea, we find that "medium"

firms' do reduce their own disclosure if the "large" peers located in their particular county and industry are actually pushed above their voluntary disclosure levels (Columns 3 and 6). Hence, we find results similar to those in our original setting and consistent with our prediction of a spillover effect in settings where disclosure requirements actually constrain "large" firms.[17]

8. Conclusion

We document that mandating some firms' disclosures appears to reduce *other* firms' disclosures. This evidence of crowding-out provides empirical support for theoretical work on the impact of disclosure regulation on firms' disclosures (Admati and Pfleiderer 2000) and adds to recent empirical work on the interaction of firms' and information intermediaries' information production efforts (e.g., Balakrishnan, Billings, Kelly, and Ljungqvist 2014; Baginski and Hinson 2016; Breuer et al. 2018).

Our evidence has three immediate implications. First, forcing some firms in an industry to provide more disclosures does not one-for-one improve the industry-wide information environment because the unregulated firms respond by reducing their own disclosures. Second, unregulated firms' disclosures observed in a mandatory regime are not necessarily equivalent to their disclosures in a voluntary regime. This follows as unregulated firms' disclosures are indirectly affected by regulated firms' disclosures in a mandatory regime. Third, disclosure regulation taxes regulated firms and subsidizes unregulated peer firms, potentially distorting competitive positions and contributing to displacement effects.

[17] In untabulated results, we do not find any crowding out using total "large" firm disclosures instead of total "large" firm abnormal disclosures. These results reinforce the notion that "large" firms' disclosures, on average, are unconstrained and do not provide (regulatory) information spillovers due to the "large" firm disclosure requirements.

Variable Appendix

Variable Definitions		
Variable Name	Source	Definition
Dependent Variables		
Disclosure in Mandatory Regime	Federal Gazette	Number of characters in a filing, observed in the mandatory disclosure regime
Clicks	Federal Gazette	Number of online views of a filing during the twelve months after its publication
Disclosure in Voluntary Regime	Federal Gazette	Disclosure amount predicted for the a voluntary regime, calculated as number of clicks multiplied by a disclosure/click-multiple
Abnormal Disclosure	Federal Gazette	Difference between the number of characters observed in the mandatory and predicted for the voluntary regime
Publication Lag	Federal Gazette	Number of days between fiscal year-end and publication date
Voluntary Sales Disclosure	Federal Gazette, Bureau van Dijk	Indicator variable taking the value of 1 if the firm voluntarily provides sales information in a given year, 0 otherwise
Disclosure Classification Variables		
Micro	Federal Gazette	Indicator variable taking the value of 1 for firm-years in which a firm is classified by the Federal Gazette as "micro," 0 if it is classified as "small."
Small	Federal Gazette	Indicator variable taking the value of 1 for firm-years in which a firm is classified by the Federal Gazette as "small," 0 if it is classified as "medium."
Medium	Federal Gazette	Indicator variable taking the value of 1 for firm-years in which a firm is classified by the Federal Gazette as "medium," 0 if it is classified as "small" or "large" (depending on the specification).
Large	Federal Gazette	Indicator variable taking the value of 1 for firm-years in which a firm is classified by the Federal Gazette as "large," 0 if it is classified as "small."
Size-Related Control Variables		
Total Assets	Federal Gazette, Bureau van Dijk	Total assets
Sales	Federal Gazette, Bureau van Dijk	Sales
Employees	Federal Gazette, Bureau van Dijk	Number of employees
Age	Bureau van Dijk	Number of years between incorporation and fiscal year-end

Cross-Sectional Variables		
High_R2	Own calculations	Indicator variable taking the value of 1 for industries with high comovement in asset growth, and 0 otherwise. To measure comovement in asset growth, we first obtain the R-squared from regressions, by industry, of firms' standardized asset growth on year indicators following Guiso and Parigi (1999). We then residualize the R-Squared with respect to the number of firms operating in the industry, and define high-comovement industries as those in the upper quartile of the distribution of residualized R-squareds.
# of Medium Peers	Own calculations	Log of 1 plus the number of "medium" firms in a given industry, county, and year
Medium Abnormal Disclosure	Own calculations	The difference between the log of 1 plus the aggregate number of characters disclosed by "medium" peers in the mandatory regime and the log of 1 plus the aggregate number of characters disclosed by medium peers predicted for the voluntary regime. "Medium" peers are defined as the number of "medium" firms in a given industry, county, and year.

References

Admati, A. R., and P. Pfleiderer. 2000. Forcing firms to talk: financial disclosure regulation and externalities. *Review of Financial Studies* 13: 479-519.

Angelucci, M., and V. D. Maro. 2015. Program evaluation and spillover effects. *World Bank Working Paper*.

Arrunada, B. 2011. Mandatory Accounting Disclosure by Small Private Companies. *European Journal of Law and Economics* 32: 377-413.

Badertscher, B., N. Shroff, and H. D. White. 2013. Externalities of public firm presence: Evidence from private firms' investment decisions. *Journal of Financial Economics* 109: 682-706.

Baginski, S. P., and L. A. Hinson. 2016. Cost of capital free-riders. *Accounting Review* 91: 1291-313.

Baird, S., J. A. Bohren, C. McIntosh, and B. Özler. 2014. Designing experiments to measure spillover effects. *World Bank Working Paper*.

Balakrishnan, K., M. B. Billings, B. Kelly, and A. Ljungqvist. 2014. Shaping liquidity: on the causal effects of voluntary disclosure. *Journal of Finance* 69: 2237-78.

Beatty, A., S. Liao, and J. J. Yu. 2013. The spillover effect of fraudulent financial reporting on peer firms' investments. *Journal of Accounting and Economics* 55: 183-205.

Bens, D. A., P. G. Berger, and S. J. Monahan. 2011. Discretionary disclosure in financial reporting: an examination comparing internal firm data to externally reported segment data. *Accounting Review* 86: 417-49.

Berger, P. G., M. Minnis, and A. G. Sutherland. 2017. Commercial lending concentration and bank expertise: evidence from borrower financial statements. *Journal of Accounting and Economics* 64: 253-77.

Bernard, D. 2016. Is the risk of product market predation a cost of disclosure? *Journal of Accounting and Economics* 62: 305-25.

Bernard, D., D. Burgstahler, and D. Kaya. 2018. Size management by European private firms to minimize proprietary costs of disclosure. *Journal of Accounting and Economics* 66: 94-122.

Breuer, M. 2018. How does financial reporting regulation affect market-wide resource allocation? *Working paper*; Available at SSRN: www.ssrn.com/abstract_id=3063320.

Breuer, M., K. Hombach, and M. A. Müller. 2017. The economics of firms' public disclosure: theory and evidence. Working paper; Available at SSRN: www.ssrn.com/abstract_id=3037002.

———. 2018. How does financial reporting regulation affect firms' banking? *Review of Financial Studies* 31: 1265-97.

Coffee, J. C. 1984. Market failure and the economic case for a mandatory disclosure system. *Virginia Law Review* 70: 717-53.

Crépon, B., E. Duflo, M. Gurgand, R. Rathelot, and P. Zamora. 2013. Do labor market policies have displacement effects? Evidence from a clustered randomized experiment. *Quarterly Journal of Economics* 128: 531-80.

Dambra, M., L. C. Field, and M. T. Gustafson. 2015. The JOBS Act and IPO volume: Evidence that disclosure costs affect the IPO decision. *Journal of Financial Economics* 116: 121-43.

De Fontenay, E. 2017. The deregulation of private capital and the decline of the public company. *Hastings Law Journal* 68: 445-502.

Dedman, E., and C. Lennox. 2009. Perceived competition, profitability and the withholding of information about sales and the cost of sales. *Journal of Accounting and Economics* 48: 210-30.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2017. The U.S. listing gap. *Journal of Financial Economics* 123: 464-87.

Duguay, R., M. Minnis, and A. G. Sutherland. 2018. Regulatory Spillovers in Common Audit Markets. *Working paper;* Available at SSRN: www.ssrn.com/abstract_id=3020316.

Durnev, A. R. T., and C. Mangen. 2009. Corporate investments: earning from restatements. *Journal of Accounting Research* 47: 679-720.

Dye, R. A. 1990. Mandatory versus voluntary disclosures: the cases of financial and real externalities. *Accounting Review* 65: 1-24.

Easterbrook, F. H., and D. R. Fischel. 1984. Mandatory disclosure and the protection of investors. *Virginia Law Review* 70: 669-715.

Engelberg, J., A. Ozoguz, and S. Wang. 2018. Know thy neighbor: Industry clusters, information spillovers and market efficiency. *Journal of Financial and Quantitative Analysis* 53: 1937-1961.

European Commission. 2011. Financial Reporting: burden reduction for micro-entities – Frequently Asked Questions. Press release available under: http://europa.eu/rapid/press-release_MEMO-11-911_en.htm?locale=en, accessed 29 February 2016.

Fishman, M. J., and K. M. Hagerty. 1989. Disclosure Decisions by Firms and the Competition for Price Efficiency. *The Journal of Finance* 44: 633-46.

Foster, G. 1980. Externalities and Financial Reporting. *Journal of Finance* 35: 521-33.

———. 1981. Intra-industry information transfers associated with earnings releases. *Journal of Accounting and Economics* 3: 201-32.

Fox, M. B. 1999. Retaining mandatory securities disclosure: why issuer choice is not investor empowerment. *Virginia Law Review* 85: 1335-419.

Gao, F., J. S. Wu, and J. Zimmerman. 2009. Unintended consequences of granting small firms exemptions from securities regulation: evidence from the Sarbanes-Oxley Act. *Journal of Accounting Research* 47: 459-506.

Gao, X., J. R. Ritter, and Z. Zhu. 2013. Where have all the IPOs gone? *Journal of Financial and Quantitative Analysis* 48: 1663-92.

Garmaise, M. J., and G. Natividad. 2015. Spillovers in Local Banking Markets. *Review of Corporate Finance Studies* 5: 139-65.

———. 2016. Spillovers in Local Banking Markets. *Review of Corporate Finance Studies* 5: 139-65.

Gassen, J., and M. N. Muhn. 2018. Financial Transparency of Private Firms: Evidence from a Randomized Field Experiment. *Working paper;* Available at SSRN: www.ssrn.com/abstract=3290710.

Goldstein, I., and L. Yang. 2017. Information disclosure in financial markets. *Annual Review of Financial Economics* 9: 101-25.

Grossman, S. J. 1981. The informational role of warranties and private disclosure about product quality. *Journal of Law & Economics* 24: 461.

Grossman, S. J., and O. D. Hart. 1980. Disclosure laws and takeover bids. *Journal of Finance* 35: 323-34.

Guiso, L., and G. Parigi. 1999. Investment and demand uncertainty. *The Quarterly Journal of Economics* 114: 185-227.

Hail, L., A. Tahoun, and C. Wang. 2014. Dividend payouts and information shocks. *Journal of Accounting Research* 52: 403-56.

Jung, W.-O., and Y. K. Kwon. 1988. Disclosure when the market is unsure of information endowment of managers. *Journal of Accounting Research* 26: 146-53.

Kitching, J., E. Kašperová, and J. Collis. 2015. The contradictory consequences of regulation: The influence of filing abbreviated accounts on UK small company performance. *International Small Business Journal* 33: 671-88.

Kurlat, P., and L. Veldkamp. 2015. Should we regulate financial information? *Journal of Economic Theory* 158, Part B: 697-720.

Leland, H. E., and D. H. Pyle. 1977. Information asymmetries, financial structure, and financial intermediation. *Journal of Finance* 32: 371-87.

Leuz, C., and P. D. Wysocki. 2016. The economics of disclosure and financial reporting regulation: evidence and suggestions for future research. *Journal of Accounting Research* 54: 525.

Lin, Y., Y. Mao, and Z. Wang. 2018. Institutional ownership, peer pressure, and voluntary disclosures. *The Accounting Review* 93: 283-308.

Litjens, R., and J. Suijs. 2014. Supply and demand of proprietary information. *Working paper*.

Ma, M. 2017. Economic links and the spillover effect of earnings quality on market risk. *Accounting Review* 92: 213-45.

Merton, R. C. 1987. A simple model of capital market equilibrium with incomplete information. *Journal of Finance* 42: 483-510.

Minnis, M., and N. Shroff. 2017. Why Regulate Private Firm Disclosure and Auditing? *Accounting and Business Research* 47: 473-502.

Ross, S. A. 1977. The determination of financial structure: the encentive-signalling approach. *Bell Journal of Economics* 8: 23-40.

Rotemberg, M. 2017. Equilibrium effects of firm subsidies. *Working paper*.

Savor, P., and M. Wilson. 2016. Earnings announcements and systematic risk. *Journal of Finance* 71: 83-138.

Shroff, N., R. Verdi, and B. P. Yost. 2017. When does the peer information environment matter? *Journal of Accounting and Economics* 64: 183-214.

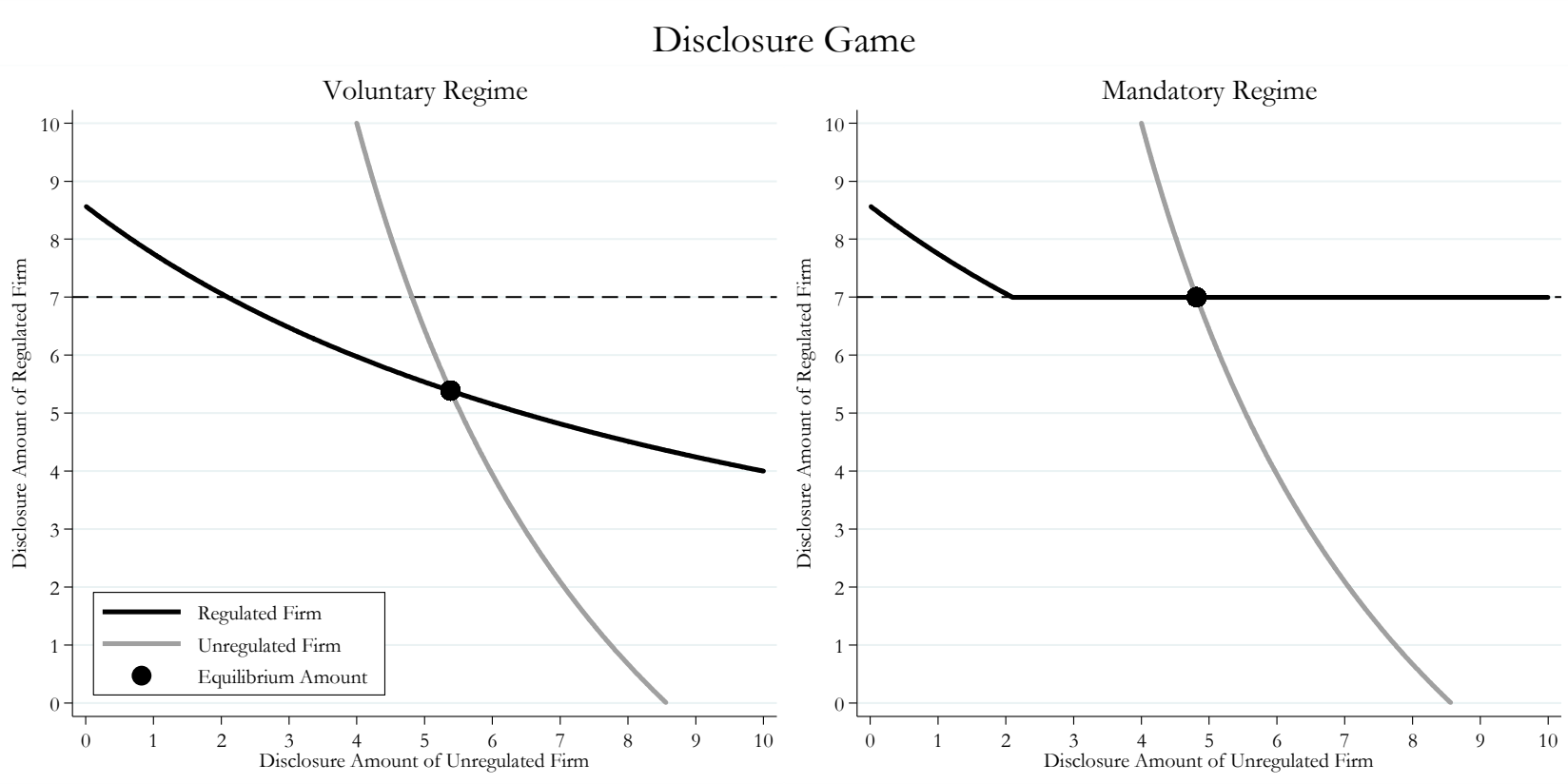
Verrecchia, R. E. 1983. Discretionary disclosure. *Journal of Accounting and Economics* 5: 179-94.

———. 1990. Information quality and discretionary disclosure. *Journal of Accounting and Economics* 12: 365-80.

Zingales, L. 2009. The Future of Securities Regulation. *Journal of Accounting Research* 47: 391-425.

Figures & Tables

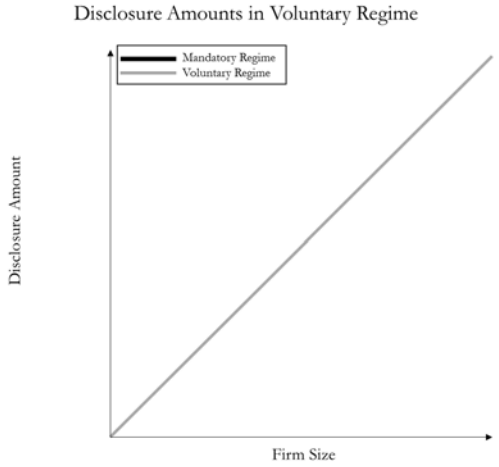
Figure 1



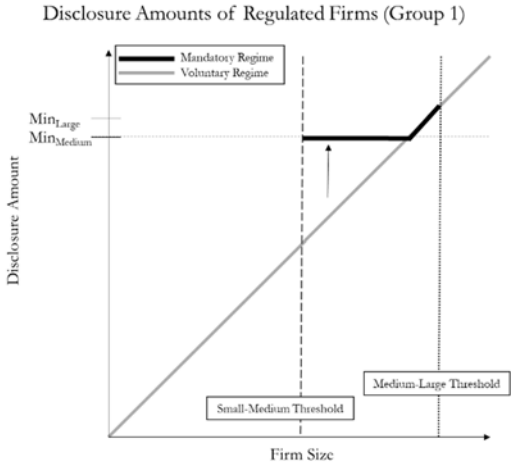
This figure illustrates the disclosure game and the predicted effect of the disclosure regulation on regulated and unregulated firms' disclosure amount (or precision). The figure is based on Figure 3 of Admati and Pfleiderer (2000). The lines depict the firms' best response functions (i.e., a firm's disclosure amount as a function of the other firm's disclosure amount). The black dot represents the equilibrium disclosure amounts of the two disclosure games. The dotted line marks the minimum-disclosure requirement applying to the regulated firm in the mandatory regime. In the voluntary regime (left side), both firms provide a disclosure amount of 5.3. In the mandatory regime (right side), the best response function of the regulated firm is constrained from below due to the minimum-disclosure requirement of 7. As a consequence, the regulated firm provides a disclosure amount of 7 and the unregulated firm provides a disclosure amount of 4.8 in the mandatory regime. The parameters chosen for the best response functions correspond to the values in Figure 3 of Admati and Pfleiderer (2000). The only exception is the correlation parameter between the two firms for which we choose a higher value (0.95) to better illustrate our prediction. Note that we do not consider any discontinuities in the best response functions as the alternative non-disclosure equilibrium derived by Admati and Pfleiderer (2000) is ruled out in our setting where all firms are subject to a general disclosure mandate (with varying minimum disclosure requirements).

Figure 2

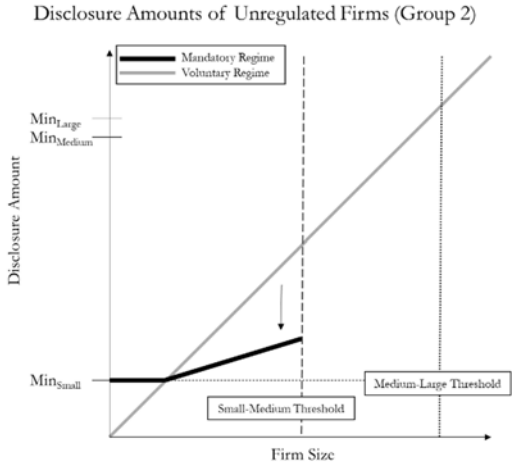
Panel A



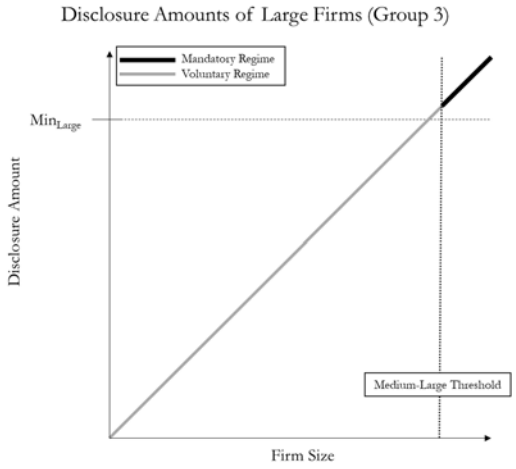
Panel B



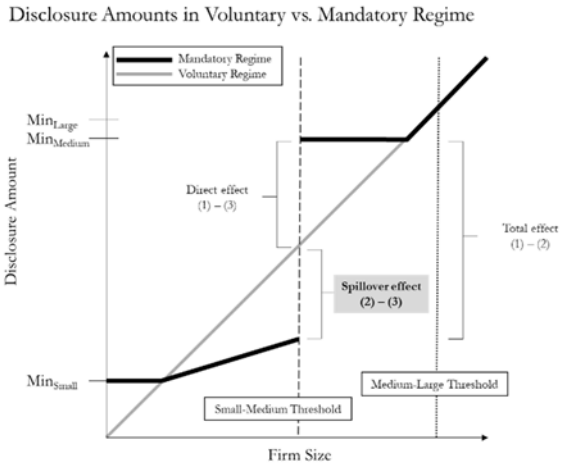
Panel C



Panel D

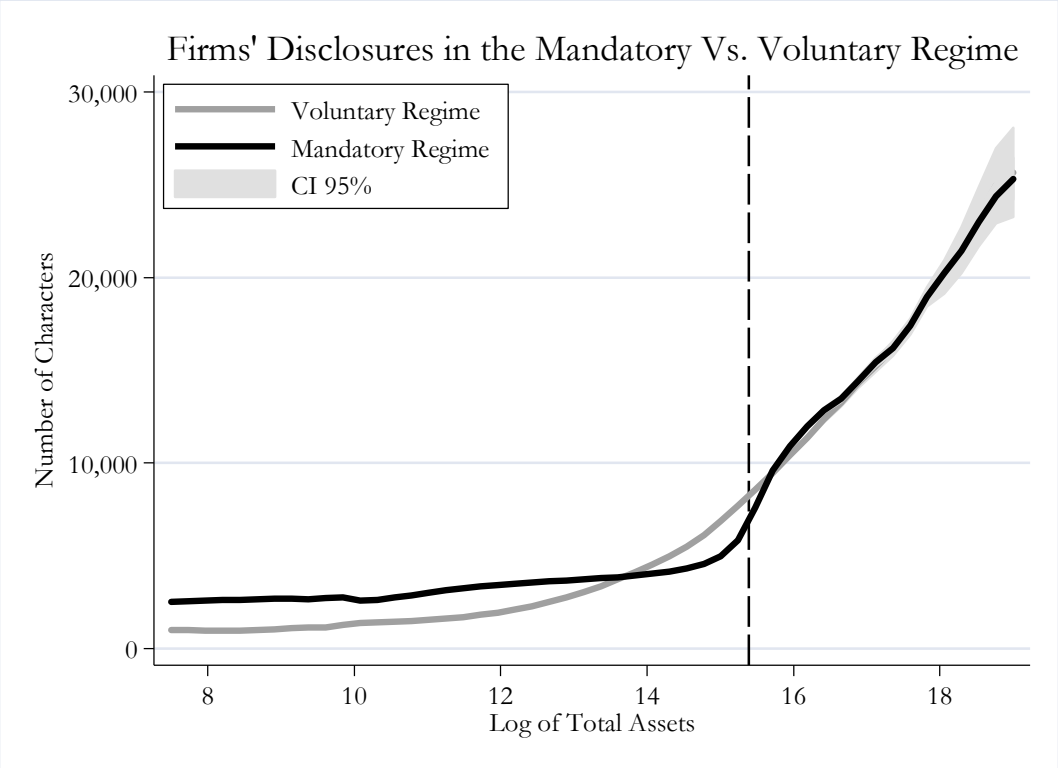


Panel E



This figure illustrates our research design described in Section 4. Panel A represents the relation between disclosure and firm size in a voluntary regime (without increased disclosure requirements for regulated firms). Panel B illustrates the disclosures of regulated firms, which are directly affected by the regulation (group (1)). Panel C illustrates the disclosures of unregulated firms, which are indirectly affected by the regulation (group (2)). Panel D illustrates the disclosures of large firms, which are neither directly nor indirectly affected by the regulation (group (3)). In our empirical tests, we use these firms' disclosures observed in the mandatory regime to derive a disclosure multiple, allowing us to predict the disclosures of group (1) and group (2) in the voluntary regime. Panel E summarizes the direct, indirect, and total effect of the regulation. In our main tests, we document the direct effect (the disclosure gap between group (1) and group (3)) and the indirect effect (the disclosure gap between group (2) and group (3)) of the regulation. In our cross-sectional tests, we examine variation in the total effect of the regulation (the disclosure gap between group (1) and group (2)). Note that the total effect comprises the direct effect and the indirect effect of the regulation (the gap between groups (1) and (3) plus the gap between groups (2) and (3)) and is independent of the disclosures of group (3).

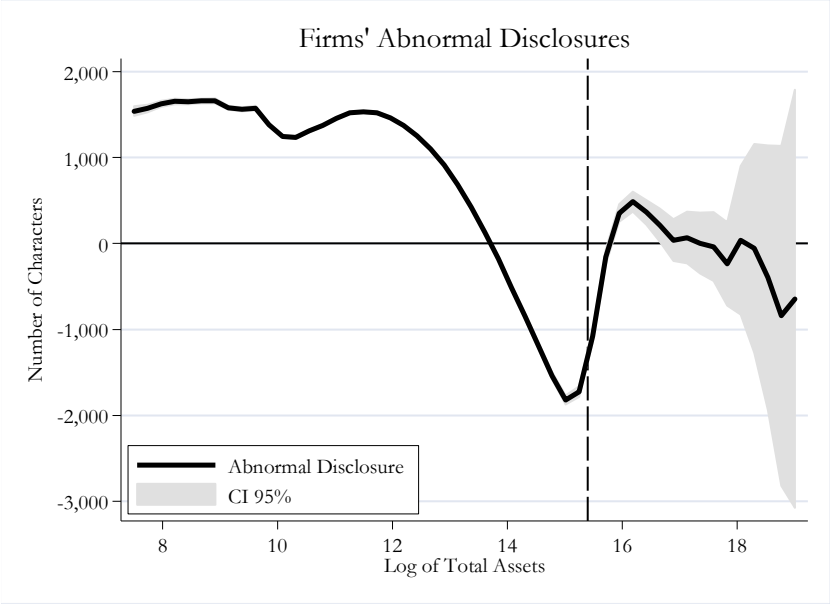
Figure 3



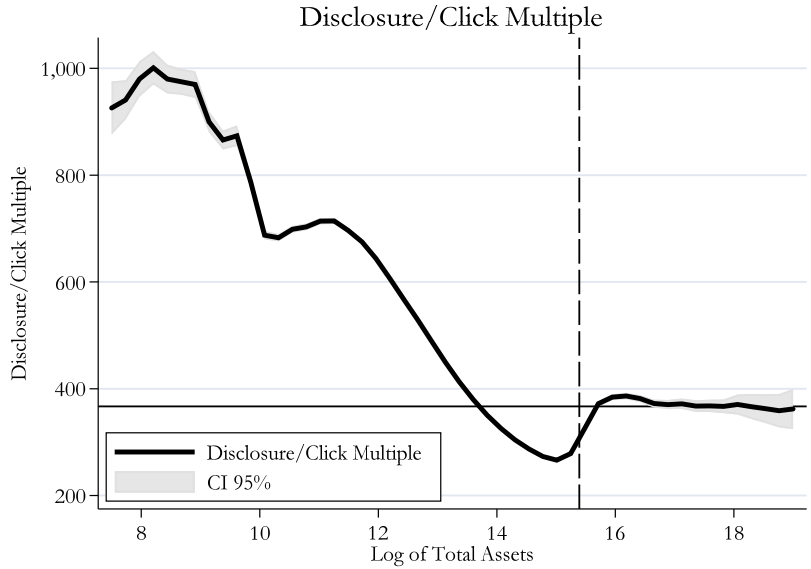
This figure plots the local averages of firms' disclosures observed in the mandatory regime (black line) and their disclosures predicted for the voluntary regime (gray line) as a function of firm size (measured by the logarithm of total assets). To predict firms' disclosures in the voluntary regime, we use firms' observed number of clicks, multiplied by a benchmark disclosure/click multiple derived from the largest firms (for details, refer to Section 4). Local averages are calculated using a kernel regression with an Epanechnikov kernel. The shaded gray areas present 95% confidence bands. The vertical line presents the regulatory threshold relating to total assets for "small" and "medium" firms (€ 4.84 million).

Figure 4

Panel A

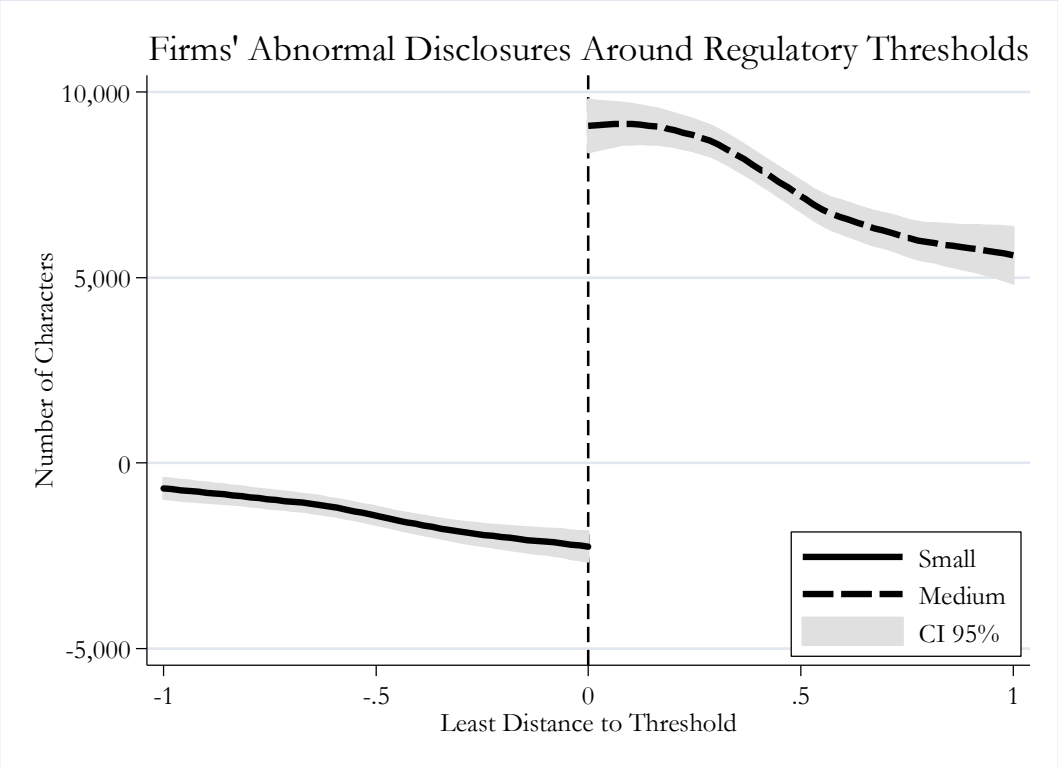


Panel B



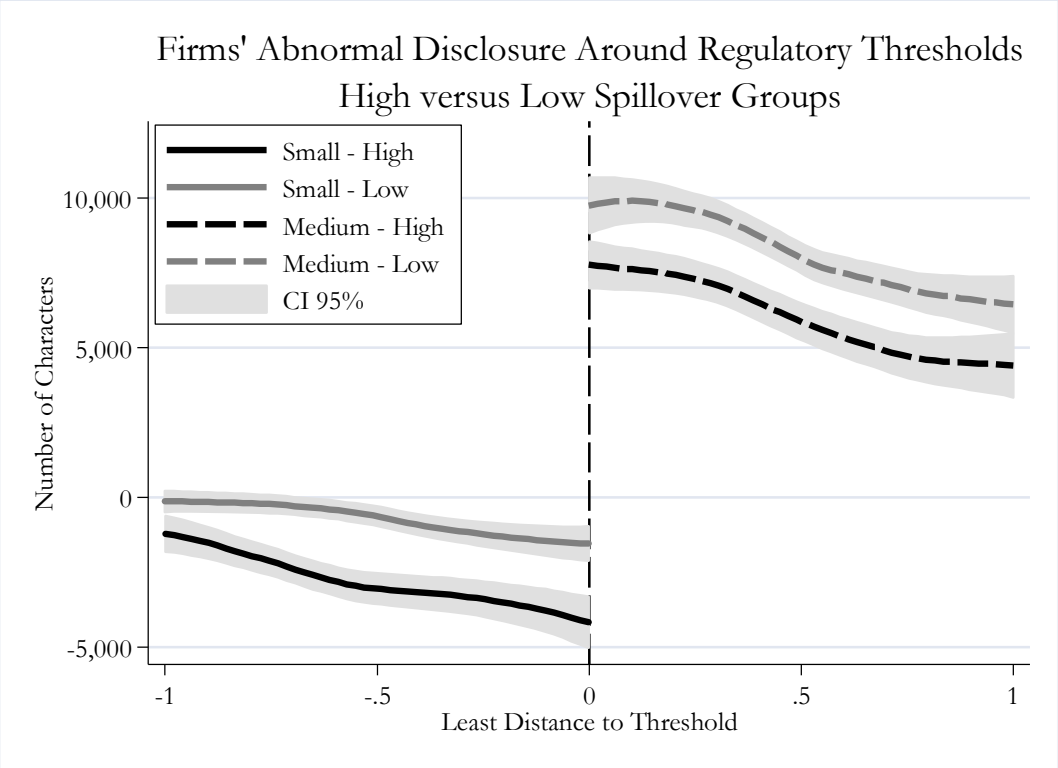
This figure plots the local average of firms' abnormal disclosures (Panel A) and their disclosure/click multiple (Panel B) as a function of firm size (measured by the logarithm of total assets). In Panel A, the black line presents firms' abnormal disclosures, measured by the difference in the number of characters of firms' disclosures observed in the mandatory regime and firms' disclosures predicted for the voluntary regime. In Panel B, the black line presents firms' number of characters observed in the mandatory regime divided by their number of clicks. The horizontal black line in Panel B marks our benchmark disclosure/click multiple (around 365 characters per click) derived from the largest firms (for details, refer to Section 4). Local averages are calculated using a kernel regression with an Epanechnikov kernel. The shaded gray areas present 95% confidence bands. The vertical line presents the regulatory threshold relating to total assets for "small" and "medium" firms.

Figure 5



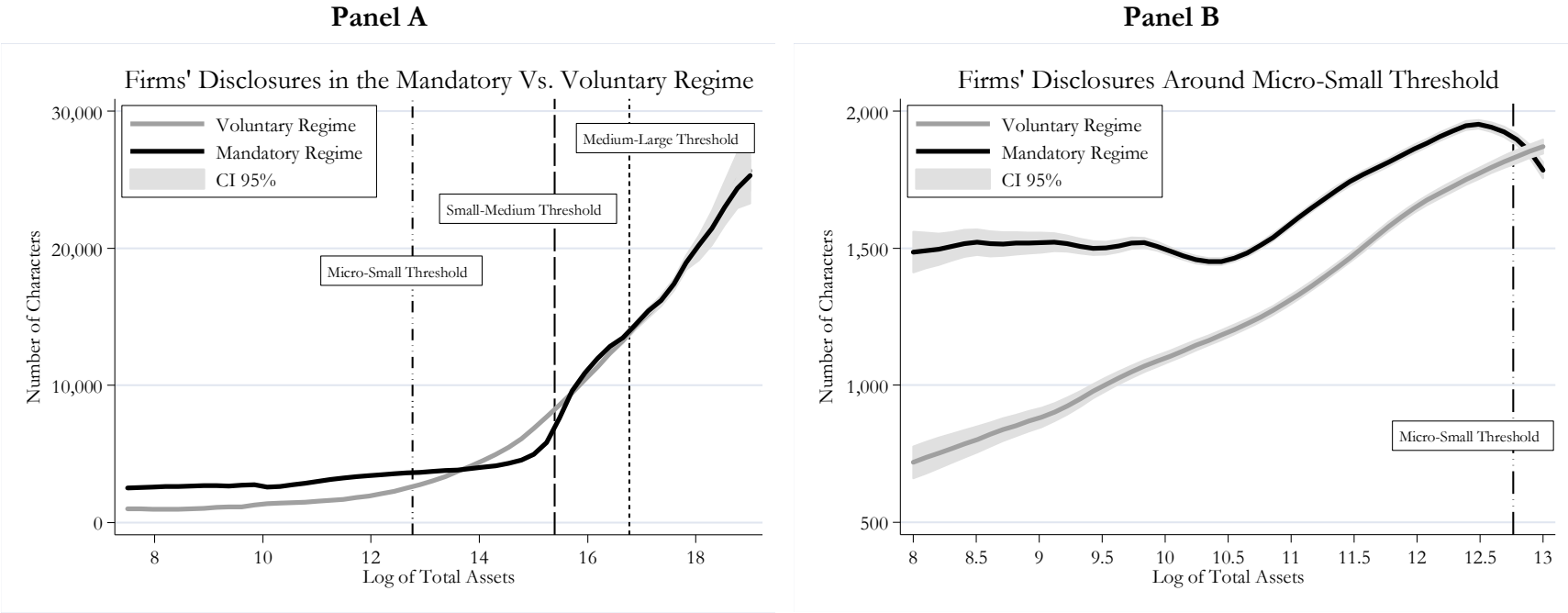
This figure plots local averages of abnormal disclosures for firms' around the regulatory thresholds. On the x-axis, we use a combined size dimension labeled as "least distance to threshold." In our setting, firms' regulatory size class ("small" versus "medium") is determined by two out of three size criteria (total assets, sales, and employees). The least distance to the threshold dimension is the second highest value of the set of our three relative distances to the respective regulatory thresholds (for details, see Breuer, Hombach, and Müller 2018). The solid (dashed) line shows abnormal disclosures of "small" ("medium") firms to the left (right) of the threshold. Abnormal disclosures are measured by the difference in the number of characters of firms' disclosures observed in the mandatory regime and firms' disclosures predicted for the voluntary regime. Local averages are calculated using a kernel regression with an Epanechnikov kernel. The shaded gray areas present 95% confidence bands. The vertical line presents the regulatory threshold for "small" and "medium" firms.

Figure 6



This figure shows "small" and "medium" firms' abnormal disclosures separately in high versus low information spillover groups. On the x-axis, we use a combined size dimension labeled as "least distance to threshold." The black (gray) lines present local averages in firms' abnormal disclosures in high (low) spillover groups, where high (low) spillover groups are defined as industries with a high (low) asset comovement. The solid (dashed) lines present "small" ("medium") firms' abnormal disclosures. Abnormal disclosures are measured by the difference in the number of characters of firms' disclosures observed in the mandatory regime and firms' disclosures predicted for the voluntary regime. Local averages are calculated using a kernel regression with an Epanechnikov kernel. The shaded gray areas present 95% confidence bands. The vertical line presents the regulatory threshold for "small" and "medium" firms.

Figure 7



This figure illustrates firms' disclosures in our two placebo settings (Section 7.2). Panel A shows firms' disclosures observed for the mandatory regime and disclosures predicted for the voluntary regime as a function of firm size as in Figure 3. Besides the small-medium threshold, Panel A includes as vertical lines the medium-large threshold distinguishing "medium" and "large" firms, as well as the micro-small threshold distinguishing "micro" and "small" firms. Note that the regulatory category of "micro" firms was introduced only after our main sample period. Panel B shows the disclosures of "micro" firms in the mandatory and a voluntary regime around the micro-small threshold. The sample comprises the 2012 financial statements by firms classified as "micro" firms by the Federal Gazette. Disclosures in the mandatory regime are measured by the number of characters observed in "micro" firms' 2012 financial statements. We predict "micro" firms' disclosures in the voluntary regime using their number of clicks on the prior year's financial statements (i.e., before any relaxations applied to "micro" firms). Local averages are calculated using a kernel regression with an Epanechnikov kernel. The shaded gray areas present 95% confidence bands.

Table 1

Correspondence Table

Group	Conceptual Description	Operationalization (Size Classes)	Disclosures (Mandatory vs. Voluntary Regime)	Operationalization (Disclosure/Click Multiple)	Operationalization (Predicted Voluntary Regime)
(1)	(2)	(3)	(4)	(5)	(6)
1	*Regulated* firms (**Direct treatment group**)	"**Medium**" firms around the small-medium thresholds	$Q_1^{Mandatory} > Q_1^{Voluntary}$	$Q_1^{Mandatory}/N_1 > Q_3^{Voluntary}/N_3$ $Q_1^{Mandatory}/N_1 > \beta$	$Q_1^{Mandatory} > \left(Q_3^{Voluntary}/N_3\right)N_1$ $Q_1^{Mandatory} > \beta N_1$
2	*Unregulated* firms potentially affected by spillovers (**Indirect treatment group**)	"**Small**" firms around the small-medium thresholds	$Q_2^{Mandatory} < Q_2^{Voluntary}$	$Q_2^{Mandatory}/N_2 < Q_3^{Voluntary}/N_3$ $Q_2^{Mandatory}/N_2 < \beta$	$Q_2^{Mandatory} < \left(Q_3^{Voluntary}/N_3\right)N_2$ $Q_2^{Mandatory} < \beta N_2$
3	Unregulated firms unaffected by spillovers (**Control group**)	**Largest** firms	$Q_3^{Mandatory} = Q_3^{Voluntary}$	$Q_3^{Mandatory}/N_3 = Q_3^{Voluntary}/N_3$ $Q_3^{Mandatory}/N_3 = \beta$	$Q_3^{Mandatory} = \left(Q_3^{Voluntary}/N_3\right)N_3$ $Q_3^{Mandatory} = \beta N_3$

This tables summarizes the links between our conceptual constructs of interest and their empirical counterparts. Column (2) provides conceptual descriptions of the different groups of firms we need to identify the spillover effects of the disclosure regulation. Column (3) lists the types of firms in our institutional setting used to operationalize the conceptual firm groups. Column (4) summarizes the predicted relative disclosures in the mandatory versus the voluntary regime. Columns (5) and (6) operationalize the disclosure quantity comparison. To uncover the unobserved disclosures in the voluntary regime (absent heightened "medium" firm disclosure requirements), we use the benchmark disclosure/click multiple derived from the largest firms (group 3). $Q_i^{Mandatory}$ denotes the disclosure amount in the mandatory regime of firms in group i (with $i=1$ for "medium" firms, $i=2$ for "small" firms, and $i=3$ for the largest firms). $Q_i^{Voluntary}$ denotes the disclosure amount in the voluntary regime of firms in group i. N_i denotes the number of stakeholders interested in the financial statements of firms in group i. β is the disclosure/click multiple which reflects the number of characters per stakeholder disclosed by firms in a voluntary regime and is derived from the largest firms' disclosures and number of stakeholders as shown in row 3 ($Q_3^{Mandatory}/N_3 = \beta$).

Table 2

Descriptive Statistics

Panel A: "Small" Firms

	N	Mean	SD	P25	P50	P75
Variables used in main tests (Figures 3 - 6)						
Disclosure in Mandatory Regime (Number of Characters)	2,045,395	3,468	1,731	2,444	3,195	4,136
Clicks	2,045,395	8	16	1	4	9
Disclosure in Voluntary Regime (Number of Characters)	2,045,395	2,761	5,838	367	1,468	3,303
Abnormal Disclosure (Number of Characters)	2,045,395	707	5,870	-17	1,603	2,729
Voluntary Sales Disclosure (Indicator)	2,045,395	0.30	0.00	0.00	0.00	1.00
Publication Lag (Number of Days)	2,045,395	376	130	346	375	397
Total Assets (million Euro)	2,045,395	2.00	87.10	0.05	0.21	0.75
Total Assets (Logarithm)	2,045,395	12.26	1.91	10.90	12.26	13.53
Variables used in cross-sectional tests (Tables 4 and 6)						
Abnormal Disclosure (Logarithm)	45,434	0.94	2.10	-0.22	0.52	1.38
Disclosure in Mandatory Regime (Logarithm)	45,434	8.37	0.48	8.07	8.33	8.60
Publication Lag (Logarithm)	45,434	5.85	0.33	5.82	5.92	5.98
Sales (million Euro)	45,434	2.00	2.48	0.39	1.00	2.57
Sales (Logarithm)	45,434	13.75	1.36	12.87	13.82	14.76
Employees (Number)	45,434	16	20	3	8	20
Employees (Logarithm)	45,434	2.28	1.06	1.39	2.20	3.04
# of Medium Peers (Logarithm)	45,434	1.84	1.28	1.10	1.61	2.64
Medium Abnormal Disclosure (Logarithm)	45,434	1.09	2.37	0.03	0.46	0.97
Comovement (R2)	45,434	0.0090	0.0073	0.0041	0.0087	0.0092
Residual R2	45,434	-0.0004	0.0070	-0.0061	-0.0020	0.0053
High R2 (Indicator)	45,434	0.30	0.46	0	0	1
Variables used in validation tests (Table 5)						
Age (Number of Years)	35,346	15.77	14.53	6.00	12.00	20.00
Age (Logarithm)	35,346	2.46	0.92	1.95	2.56	3.04
Owners (Number)	35,346	1.84	1.09	1.00	2.00	2.00
Owners (Logarithm)	35,346	0.47	0.50	0.00	0.69	0.69
Institutional Owner (Indicator)	35,346	0.03	0.15	0.00	0.00	0.00
Banks (Number)	35,346	1.17	0.87	1.00	1.00	2.00
Banks (Logarithm)	35,346	0.69	0.42	0.69	0.69	1.10
Cash over Total Assets	35,346	0.17	0.21	0.01	0.09	0.26
Fixed Assets over Total Assets	35,346	0.20	0.23	0.03	0.11	0.29
Liabilities over Total Assets	35,346	0.58	0.30	0.31	0.61	0.86
Return on Assets	35,346	0.03	0.21	-0.02	0.03	0.11
Loss Indicator	35,346	0.29	0.46	0.00	0.00	1.00

Panel B: "Medium" Firms						
	N	Mean	SD	P25	P50	P75
Variables used in main tests (Figures 3 – 6, Table 3)						
Disclosure in Mandatory Regime (Number of Characters)	49,577	22,051	8,555	16,597	20,310	25,466
Clicks	49,577	52	46	24	42	68
Disclosure in Voluntary Regime (Number of Characters)	49,577	19,106	16,948	8,808	15,414	24,956
Abnormal Disclosure (Number of Characters)	49,577	2,945	18,433	-4,543	5,034	12,858
Voluntary Sales Disclosure (Indicator)	49,577	0.42	0	0	0	1
Publication Lag (Number of Days)	49,577	373	105	343	376	404
Total Assets (million Euro)	49,577	18	99	6	9	15
Total Assets (Logarithm)	49,577	16.12	0.83	15.63	16.03	16.51
Variables used in cross-sectional tests (Tables 4 and 6)						
Abnormal Disclosure (Logarithm)	17,639	0.53	0.93	-0.08	0.45	1.06
Disclosure in Mandatory Regime (Logarithm)	17,639	10.04	0.35	9.80	10.02	10.26
Publication Lag (Logarithm)	17,639	5.86	0.29	5.79	5.92	6.00
Sales (million Euro)	17,639	21.61	15.05	11.70	17.74	27.30
Sales (Logarithm)	17,639	16.68	0.67	16.28	16.69	17.12
Employees (Number)	17,639	109	91	53	85	138
Employees (Logarithm)	17,639	4.38	0.87	3.99	4.45	4.93
# of Medium Peers (Logarithm)	17,639	1.83	1.31	0.69	1.61	2.64
Medium Abnormal Disclosure (Logarithm)	17,639	1.07	2.39	0.00	0.44	0.92
Comovement (R2)	17,639	0.0127	0.0099	0.0087	0.0090	0.0155
Residual R2	17,639	0.0020	0.0090	-0.0044	0.0001	0.0053
High R2 (Indicator)	17,639	0.34	0.47	0	0	1
Variables used in validation test (Table 5)						
Age (Number of Years)	6,974	24.24	19.22	11.00	19.00	31.00
Age (Logarithm)	6,974	2.96	0.75	2.48	3.00	3.47
Owners (Number)	6,974	2.17	1.39	1.00	2.00	3.00
Owners (Logarithm)	6,974	0.60	0.57	0.00	0.69	1.10
Institutional Owner (Indicator)	6,974	0.06	0.20	0.00	0.00	0.00
Banks (Number)	6,974	1.88	1.13	1.00	2.00	3.00
Banks (Logarithm)	6,974	0.97	0.44	0.69	1.10	1.39
Cash over Total Assets	6,974	0.12	0.16	0.01	0.05	0.16
Fixed Assets over Total Assets	6,974	0.27	0.26	0.05	0.18	0.43
Liabilities over Total Assets	6,974	0.52	0.27	0.31	0.54	0.74
Return on Assets	6,974	0.04	0.12	0.00	0.03	0.08
Loss Indicator	6,974	0.18	0.38	0.00	0.00	0.00

Panel C: "Large" Firms						
	N	Mean	SD	P25	P50	P75
Variables used in main tests (Figures 3 – 6, Table 3)						
Disclosure in Mandatory Regime (Number of Characters)	14,099	32,482	15,524	23,014	29,226	37,876
Clicks	14,099	95	93	39	71	121
Disclosure in Voluntary Regime (Number of Characters)	14,099	34,825	34,227	14,313	26,057	44,407
Abnormal Disclosure (Number of Characters)	14,099	-2,343	35,573	-14,229	4,553	16,601
Voluntary Sales Disclosure (Indicator)	14,099	0	0	0	0	0
Publication Lag (Number of Days)	14,099	356	120	298	364	404
Total Assets (million Euro)	14,099	166	828	26	44	95
Total Assets (Logarithm)	14,099	17.70	1.44	17.07	17.59	18.37
Variables used in cross-sectional tests (Table 4 and 6)						
Abnormal Disclosure (Logarithm)	11,087	0.15	0.90	-0.46	0.11	0.69
Disclosure in Mandatory Regime (Logarithm)	11,087	10.31	0.36	10.06	10.29	10.53
Publication Lag (Logarithm)	11,087	5.84	0.32	5.73	5.91	6.00
Sales (million Euro)	11,087	134.66	215.08	46.02	71.79	129.82
Sales (Logarithm)	11,087	18.19	0.99	17.64	18.09	18.68
Employees (Number)	11,087	403	478	125	268	470
Employees (Logarithm)	11,087	5.41	1.25	4.84	5.59	6.15
# of Medium Peers (Logarithm)	11,087	1.79	1.31	0.69	1.61	2.56
Medium Abnormal Disclosure (Logarithm)	11,087	1.06	2.40	0.00	0.42	0.95
Comovement (R2)	11,087	0.0139	0.0101	0.0087	0.0092	0.0191
Residual R2	11,087	0.0025	0.0091	-0.0024	0.0001	0.0059
High R2 (Indicator)	11,087	0.34	0.47	0	0	1
Variables used in validation test (Table 5)						
Age (Number of Years)	4,723	26.49	21.76	11.00	20.00	37.00
Age (Logarithm)	4,723	3.00	0.83	2.48	3.04	3.64
Owners (Number)	4,723	2.09	1.33	1.00	2.00	3.00
Owners (Logarithm)	4,723	0.57	0.55	0.00	0.69	1.10
Institutional Owner (Indicator)	4,723	0.07	0.22	0.00	0.00	0.00
Banks (Number)	4,723	1.89	1.18	1.00	2.00	3.00
Banks (Logarithm)	4,723	0.97	0.45	0.69	1.10	1.39
Cash over Total Assets	4,723	0.09	0.14	0.00	0.03	0.12
Fixed Assets over Total Assets	4,723	0.26	0.26	0.04	0.18	0.42
Liabilities over Total Assets	4,723	0.48	0.27	0.25	0.47	0.70
Return on Assets	4,723	0.03	0.10	0.00	0.01	0.06
Loss Indicator	4,723	0.15	0.35	0.00	0.00	0.00

Table 3

Firms' Average Disclosures Around Small-Medium Thresholds

Panel A: Abnormal Disclosures (Number of Characters)

Control function	Linear		Piecewise Linear	
	Small	Medium	Small	Medium
Constant	-3,579***	8,440***	-3,796***	8,272**
	(244)	(1,325)	(307)	(3293)
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes
Observations	45,434	17,639	45,434	17,639
# Clusters	398	397	398	397
Adjusted R-Squared	0.157	0.226	0.299	0.184

Panel B: Disclosure in Voluntary Regime (Number of Characters)

Control function	Linear		Piecewise Linear	
	Small	Medium	Small	Medium
Constant	10,161***	13,002***	9,818***	12,677***
	(218)	(1,181)	(259)	(2,747)
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes
Observations	45,434	17,639	45,434	17,639
# Clusters	398	397	398	397
Adjusted R-Squared	0.246	0.199	0.356	0.127

Panel C: Magnitude of Abnormal Disclosure

Regulatory Effect	Spillover	Direct	Spillover	Direct
	Small	Medium	Small	Medium
% of Disclosure in Voluntary Regime	-35%	65%	-46%	65%
Number of Pages	-1.19	2.81	-1.27	2.76

This table presents evidence on the average disclosures of "small" and "medium" firms around the three small-medium thresholds (total assets, sales, and employees). Panel A presents the average constant of a regression of abnormal disclosure on control variables including the regulatory size criteria (log of total assets, log of sales, and log of the number of employees) centered at the threshold values, log of firm age, legal form indicators, and country-industry-year fixed effects. The average constant captures the average level of abnormal disclosures at the three small-medium thresholds (i.e., for the case when the centered total assets, sales, and employees controls are zero). Panel B presents the average constant of a regression of disclosure in a voluntary regime on control variables including the regulatory size criteria (log of total assets, log of sales, and log of the number of employees) centered at the threshold values, log of firm age, legal form indicators, and country-industry-year fixed effects. The average constant captures the average level of disclosure in a voluntary regime at the three small-medium thresholds (i.e., for the case when the centered total assets, sales, and employees controls are zero). Panel C recasts the magnitude of the average abnormal disclosures (Panel A) in terms of percentage of the disclosure in a voluntary regime (Panel B) and in terms of pages (where 3,000 characters correspond to 1 page). *Abnormal Disclosure* is the difference between the firm's number of characters observed in the mandatory regime and the respective number of characters predicted for the voluntary regime. *Disclosure in Voluntary Regime* is firms' number of characters predicted for the voluntary regime. *% of Disclosure in Voluntary Regime* is the percentage of abnormal disclosures (Panel A) relative to the disclosures in a voluntary regime (Panel B). *Number of Pages* is abnormal disclosures (Panel A) divided by the average number of characters per page (3,000). We present estimates using (log-)linear size controls (*Linear*) and piecewise (log-)linear size controls (where we allow the coefficients to vary above and below the threshold) (*Piecewise Linear*). We report standard errors clustered by county in parentheses. *, **, and *** denote statistical significance levels below 10%, 5%, and 1%, respectively.

Table 4

Firms' Disclosure and Strength of Information Spillovers

Panel A: Firms' Disclosure and Asset Growth Comovement

	Abnormal Disclosure	Disclosure in Mandatory Regime	Publication Lag	Voluntary Sales Disclosure
	(1)	(2)	(3)	(4)
Small	-1.040***	-1.122***	-0.046***	0.129***
	(0.040)	(0.017)	(0.007)	(0.015)
Small * High_R2	-0.098***	-0.026**	-0.002	-0.019**
	(0.032)	(0.011)	(0.007)	(0.009)
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes
Observations	54,466	54,466	284,265	637,651
# Clusters	396	396	398	398
Adjusted R-Squared	0.194	0.793	0.101	0.126

Panel B: Firms' Disclosure and Peer Information Environment

	Abnormal Disclosure		Disclosure in Mandatory Regime		Publication Lag		Voluntary Sales Disclosure	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Small	-0.820***	-0.706***	-1.066***	-1.094***	-0.083***	-0.054***	0.316***	0.235***
	(0.091)	(0.050)	(0.042)	(0.016)	(0.019)	(0.010)	(0.034)	(0.020)
Small * # of Medium Peers	-0.089***		-0.022*		0.013**		-0.066***	
	(0.025)		(0.013)		(0.006)		(0.014)	
Small * Medium Abnormal Disclosure		-0.532***		-0.051***		0.009*		-0.110***
		(0.032)		(0.011)		(0.005)		(0.009)
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,466	54,466	54,466	54,466	284,265	54,466	637,651	139,464
# Clusters	396	396	396	396	398	396	398	398
Adjusted R-Squared	0.194	0.198	0.793	0.793	0.101	0.174	0.127	0.120

This table presents evidence on the cross-sectional variation in firms' disclosures with respect to the expected strength of information spillovers. *Abnormal Disclosure* is the difference between the logarithm of firms' number of characters observed in the mandatory regime less the logarithm of firms' number of characters predicted for the voluntary regime. *Disclosure in Mandatory Regime* is the logarithm of firms' number of characters observed in the mandatory regime. *Publication lag* is the log of the publication lag (measured in terms of number of days between fiscal year-end and publication dated). *Voluntary Sales Disclosure* is an indicator taking the value of one if a firm voluntarily discloses sales information, and zero otherwise. In Panel A, we show how the disclosure gap between "small" and "medium" firms varies with the comovement of fundamentals in a given industry. We regress "small" and "medium" firms' disclosure outcomes on *Small* (an indicator variable that takes the value of 1 if the firm is classified as "small" in a given year, and zero otherwise) and an interaction of *Small* with *High_R2*, a proxy for the comovement of fundamentals in a given industry. To construct *High R2*, we first obtain the R-squared from industry-specific regressions of firms' standardized, year-over-year asset growth on year fixed effects, and residualize the R-squared with respect to the number of firms operating in the same industry. We then construct *High R2* as taking the value of one for industries in the top quartile of the R-squared distribution across industries, and zero otherwise. In Panel B, we show how the disclosure gap between "small" and "medium" firms varies with the richness of the peer information environment. We regress "small" and "medium" firms' disclosure outcomes on *Small* and an interaction of *Small* with proxies for the amount of information provided by firms' "medium" peers. Specifically, we use the logarithm of the number of medium firms operating in the same county-industry-year (*# of Medium Peers*) and the total abnormal disclosures provided by all "medium" peers operating in the same county-industry-year (*Medium Abnormal Disclosure*). All specifications include county-industry-year fixed effects and legal form fixed effects. We further include a control function including the regulatory size criteria (in Columns (1) – (6): log of total assets, log of sales, and log of the number of employees; in Columns (7) – (8): log of total assets and log of the number of employees) and firm age. We report standard errors clustered by county in parentheses. *, **, and *** denote statistical significance levels below 10%, 5%, and 1%, respectively.

Table 5

Disclosure Regulation, Firms' Disclosures, and Number of Clicks

Panel A: Regulatory Class Changes

	Disclosure in Mandatory Regime (Changes)		Number of Clicks (Changes)	
	(1)	(2)	(3)	(4)
Up (Small to Medium)	0.781***		-0.029	
	(0.087)		(0.070)	
Down (Medium to Small)	-0.619***		0.097	
	(0.094)		(0.107)	
Up (Medium to Large)		-0.015		0.016
		(0.023)		(0.054)
Down (Large to Medium)		-0.021		0.115
		(0.039)		(0.097)
Sample Firms	Small, Medium	Medium, Large	Small, Medium	Medium, Large
Size, Age, Legal Form, Other Controls	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes
Observations	9,478	2,341	9,478	2,341
# Clusters (Counties)	342	239	342	239
Adjusted R-Squared	0.236	0.023	0.032	0.033

Panel B: Fixed Effects

	Disclosure in Mandatory Regime		Number of Clicks	
	(1)	(2)	(3)	(4)
Medium	0.719***		0.020	
	(0.055)		(0.049)	
Large		0.029***		-0.006
		(0.009)		(0.029)
Sample Firms	Small, Medium	Medium, Large	Small, Medium	Medium, Large
Size, Age, Legal Form, Other Controls	Yes	Yes	Yes	Yes
Firm and Year FE	Yes	Yes	Yes	Yes
Observations	42,320	11,697	42,320	11,697
# Clusters	398	396	398	396
Adjusted R-Squared	0.195	0.165	0.044	0.087

This table presents the results from first differences (Panel A) and firm fixed effects (Panel B) analyses. *Disclosure in Mandatory Regime* is the logarithm of the number of characters in a firm's filing. *Number of Clicks* is the logarithm of one plus the number clicks a firm's filing received in the 12 months after its publication. The regressions in the Columns 1 and 3 (Columns 2 and 4) are restricted to "small" and "medium" ("medium" and "large" firms). In Panel A, *Up (Small to Medium)* (*Up (Medium to Large)*) takes the value of one for firms switching up in their regulatory size class from "small" to "medium" (from "medium" to "large"), and *Down (Small to Medium)* (*Down (Medium to Large)*) takes the value of one for firms switching down from the "medium" to the "small" (from the "large" to the "medium") regulatory size class. In Panel B, *Medium* (*Large*) takes the value of one when a firm is classified as "medium" ("large"), and zero when it is classified as "small" ("medium"). In Panel A, we include legal form and county-industry-year fixed effects, and control for changes in

firm characteristics including a firm's total assets (log), sales (log), number of employees (log), age (log), number of owners (log), institutional ownership (%), number of banks (log), cash (in % of total assets), and fixed assets (in % of total assets). In Panel B, we include legal form fixed effects, firm fixed effects and year fixed effects and control for the levels of same firm characteristics as in Panel A. We report standard errors clustered by county in parentheses. *, **, and *** denote statistical significance levels below 10%, 5%, and 1%, respectively.

Table 6

Firms' Disclosure and Strength of Information Spillovers: Placebo Tests			
Panel A: Constrained Setting (Micro-Small Threshold)			
	Disclosure in Mandatory Regime (Log)		
	(1)	(2)	(3)
Micro	-0.448***	-0.405***	-0.401***
	(0.011)	(0.038)	(0.035)
Micro * High_R2	0.011		
	(0.016)		
Micro * # of Small Peers		-0.007	
		(0.007)	
Micro * Small Abnormal Disclosures			-0-035
			(0.027)
Size, Age, Legal Form Controls	Yes	Yes	Yes
County-Industry FE	Yes	Yes	Yes
Observations	136,468	136,468	136,468
# Clusters	398	398	398
Adjusted R-Squared	0.21	0.21	0.21

Panel B: Unconstrained Setting (Medium-Large Threshold)

	Abnormal Disclosure			Disclosure in Mandatory Regime			Publication Lag		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Medium	0.015	-0.029	0.163***	-0.044***	-0.069***	-0.026***	0.028***	0.027***	-0.015
	(0.032)	(0.035)	(0.029)	(0.012)	(0.015)	(0.010)	(0.008)	(0.009)	(0.009)
Medium * High R2	-0.051			0.003			-0.002		
	(0.034)			(0.016)			(0.009)		
Medium * # of Large Peers		0.015			0.015**			0.000	
		(0.015)			(0.006)			(0.004)	
Medium * Large Abnormal Disclosures			-0.399***			-0.040***			0.004
			(0.025)			(0.009)			(0.007)
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,113	21,113	21,113	21,113	21,113	21,113	75,095	75,095	21,113
# Clusters	385	385	385	385	385	385	394	394	385
Adjusted R-Squared	0.311	0.31	0.328	0.413	0.413	0.414	0.125	0.125	0.243

This table presents evidence on the cross-sectional variation in firms' disclosure with respect to the strength of the information spillover in two placebo settings. *Abnormal Disclosure* is the difference between the logarithm of firms' observed disclosures less the logarithm of firms' disclosures predicted for the voluntary regime. *Disclosure in Mandatory Regime* is the logarithm of firms' observed disclosures. *Publication lag* is the log of the publication lag (measured in terms of number of days between fiscal year-end and publication dated). *Voluntary Sales Disclosure* is an indicator taking the value of 1 if a firm voluntarily discloses sales information, and zero otherwise. In Panel A, we show results on the disclosure gap between "small" (placebo regulated) and "micro" (placebo unregulated) firms in a constrained setting. *Micro* is an indicator variable taking the value of 1 if a firm is classified as "micro" in a given year, and zero otherwise. *High_R2* is a proxy for the comovement of fundamentals in a given industry. *# of Small Peers* is the number of "small" firms operating in the same county-industry-year. *Small Abnormal Disclosure* is the total abnormal disclosure provided by "small" firms operating in the same county-industry-year. In Panel B, we show results on the disclosure gap between "medium" (placebo unregulated" and "large" (placebo regulated) firms in an unconstrained setting. *Medium* is an indicator variable taking the value of 1 if a firm is classified as "medium" in a given year, and zero otherwise. *High_R2* is a proxy for the comovement of fundamentals in a given industry. *# of Large Peers* is the number of "large" firms operating in the same county-industry-year. *Large Abnormal Disclosure* is the total abnormal disclosure provided by "large" firms operating in the same county-industry-year. In Panel A, all specifications include county-industry fixed effects (given that we only have a cross-section of one year) and legal form fixed effects. In Panel B, all specifications include county-industry-year fixed effects and legal form fixed effects. We further include a control function including all three regulatory size criteria (total assets, sales, employees) and age. We report standard errors clustered by county in parentheses. *, **, and *** denote statistical significance levels below 10%, 5%, and 1%, respectively.

Online Appendix

(For online publication only)

When you talk, I remain silent: Spillover effects of peers' mandatory disclosures on firms' voluntary disclosures

Table of contents

A. Analytical examples

In this section, we provide two stylized analytical examples to illustrate the theoretical foundation and assumptions underlying our empirical strategy. The examples are based on the general cost-benefit trade-off of firms' public disclosure decision. As discussed in detail in Breuer, Hombach, and Müller (2017), firms decide on their public disclosure quantity q (along the intensive margin) by maximizing their net benefit of disclosure:

$$q^* = \arg\max_q \left\{ \left(\sum_{j=1}^{N(q)} p_j(q) \right) q - C(q) \right\} = \arg\max_q \left\{ N(q)\,\bar{p}(q)q - C(q) \right\},$$

where q^* is the optimal (intensive margin) disclosure quality, $p_j(q)$ is the marginal "shadow price" (e.g., reduced adverse selection discount) paid by transacting stakeholder j given disclosure quantity q, $N(q)$ is the number of transacting stakeholders given disclosure quantity q, and $C(q)$ denotes the total disclosure cost given disclosure quantity q. The disclosure benefit can be represented as the product of the number of transacting stakeholders, their average marginal "shadow price" per quantity, and the disclosure quantity ($N(q)\bar{p}(q)q$). Thus, the benefit of firms' public disclosure increases in the number of transacting stakeholders, whereas disclosure costs are independent of the number of transacting stakeholders. This follows because one quantity is provided to all transacting stakeholders (instead of separately to each of them) and can be consumed by all transacting stakeholders (as a result of the non-rivalry property of public goods). Accordingly, the net benefit of firms' public disclosure, as formulated above, is a linear function of firms' number of transacting stakeholders.

Using specific functional form assumptions for the benefit and cost functions, we explore the implications of this relation between firms' net benefit of disclosure and their number of transacting stakeholders for the disclosures/click multiple ($\frac{q^*}{N(q^*)}$) used in our empirical strategy.

Example 1: Constant marginal benefit, increasing marginal costs

In the first analytical example, we assume, for simplicity, that the number of transacting stakeholders is unaffected by the firm's disclosure quantity (q): $N(q) = N$. That is, a firm's additional disclosures do not attract new stakeholders (along the extensive margin). Our evidence in Table 5 supports this simplifying assumption. We further assume that the (average) marginal benefit of disclosure per transacting stakeholder ($\overline{p}(q)$) is independent of the firm's disclosure quantity (q): $\overline{p}(q) = \overline{p}$. Given these simplifying assumptions, the firm's marginal benefit per disclosure quantity is given by: $N\overline{p}$.

We assume that the firm's cost of disclosure is given by the following cost function:

$$C(q) = \frac{1}{2}cq^2 + f,$$

where $\frac{1}{2}cq$ is the variable cost per disclosure (following the standard quadratic marginal cost function) and f is the fixed cost of disclosure. Given these parameterizations, the firm's net benefit of public disclosure is given by:

$$\pi(q) = N\overline{p}q - \frac{1}{2}cq^2 - f.$$

The first order condition yields:

$$\frac{\partial \pi(q)}{\partial q} = 0 \Leftrightarrow N\overline{p} = cq.$$

Hence, the firm's optimal disclosure quantity is:

$$q^* = \frac{N\overline{p}}{c}.$$

The marginal impact of the number of transacting stakeholders on the disclosure quantity is:

$$\frac{\partial q^*}{\partial N} = \frac{\bar{p}}{c} > 0.$$

Notably, the disclosures per marginal stakeholder is constant (i.e., independent of N):

$$\frac{\partial^2 q^*}{\partial N^2} = 0.$$

Thus, the disclosures per marginal stakeholder and the average disclosures per stakeholder are identical:

$$\frac{\partial q^*}{\partial N} = \frac{\bar{p}}{c} = \frac{q^*}{N}.$$

This analysis makes two important points. First, the disclosure/stakeholder multiple can be interpreted as the net benefit per stakeholder, increasing in the (marginal) disclosure benefit ($\bar{p}$) and decreasing in its (marginal) cost (c). Second, the firm's disclosure/stakeholder multiple of larger firms (N_L) corresponds exactly to the disclosure/stakeholder multiple of smaller firms (N_S, where $N_L > N_S$), supporting our use of a common disclosure/click multiple. Although this exact result is derived under admittedly strong and stylized assumptions, it illustrates the analytically founded idea of our approach and identifies the relevant assumptions.

Example 2: Decreasing marginal benefit, constant marginal costs

In the second example, we again assume that the number of transacting stakeholders is unaffected by the firm's disclosure quantity (q): $N(q) = N$. In contrast to our first example, however, we now assume that there are diminishing marginal benefits of disclosure per transacting stakeholder: $\overline{p}(q) = \hat{p}(1 - vq)$, where $\hat{p}$ denotes the average price intercept and v denotes the inverse price elasticity. This is an arguably more realistic assumption than constant marginal benefits of public disclosure per stakeholder.

We further assume the following linear functional form for the cost function:

$$C(q) = cq + f .$$

Given these parameterizations, the firm's net benefit of disclosure is given by:

$$\pi(q) = N\hat{p}(1 - vq)q - cq - f = N\hat{p}q - N\hat{p}vq^2 - cq - f .$$

The first order condition yields:

$$\frac{\partial \pi(q)}{\partial q} = 0 \Leftrightarrow N\hat{p} - 2N\hat{p}vq = c .$$

Hence, the optimal disclosure quantity is:

$$q^* = \frac{N\hat{p} - c}{2N\hat{p}v} = \frac{1}{2v} - \frac{c}{2N\hat{p}v} .$$

The marginal impact of the number of transacting stakeholders on the disclosure quantity is increasing, as before, and given by:

$$\frac{\partial q^*}{\partial N} = \frac{c}{2N^2\hat{p}v} > 0 .$$

Notably, the marginal impact is decreasing in the number of transacting shareholders:

$$\frac{\partial^2 q^*}{\partial N^2} = -\frac{c}{2N^3 \hat{p}v} < 0 .$$

This means that additional stakeholders increase firms' disclosure quantity, but at a decreasing rate given that additional disclosures' values decline. Notably, this suggests that the marginal impact of a transacting stakeholder is lower than its average impact:

$$\frac{\partial q^*}{\partial N} = \frac{c}{2N^2 \hat{p}v} < \frac{\hat{p} - c}{2N\hat{p}v} = \frac{q^*}{N} .$$

Accordingly, this second example suggests that, given the plausible assumption of diminishing benefits of public disclosure per stakeholder, our common disclosures/click multiple derived from the largest firms, if anything, likely understates the disclosures/click multiple expected for smaller firms. This understatement would work against identifying our hypothesized effect of lower than predicted disclosures/click multiples for unregulated ("small") firms. The understatement may, however, not be too severe given use of average disclosures/click multiples. Deviations in average multiples will be less stark than deviations in marginal disclosures/click multiples as a result of declining marginal disclosure benefits (esp., given the relatively narrow range of number of "clicks" (in contrast to the range in total-asset firm sizes): 8 clicks on average for "small" firms versus 95 clicks on average for "large" firms).

B. Heterogeneity in "small" firms' disclosures in mandatory regime

This section contains anecdotal evidence of the heterogeneity in "small" firms' disclosure in the mandatory regime. Specifically, we present three different filings by "small" firms, illustrating their distinct disclosure choices. The filing in Example 1 merely provides the minimum level of information required by the regulation, whereas the filing in Example 2 voluntarily provides a finer level of financial statement disaggregation than required, and the filing in Example 3 voluntarily provides a depreciation schedule). All of the following filings are provided by "small" firms operating in the same industry (manufacturing) and covering the same fiscal year.

Example 1: "Small" firm providing minimum disclosures

This firm provides disclosures in the mandatory regime which do not exceed the minimum requirements.

Name	Bereich	Information	V.-Datum
SEMO Maschinenbau GmbH Bobingen	Rechnungslegung/ Finanzberichte	Jahresabschluss zum Geschäftsjahr vom 01.01.2016 bis zum 31.12.2016	23.01.2018

SEMO Maschinenbau GmbH

Bobingen

Jahresabschluss zum Geschäftsjahr vom 01.01.2016 bis zum 31.12.2016

Bilanz

Aktiva

	31.12.2016 EUR	31.12.2015 EUR
A. Anlagevermögen	3.796,00	3.754,00
I. Sachanlagen	3.796,00	3.754,00
B. Umlaufvermögen	187.235,47	859.536,03
I. Vorräte	0,00	252.600,00
II. Forderungen und sonstige Vermögensgegenstände	49.003,92	504.833,98
III. Kassenbestand, Bundesbankguthaben, Guthaben bei Kreditinstituten und Schecks	138.231,55	102.102,05
Bilanzsumme, Summe Aktiva	191.031,47	863.290,03

Passiva

	31.12.2016 EUR	31.12.2015 EUR
A. Eigenkapital	43.802,87	40.044,28
I. gezeichnetes Kapital	25.500,00	25.500,00
II. Gewinnrücklagen	4.148,14	4.148,14
III. Gewinnvortrag	10.396,14	5.086,20
IV. Jahresüberschuss	3.758,59	5.309,94
B. Rückstellungen	39.938,00	6.610,00
C. Verbindlichkeiten	107.290,60	816.635,75
Bilanzsumme, Summe Passiva	191.031,47	863.290,03

Anhang 2016

Allgemeine Angaben

Der Jahresabschluss der SEMO Maschinenbau GmbH wurde auf der Grundlage der Rechnungslegungsvorschriften des Handelsgesetzbuchs aufgestellt.

Ergänzend zu diesen Vorschriften waren die Regelungen des GmbH-Gesetzes zu beachten.

Nach den in § 267 HGB angegebenen Größenklassen ist die Gesellschaft eine kleine Kapitalgesellschaft.

Bilanzierungs- und Bewertungsgrundsätze

Forderungen und Wertpapiere wurden unter Berücksichtigung aller erkennbaren Risiken bewertet.

Die Steuerrückstellungen beinhalten die das Geschäftsjahr betreffenden, noch nicht veranlagten Steuern.

Die sonstigen Rückstellungen wurden für alle weiteren ungewissen Verbindlichkeiten gebildet. Dabei wurden alle erkennbaren Risiken berücksichtigt.

Verbindlichkeiten wurden zum Rückzahlungsbetrag angesetzt. Sofern die Tageswerte über den Rückzahlungsbeträgen lagen, wurden die Verbindlichkeiten zum höheren Tageswert angesetzt.

Ergebnisverwendung

Die Geschäftsführung schlägt in Übereinstimmung mit dem Gesellschafter folgende Ergebnisverwendung vor:

Der Jahresüberschuss beträgt € 3.758,59.

Der Restbetrag wird auf neue Rechnung vorgetragen.

Ein Beschluss hierzu wird auf einer gesonderten Gesellschafterversammlung gefasst.

Sonstige Pflichtangaben

Geschäftsführer in 2015: Patrick Hirschek

Forderungen (+) und Verbindlichkeiten (-) gegenüber Gesellschaftern bestehen nicht.

sonstige Berichtsbestandteile

Bobingen, den 08.09.2017

Patrick Hirschek

Angaben zur Feststellung:

Der Jahresabschluss wurde am 08.09.2017 festgestellt.

Example 2: "Small" firm providing additional disclosures (disaggregation)

This "small" firm provides a finer disaggregation in its balance sheet and more extensive notes, including, e.g., further information on the nature and maturity of its liabilities, than required.

Name	Bereich	Information	V.-Datum
PMS Polygraphischer Maschinenbau Schkeuditz GmbH Schkeuditz	Rechnungslegung/ Finanzberichte	Jahresabschluss zum Geschäftsjahr vom 01.01.2016 bis zum 31.12.2016	26.01.2018

PMS Polygraphischer Maschinenbau Schkeuditz GmbH

Schkeuditz

Jahresabschluss zum Geschäftsjahr vom 01.01.2016 bis zum 31.12.2016

Bilanz

Aktiva

	31.12.2016 EUR	31.12.2015 EUR
A. Anlagevermögen	2.662.343,72	2.810.676,72
I. Immaterielle Vermögensgegenstände	1.020,00	133,00
II. Sachanlagen	2.661.323,72	2.810.543,72
B. Umlaufvermögen	734.484,20	915.882,36
I. Vorräte	378.659,58	360.404,27
II. Forderungen und sonstige Vermögensgegenstände	167.530,62	153.695,29
III. Kassenbestand, Bundesbankguthaben, Guthaben bei Kreditinstituten und Schecks	188.294,00	401.782,80
C. Rechnungsabgrenzungsposten	9.273,65	24.736,13
Bilanzsumme, Summe Aktiva	3.406.101,57	3.751.295,21

Passiva

	31.12.2016 EUR	31.12.2015 EUR
A. Eigenkapital	1.328.816,48	1.492.282,63
I. gezeichnetes Kapital	64.000,00	64.000,00
1. Eigene Anteile - offen vom Gezeichneten Kapital abgesetzt	-25.500,00	-25.500,00
2. eingefordertes Kapital	38.500,00	38.500,00
II. Kapitalrücklage	367.223,22	367.223,22
III. Gewinnrücklagen	25.500,00	25.500,00
IV. Gewinnvortrag	34.918,72	34.918,72
V. Bilanzgewinn	862.674,54	1.026.140,69
B. Sonderposten mit Rücklageanteil	693.378,00	731.310,00
C. Rückstellungen	104.501,35	97.649,01
D. Verbindlichkeiten	1.279.405,74	1.430.053,57
Bilanzsumme, Summe Passiva	3.406.101,57	3.751.295,21

Anhang

1. Allgemeine Angaben

Der Jahresabschluss der Gesellschaft für das Geschäftsjahr 2016 wurde auf Grundlage der Rechnungslegungsvorschriften des Handelsgesetzbuches unter Berücksichtigung der Regelungen des BilMoG aufgestellt. Ergänzend hierzu wurden die Regelungen des GmbH-Gesetzes beachtet.

Angaben, die wahlweise in der Bilanz gemacht werden können, sind insgesamt in der Bilanz oder im Anhang aufgeführt.

Für die Gewinn- und Verlustrechnung wurde das Gesamtkostenverfahren angewendet.

Nach den in § 267 HGB angegebenen Größenklassen ist die Gesellschaft eine kleine Kapitalgesellschaft, für die keine Prüfungspflicht gem. § 316 HGB besteht.

Größenklassenabhängige Erleichterungen gem. § 276 HGB wurden in Anspruch genommen.

2. Bilanzierungs- und Bewertungsmethoden

Die Bilanzierung und Bewertung der Vermögensgegenstände und Schulden ist nach den handelsrechtlichen Vorschriften unter Berücksichtigung der durch das BilMoG zulässigen Bewertungsvorschriften vorgenommen worden.

Neben den Rechnungslegungsvorschriften des HGB waren ergänzend die Regelungen des GmbH-Gesetzes zu beachten.

Durch Beachtung des Niederstwertprinzips wird dem Grundsatz der verlustfreien Bewertung Rechnung getragen.

Die Rückstellungen enthalten alle weiteren ungewissen Verbindlichkeiten mit deren Inanspruchnahme zum Tag der Bilanzerstellung zum überwiegenden Teil gerechnet werden muss.

Die Beurteilung der Rückstellung erfolgte nach vernünftiger kaufmännischer Beurteilung. Bei den Rückstellungen wurden künftige Preis- und Kostensteigerungen berücksichtigt.

3. Erläuterungen zur Bilanz

Forderungen und sonstige Vermögensgegenstände

Forderungen gegenüber Gesellschaftern bestanden zum 31.12.2016 nicht. Die Forderungen und sonstigen Vermögensgegenstände haben eine Restlaufzeit von weniger als einem Jahr.

Eigenkapital

Das verwendbare Eigenkapital setzt sich zum 31.12.2016 wie folgt zusammen:

Kapitalrücklage	367.223,22 €
andere Gewinnrücklagen	25.500,00 €
Vortrag auf neue Rechnung	862.674,54 €
	1.255.397,76 €

Verbindlichkeiten

Art der Verbindlichkeiten	Summe	Laufzeit bis 1 Jahr	Laufzeit 1 - 5 Jahre	Laufzeit über 5 Jahre
gg. Kreditinstituten	0,00 €	0,00 €	0,00 €	0,00 €
aus Lieferungen u. Leistungen	129.997,28 €	129.997,28 €	0,00 €	0,00 €
Sonstige Verbindlichkeiten	1.149.408,46 €	84.929,82 €	0,00 €	1.064.478,64 €
	1.279.405,74 €	214.927,10 €	0,00 €	1.064.478,64 €

Verbindlichkeiten gg. Gesellschaftern waren zum 31.12.2016 i. H. v. 547.249,83 € vorhanden.

4. Haftungsverhältnisse und sonstige finanzielle Verpflichtungen

Sonstige, nicht aus der Bilanz ersichtliche finanzielle Verpflichtungen bestehen nicht.

5. Sonstige Pflichtangaben

I. Mitglieder der Geschäftsleitung

Die Geschäfte des Unternehmens wurden durch folgende Person geführt:

Geschäftsführer: Herr Dirk Bahr

II. Ergebnisverwendung

Die Geschäftsleitung schlägt der Gesellschafterversammlung vor, den Jahresüberschuss mit dem Bilanzgewinn zu verrechnen und auf neue Rechnungen vorzutragen.

Schkeuditz/ Freiroda, den 22. Dezember 2017

gez. Dirk Bahr
Geschäftsführer

sonstige Berichtsbestandteile

Angaben zur Feststellung:
Der Jahresabschluss wurde am 12.12.2017 festgestellt.

Example 3: "Small" firm providing additional disclosures (depreciation schedule)

This "small" firm provides additional disclosures in its notes, including a detailed depreciation schedule.

Name	Bereich	Information	V.-Datum
IMAS Startanlagen und Maschinenbau GmbH Brandenburg an der Havel	Rechnungslegung/ Finanzberichte	Jahresabschluss zum Geschäftsjahr vom 01.01.2016 bis zum 31.12.2016	**26.01.2018**

IMAS Startanlagen und Maschinenbau GmbH

Brandenburg an der Havel

Jahresabschluss zum Geschäftsjahr vom 01.01.2016 bis zum 31.12.2016

Bilanz

Aktiva

	31.12.2016 EUR	31.12.2015 EUR
A. Anlagevermögen	234.794,00	307.020,00
I. Sachanlagen	234.794,00	307.020,00
B. Umlaufvermögen	325.855,84	515.842,27
I. Vorräte	42.729,58	89.281,00
II. Forderungen und sonstige Vermögensgegenstände	74.062,62	71.099,51
III. Kassenbestand, Bundesbankguthaben, Guthaben bei Kreditinstituten und Schecks	209.063,64	355.461,76
C. Rechnungsabgrenzungsposten	4.731,31	3.763,26
Bilanzsumme, Summe Aktiva	565.381,15	826.625,53

Passiva

	31.12.2016 EUR	31.12.2015 EUR
A. Eigenkapital	405.457,33	459.782,97
I. gezeichnetes Kapital	25.000,00	25.000,00
1. nicht eingeforderte ausstehende Einlagen	-12.500,00	-12.500,00
2. eingefordertes Kapital	12.500,00	12.500,00
II. Kapitalrücklage	80.000,00	0,00
III. Gewinnvortrag	312.957,33	447.282,97
B. Rückstellungen	19.892,00	85.603,00
C. Verbindlichkeiten	140.031,82	281.239,56
Bilanzsumme, Summe Passiva	565.381,15	826.625,53

Anhang

Allgemeine Angaben zum Jahresabschluss

Auf Grund der erstmaligen Anwendung des Bilanzrichtlinie-Umsetzungsgesetzes (BilRUG) wurde auch der Vorjahreswert der Umsatzerlöse angepasst, ein Vergleich mit dem Jahresabschluss des Vorjahres ist damit nicht möglich.

Angaben zur Identifikation der Gesellschaft laut Registergericht

Firmenname laut Registergericht: IMAS Startanlagen und Maschinenbau GmbH

Firmensitz laut Registergericht: Brandenburg an der Havel

Registereintrag: Handelsregister

Registergericht: Potsdam

Register-Nr.: 18328

Angaben zu Bilanzierungs- und Bewertungsmethoden

Bilanzierungs- und Bewertungsgrundsätze

Erworbene immaterielle Anlagewerte wurden zu Anschaffungskosten angesetzt und, sofern sie der Abnutzung unterlagen, um planmäßige Abschreibungen vermindert.

Das Sachanlagevermögen wurde zu Anschaffungs- bzw. Herstellungskosten angesetzt und, soweit abnutzbar, um planmäßige Abschreibungen vermindert.

In die Herstellungskosten wurden neben den unmittelbar zurechenbaren Kosten auch notwendige Gemeinkosten und durch die Fertigung veranlasste Abschreibungen einbezogen.

Die planmäßigen Abschreibungen wurden nach der voraussichtlichen Nutzungsdauer der Vermögensgegenstände linear und degressiv vorgenommen.

Der Übergang von der degressiven zur linearen Abschreibung erfolgt in den Fällen, in denen dies zu einer höheren Jahresabschreibung führt.

Die Vorräte wurden zu Anschaffungs- bzw. Herstellungskosten angesetzt. Sofern die Tageswerte am Bilanzstichtag niedriger waren, wurden diese angesetzt.

Forderungen und Wertpapiere wurden unter Berücksichtigung aller erkennbaren Risiken bewertet.

Die sonstigen Rückstellungen wurden für alle weiteren ungewissen Verbindlichkeiten gebildet. Dabei wurden alle erkennbaren Risiken berücksichtigt.

Verbindlichkeiten wurden zum Erfüllungsbetrag angesetzt.

Gegenüber dem Vorjahr abweichende Bilanzierungs- und Bewertungsmethoden

Beim Jahresabschluss konnten die bisher angewandten Bilanzierungs- und Bewertungsmethoden im Wesentlichen übernommen werden.

Ein grundlegender Wechsel von Bilanzierungs- und Bewertungsmethoden gegenüber dem Vorjahr fand nicht statt.

Angaben zur Bilanz

Angabe zu Restlaufzeitvermerken

Der Betrag der Verbindlichkeiten mit einer Restlaufzeit bis zu einem Jahr beträgt EUR 110.387,96 (Vorjahr: EUR 252.937,74).

Der Betrag der Verbindlichkeiten mit einer Restlaufzeit größer einem Jahr beträgt EUR 29.643,86 (Vorjahr: EUR 28.301,82).

Angaben zu Verbindlichkeiten gegenüber Gesellschaftern

Der Betrag der Verbindlichkeiten gegenüber Gesellschaftern beläuft sich auf EUR 68.869,72 (Vorjahr: EUR 9.053,72).

Sonstige Angaben

Durchschnittliche Zahl der während des Geschäftsjahrs beschäftigten Arbeitnehmer

Die durchschnittliche Zahl der während des Geschäftsjahres im Unternehmen beschäftigten Arbeitnehmer betrug 7.

Unterschrift der Geschäftsführung

Brandenburg, den 27.12.2017

gez. Volkmar Franz, Geschäftsführer

Anlagespiegel

	Anschaffungs-, Herstellungskosten 01.01.2016 EUR	Zugänge EUR	Abgänge EUR	Abschreibungen Geschäftsjahr EUR	Abgänge EUR	Buchwert 31.12.2016 EUR
Anlagevermögen						
Sachanlagen						
Grundstücke, grundstücksgleiche Rechte und Bauten einschließlich der Bauten auf fremden Grundstücken	187.699,19	0,00	0,00	5.634,00	0,00	144.035,00
andere Anlagen, Betriebs- und Geschäftsausstattung	330.452,56	7.877,74	50.061,87	40.584,74	16.176,87	90.759,00
Summe Sachanlagen	518.151,75	7.877,74	50.061,87	46.218,74	16.176,87	234.794,00
Summe Anlagevermögen	518.151,75	7.877,74	50.061,87	46.218,74	16.176,87	234.794,00

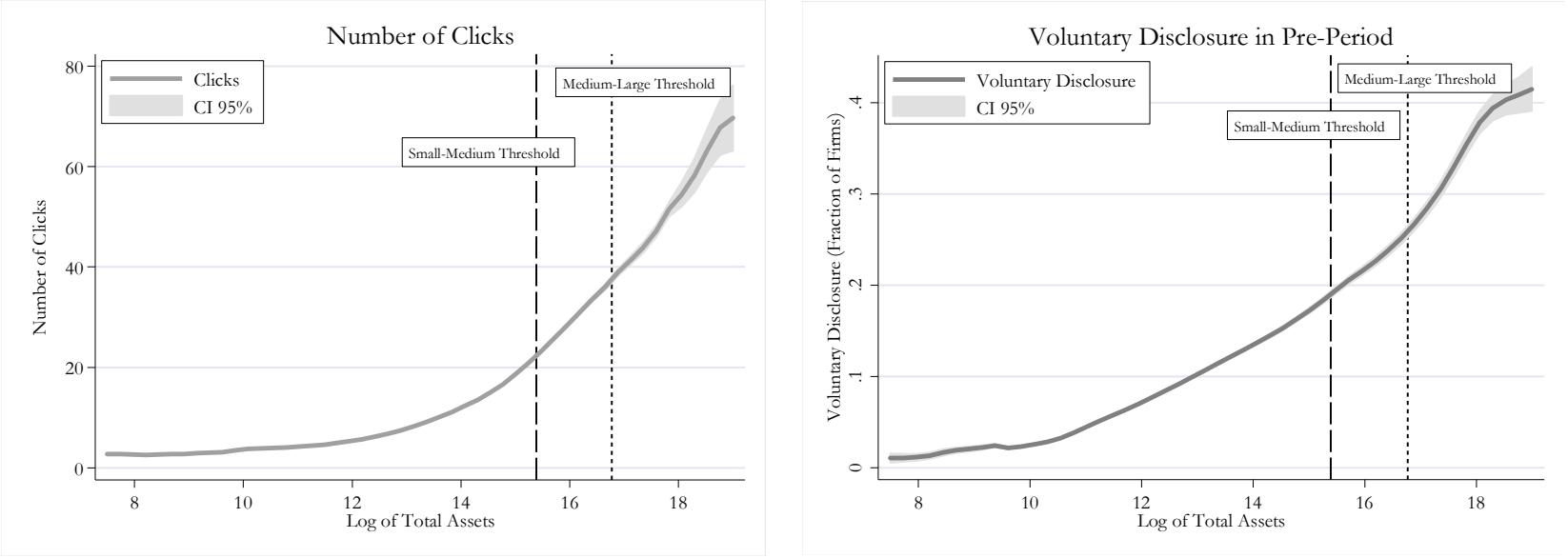
sonstige Berichtsbestandteile

Angaben zur Feststellung:

Der Jahresabschluss wurde am 27.12.2017 festgestellt.

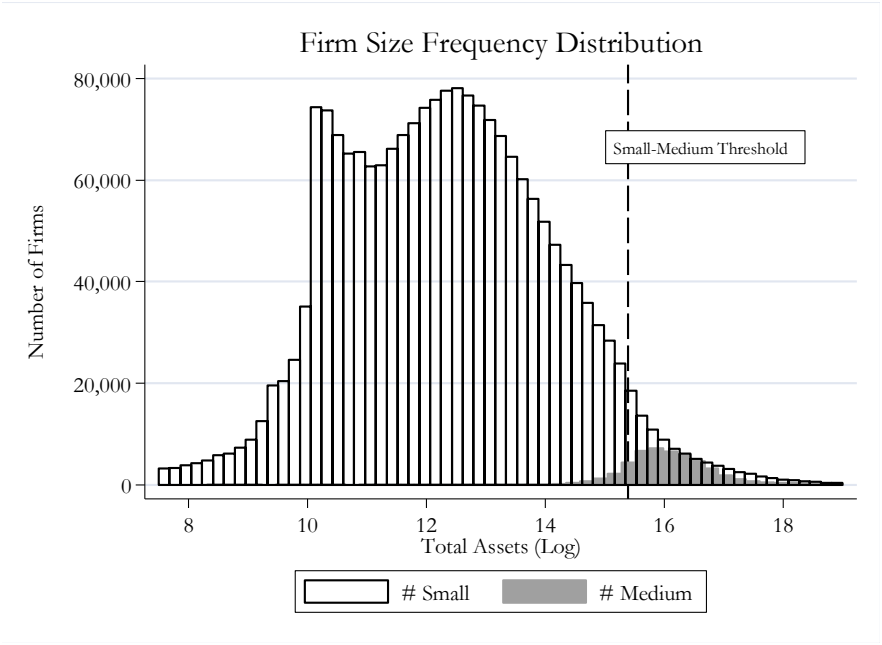
Figure A.1

Panel A **Panel B**



This figure compares our disclosure demand measure (Panel A) to firms' voluntary disclosure of their financial statements during a low-enforcement period pre-dating our sample period (Panel B). Disclosure demand is measured by the number of online views a filing receives on the official publication platform twelve months after its publication. We identify voluntary disclosure of financial statements in the low enforcement period based on whether or not annual financial information as of fiscal year-end 2004 is available in Bureau van Dijk's *dafne* database (as of 2013). The lines present local averages of the number of online views (Panel B) and the fraction of firms disclosing financial statements (Panel B) conditional on firm size calculated using a Kernel regression with an Epanechnikov kernel to weigh local observation. The shaded gray areas present 95% confidence bands. The vertical lines present the total asset values based on which the disclosure regulation classifies firms as "small", "medium", or "large" (see Table A.1 in the online appendix for details).

Figure A.2



This figure shows the number of "small" and "medium" firms around the small-medium threshold. The sample is the one used for our main tests (Figures 3-6; for descriptive statistics, refer to Table 2). The transparent (gray) bars show the number of firms in the "small" ("medium") regulatory size category. The dashed vertical line represents the total asset threshold.

Table A.1

Regulatory Size Thresholds and Mandatory Public Disclosure

Panel A: Thresholds implemented in German company law

Fiscal Year	Classification	Total Assets (million EUR)	Sales (million EUR)	Employees	Statutory Source
Since 2008	*Small*	$X \leq 4.84$	$X \leq 9{,}68$	$X \leq 50$	s. 267 German Commercial Code
	Medium	$4.84 < X \leq 19.25$	$9{,}68 < X \leq 38.5$	$50 < X \leq 250$	
	Large	$X > 19.25$	$X > 38.5$	$X > 250$	
Since 2012	*Micro*	$X<0.35$	$X<0.7$	$X<10$	s. 267a German Commercial Code

Panel B: Reporting requirements

	Balance sheet	Income statement	Notes	Management Report	Audit
Small	Abbreviated (22)	None	Major exemptions	No	No
Medium	Condensed (39)	Condensed (20/25)	Minor exemptions	Yes	Yes, by chartered bookkeeper
Large	Full (63)	Full (27/31)	Full	Yes	Yes, by statutory auditor
Micro	Abbreviated (10)	None	None	No	No

This table summarizes the regulatory size thresholds and associated mandatory disclosure requirements. Panel A of this table presents the threshold values for the assignment into one of the three regulatory size categories as implemented in Germany during our sample period. A firm is classified as medium-sized or large if it exceeds the thresholds of any two of the three size criteria in two consecutive years. Panel B of this table displays the differential reporting requirements applying to the three regulatory size categories. The numbers in brackets in the balance sheet and income statement column refer to minimum number of single-line items that need to be disclosed. For medium-sized and large firms, the number of positions in the income statement reflect the number of positions required under function of expense and nature of expense method, respectively.

Table A.2

Disclosure of Financial Statements in Pre-Enforcement Period and Disclosures in the Mandatory Regime

	Disclosure in Mandatory Regime (Log)	
	Small	Medium
Pre-Enforcement Disclosure	0.158***	0.039***
	(0.018)	(0.012)
Size, Age, Legal Form Controls	Yes	Yes
County-Industry FE	Yes	Yes
Observations	27,760	8,258
# Clusters	390	332
Adjusted R-Squared	0.279	0.335

This table shows presents evidence on the relation between firms' de fact voluntary disclosure of financial statements prior to our sample period and their disclosures in the mandatory regime. Prior to fiscal year 2006, the disclosure requirements were not strictly enforced in Germany, rendering disclosure of financial statements de facto voluntary. *Pre-Enforcement Disclosure* is an indicator variable equal to one if financial information is available for the firm for fiscal year 2004 in Bureau van Dijk's *dafne* database, and zero otherwise. We define the indicator for all firms in our cross-sectional sample (Table 3) which disclose once the strict enforcement starts (i.e., firms with financial information available for fiscal year 2006). The dependent variable is firms' disclosure observed in the mandatory regime, measured by the natural logarithm of their number of characters. All specifications include county-industry-year fixed effects and legal form fixed effects. We further include (log-)linear size controls for total assets, sales, employees, and age. We report standard errors clustered by county in parentheses. *, **, and *** denote statistical significance levels below 10%, 5%, and 1%, respectively.

Table A.3

Firms' Disclosure, Clicks, and Disclosure/Click Multiple in the Mandatory Regime

Panel A: Small, Medium, and Large Firms

	Disclosure in Mandatory Regime	Clicks	Disclosure/Click in Mandatory Regime
	(1)	(2)	(3)
Total Assets (Log)	0.247***	0.234***	-0.157***
	(0.003)	(0.005)	(0.009)
Legal Form Controls	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes
Observations	1,662,668	1,662,668	1,662,668
# Clusters	399	399	399
R-Squared (Within)	0.061	0.055	0.025

Panel B: Medium and Large Firms

	Disclosure in Mandatory Regime	Clicks	Disclosure/Click in Mandatory Regime
	(1)	(2)	(3)
Total Assets (Log)	0.323***	0.210***	-0.029
	(0.011)	(0.011)	(0.015)
Legal Form Controls	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes
Observations	49,906	49,906	49,906
# Clusters	396	396	396
R-Squared (Within)	0.105	0.044	0.001

Panel C: Large Firms

	Disclosure in Mandatory Regime	Clicks	Disclosure/Click in Mandatory Regime
	(1)	(2)	(3)
Total Assets (Log)	0.395***	0.257***	-0.100***
	(0.020)	(0.024)	(0.024)
Legal Form Controls	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes
Observations	7,470	7,470	7,470
# Clusters	302	302	302
R-Squared (Within)	0.156	0.066	0.010

This table presents evidence on the relation between firms' disclosure observed in the mandatory regime, clicks, disclosures-per-click and firm size. Disclosure/click in the mandatory regime is the number of characters observed in firms' filings divided by the number of clicks on the filing. Total Assets (Log) is a proxy for firms' sizes calculated as the natural logarithm of firms' total assets. In Panel A, we estimate the relation between disclosures, clicks, disclosures-per-click and firm size for the entire sample of firms, including firms in the "small," "medium," and "large" regulatory size category. In Panel B, we estimate the relation between disclosures, clicks, disclosures-per-click and firm size only for firms in the "medium" and "large" regulatory

size category. In Panel C, we estimate the relation between disclosures, clicks, disclosures-per-click and firm size only for firms in the "large" regulatory size category. All specifications include county-industry-year fixed effects and legal form fixed effects. We report standardized coefficients, within-R-squared values (purged of variation explained by fixed effects), and standard errors clustered by county in parentheses. *, **, and *** denote statistical significance levels below 10%, 5%, and 1%, respectively.

Our preferred specification is shown in Panel B. The exclusion of "small" firms is warranted as the smallest firms' disclosures in the mandatory regime are strongly pushed above their disclosures in the voluntary regime. Accordingly, their inclusion strongly biases toward a negative correlation between firms' disclosures/click multiples (observed in the mandatory regime) and firm size. This negative correlation, however, is induced by the mandate. Thus, it is not representative of the relation between disclosures-per-click and firm size in a voluntary regime (which we are actually interest in and essentially assume to be flat). The results in Panel B suggest that firm size does not explain much of the variation in the disclosures/click multiple and does not appear to be strongly positively or negatively related to the disclosures/click multiple. The results in Panel C provide comparable inferences with respect to the explanatory power of firm sizes for the variation in disclosures/click multiples. The relation between disclosures/click multiples and firm size, however, is significantly negative for this subsample of firms. This estimate may hint at diminishing returns to scale (clicks), especially given the extensive range of firm sizes covered by the large firms. This estimate may, however, also be driven by few outliers (given the lower sample size, the extensive size range, and the low explanatory power of the linear fit).

Table A.4

Firms' Disclosure and Strength of Information Spillovers: Alternative Specifications

Panel A: Firms' Disclosures and Number of Peers

	Abnormal Disclosure		Disclosure in Mandatory Regime		Publication Lag		Voluntary Sales Disclosure	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Small	-0.767***	-0.626***	-1.058***	-1.051***	-0.081***	0.044*	0.269***	-0.028
	(0.072)	(0.239)	(0.032)	(0.074)	(0.014)	(0.024)	(0.031)	(0.032)
Small * Number of Peers	-0.053***		-0.013**		0.006***		-0.028***	
	(0.012)		(0.005)		(0.002)		(0.007)	
Small * Number of Peers		-0.060*		-0.010		-0.012***		0.021***
		(0.032)		(0.009)		(0.003)		(0.004)
Regulatory Size Classes of Peers	All	Medium	All	Medium	All	Medium	All	Medium
Peer Group	County-Industry-Year	Industry-Year	County-Industry-Year	Industry-Year	County-Industry-Year	Industry-Year	County-Industry-Year	Industry-Year
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,466	54,466	54,466	54,466	284,265	284,265	637,651	637,651
# Clusters	396	396	396	396	398	398	398	398

Panel B: Firms' Disclosures and Peer Information Environment

	Abnormal Disclosure				Disclosure in Mandatory Regime			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Small	-0.935***	-0.767***	1.039***	-0.884***	-1.129***	-1.096***	0.384*	-1.041***
	(0.049)	(0.050)	(0.304)	(0.069)	(0.016)	(0.017)	(0.223)	(0.028)
Small * Abnormal Disclosure	-0.239***				-0.001			
	(0.049)				(0.016)			
Small * Abnormal Disclosure		-0.449***				-0.049***		
		(0.033)				(0.010)		
Small * Total Disclosure			-0.144***				-0.102***	
			(0.022)				(0.016)	
Small * Sales Disclosure				-0.040***				-0.019***
				(0.013)				(0.005)
Regulatory Size Classes of Peers	Medium	Medium / Large	All	All	Medium	Medium / Large	All	All
Peer Group	Industry-Year	County-Industry-Year	County-Industry-Year	County-Industry-Year	Industry-Year	County-Industry-Year	County-Industry-Year	County-Industry-Year
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,466	54,466	54,466	54,466	54,466	54,466	54,466	54,466
# Clusters	396	396	396	396	396	396	396	396
Adjusted R-Squared	0.195	0.198	0.196	0.194	0.793	0.793	0.803	0.793

Panel C: Firms' Disclosures and Peer Information Environment - Additional Disclosure Outcomes

	Publication Lag				Voluntary Sales Disclosure			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Small	-0.066***	-0.054***	-0.248***	-0.071***	0.246***	0.229***	0.782***	0.104***
	(0.011)	(0.010)	(0.040)	(0.013)	(0.022)	(0.020)	(0.105)	(0.028)
Small * Abnormal Disclosure	0.034***				-0.140***			
	(0.008)				(0.013)			
Small * Abnormal Disclosure		0.009*				-0.101***		
		(0.005)				(0.009)		
Small * Total Disclosure			0.014***				-0.047***	
			(0.003)				(0.008)	
Small * Sales Disclosure				0.006**				-0.002
				(0.003)				(0.009)
Regulatory Size Classes of Peers	Medium	Medium / Large	All	All	Medium	Medium / Large	All	All
Peer Group	Industry-Year	County-Industry-Year	County-Industry-Year	County-Industry-Year	Industry-Year	County-Industry-Year	County-Industry-Year	County-Industry-Year
Size, Age, Legal Form Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,466	54,466	284,265	284,265	139,464	139,464	637,651	637,651
# Clusters	396	396	398	398	398	398	398	398
Adjusted R-Squared	0.174	0.174	0.101	0.101	0.119	0.12	0.128	0.294

This table presents evidence on the cross-sectional variation in firms' disclosure with respect to the strength of the information spillover using alternative specifications of our cross-sectional variables. Our dependent variables are *Abnormal Disclosure* (measured by the difference between the logarithm of firms' number of characters observed in the mandatory regime less the logarithm of firms' number of characters predicted for the voluntary regime), *Disclosure in Mandatory Regime* (measured by the logarithm of firms' number of characters observed in the mandatory regime), *Publication Lag* (measured by the log of the number of days between fiscal year-end and publication dated), and *Voluntary Sales Disclosure* (an indicator taking the value of one if a firm voluntarily discloses sales information, and zero otherwise). In Panel A, we explore the relation between our disclosure outcomes and different measures of firms' number of peers. In Columns (1), (3), (5), and (7), # *of Peers* is measured by the number of all firms ("small", "medium", and "large") operating in the same county-industry-year. In Columns (2), (4), (6), and (8), # *of Peers* is measured by the number of "medium" firms operating in the same industry-year. In Panels B and C, we explore the relation between our disclosure outcomes and different measures of peers' aggregated disclosures. In Columns (1) and (5), *Abnormal Disclosure* is the total abnormal disclosures provided by "medium" peers operating in the same industry-year. In Columns (2) and (6), *Abnormal Disclosure* is the total abnormal disclosures provided by "medium" and "large" peers operating in the same county-industry-year. In Columns (3) and (7), *Total Disclosure* is the total disclosure (i.e., logarithm of characters observed in the mandatory regime) provided by all peers in the same county-industry-year. In Columns (4) and (8), *Sales Disclosure* is the total number of firms providing sales disclosures and operating in the same county-industry-year. All specifications include county-industry-year fixed effects and legal form fixed effects. We further include a control function including all three regulatory size criteria (total assets, sales, employees) and age.

When we use firms' voluntary disclosures of sales as dependent variable, drop sales from our control function (i.e., in Columns (7) – (8) of Panel A and Columns (6) – (10) of Panel C). We report standard errors clustered by county in parentheses. *, **, and *** denote statistical significance levels below 10%, 5%, and 1%, respectively.