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Disclosure regulation: Past, present, and future

S.P. KOTHARI

Liandong ZHANG
Singapore Management University, ldzhang@smu.edu.sg

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S.P. Kothari
Massachusetts Institute of Technology

Liandong Zhang
Singapore Management University

Luo Zuo
Cornell University

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Abstract

This monograph provides an overview of the theories of disclosure regulation and recent developments in the disclosure regulation literature. We organize our discussion around three basic questions. First, why do we need to regulate corporate disclosure in the financial market? Second, which theories explain the current state of disclosure regulation? Third, what are the economic consequences of disclosure regulation? In exploring the third question, we discuss several examples of disclosure regulation related to information production, dissemination, and presentation. Then, we provide an overview of the current debate on mandating environmental, social and governance (ESG) disclosure and reporting. Finally, we conclude by discussing emerging issues of disclosure regulation and potential avenues for future research.

Keywords: Regulation, corporate disclosure, financial reporting, capital market, political economy, information asymmetry.

JEL Classification: D78, D82, G14, G18, G38, K22, K42, M14, M48, Q56.

1. Introduction

This monograph provides an overview of the theories of financial market regulation, with a focus on corporate disclosures and financial reporting. In a market economy, financial markets play a central role in allocating economic resources, and financial reporting and disclosure are critical to the efficient operation of the financial market. Therefore, the regulation of financial reporting and disclosure is the cornerstone of financial market regulation that potentially shapes financial market efficiency, which in turn, affects real economic efficiency and welfare.

In our description of the key issues of disclosure and reporting regulation, we discuss selected academic research to illustrate the key points and recent developments. However, this monograph is not a comprehensive review of the academic literature on disclosure regulation. We direct interested readers to Healy and Palepu (2001), Kothari, Ramanna, and Skinner (2010), and Leuz and Wysocki (2016) for extensive reviews of the literature.

1.1. What is corporate disclosure regulation?

Broadly defined, disclosure regulation creates and implements disclosure and reporting rules imposed by an authority, i.e., a government, legislature, or regulatory agency like the Securities and Exchange Commission (SEC) in the United States. This definition is consistent with recent work in the accounting literature. For example, Leuz and Wysocki (2016, p. 527) define disclosure regulation as including "a central authority formally creating and interpreting disclosure and reporting rules, monitoring compliance with these rules, and enforcing and imposing penalties for deviation from the rules."

Typically, governments delegate the responsibility of creating and enforcing disclosure rules to certain agencies. For example, in the United States, the SEC is the primary government agency that sets and enforces rules stipulating what information to disclose, when to disclose it, and how to

disclose it. In some countries, such as Singapore, the government delegates the major role of disclosure regulation to stock exchanges.

1.2. A brief history of U.S. disclosure regulation

The 1929 stock market crash, which resulted in steep investor losses, prompted the U.S. Congress to focus on the role of corporate disclosures in the efficient pricing of securities. Prior to the establishment of the SEC in 1934, the New York Stock Exchange (NYSE) had already started in 1930 to consult the American Institute of Accountants (AIA, forerunner of the American Institute of Certified Public Accountants, AICPA) about its requirements on listed firms' financial statements. In 1934, a blue-ribbon committee of the AIA put forward a set of five broad accounting principles that were "so generally accepted they should be followed by all listed companies" (Carey 1969, p. 177). The AIA approved these principles and added another principle in 1934.

The U.S. Congress passed the Securities Act and the Securities Exchange Act in 1933 and 1934, respectively, and the SEC was created by the latter act. Since then, the SEC has delegated the responsibility of formulating Generally Accepted Accounting Principles to the Committee on Accounting Procedures (CAP) from 1939 to 1959, to the Accounting Principles Board (APB) from 1959 to 1973, and to the Financial Accounting Standards Board (FASB) from 1973 to the present. The Sarbanes–Oxley Act of 2002 led to the creation of the Public Company Accounting Oversight Board (PCAOB) to oversee audit firms and their audits.

The SEC has been administering various statutes, including the Securities Act of 1933, the Securities Exchange Act of 1934, the Trust Indenture Act of 1939, the Investment Company Act of 1940, the Investment Advisers Act of 1940, the Securities Acts Amendments of 1964 and 1975, the Williams Act of 1968, the Sarbanes–Oxley Act of 2002, the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010, and the Jumpstart Our Business Startups Act of 2012. The SEC's governing statutes establish its authority to make rules that have the force of law within certain limits.

These governing statutes require that the SEC justify its proposed rules as necessary to protect investors and promote efficiency, competition, and capital formation.

For a more comprehensive discussion of securities regulation in the United States, please see Watts and Zuo (2016), Mahoney (2021), and Zeff (2021).

1.3. Organization

The remainder of this monograph is organized as follows. In Section 2, we discuss the theories of disclosure regulation, including the justifications for and the political economy of disclosure regulation. Section 3 presents several examples of disclosure regulation and empirical evidence on economic consequences. Section 4 discusses the current debate on environment, society, and governance (ESG) disclosure regulation. Finally, in Section 5, we conclude by offering some tentative thoughts on emerging issues of disclosure regulation.

2. Theories of Disclosure Regulation

In this section, we discuss (1) potential justifications for disclosure regulation in the financial market and (2) the political economy of disclosure regulation.

2.1. Justifications for disclosure regulation

In this subsection, we first describe the information asymmetry problems in the financial market, which form the basis of potential demands for disclosure regulation. Then, we discuss whether market forces, private contracts and enforcement, and alternative non-regulatory monitoring mechanisms can help solve the information problems. Finally, we discuss disclosure costs and externalities as potential justifications for disclosure regulation.

2.1.1. The information problems

In information economics, the demand for information stems from two major intertwined problems of information asymmetry: adverse selection and moral hazard. Under adverse selection, corporate managers might have better information about firm value than outside investors have. This

constitutes an information advantage for the managers. Armed with this information advantage, self-interested managers have an incentive to inflate the performance and prospects of their firms and thereby maximize their own wealth (via stockholdings, insider trading, etc.). As a result, investors might not be able to tell the difference between good and bad firms. Rational investors therefore would pay the "average" price for all firms. Good firms would then be undervalued and would exit, which means only bad firms would remain. In an extreme case, this "lemons" problem could lead to the collapse of the capital market (Akerlof, 1970; Myers and Majluf, 1984). Such a collapse can be averted if investors receive information that enables them to discriminate between good and bad firms.

The moral hazard problem in the corporate context occurs when corporate managers' actions are unobservable to investors after investors have invested in a firm and the managers have incentives to expropriate the invested funds (Berle and Means, 1932; Jensen and Meckling, 1976). For example, managers might use the proceeds from the sale of equity in a firm to pay themselves excessively, indulge in excessive perquisites and employment benefits (for example, using corporate jets), or overinvest to build a corporate empire. Alternatively, if investors acquire a debt stake in the firm, shareholder-managers can expropriate debt holders by issuing more senior debt or taking excessive risks. These actions are beneficial to managers and harmful to the interests of outside investors. Investors protect themselves against expropriation through contracts and through access to reliable information that helps them monitor the behavior of corporate managers and protect their interests in the firm.

2.1.2. Information production: Market forces, private contracts and enforcement, and non-traditional players

However, even if we recognize the importance of information for a well-functioning capital market, it is not straightforward that mandatory disclosures are necessary or desirable. As noted by an SEC economist, "a common mistake in evaluating the net benefits of a regulation to society is to assume that a state of laissez-faire would arise in the absence of regulation" (Alexander and Lee, 2004).

Instead, even in the absence of government regulation, market forces and private litigation can potentially address the information problems.

In a competitive managerial labor market, a manager's reputation will be damaged and her compensation might decrease if the market discovers that the manager has released incomplete, biased, or false information to the capital market. In addition, the capital market may reward firms that make truthful disclosures with higher share prices and lower cost of financing. These market forces can serve as disciplinary or reward mechanisms that motivate managers to voluntarily disclose information. Moreover, the corporate control market and the product market can also deter managers from taking value-destroying actions (e.g., Gompers, Ishii, and Metrick, 2003; Giroud and Mueller, 2011).

Firms and capital providers frequently enter into private contracts to address the problem of information asymmetry (Coase, 1960; Roberts, 2015; Schoenfeld, 2020). For example, securities issuers offer private contracts to commit to full disclosure and guarantee its accuracy. Private contracts can help achieve an efficient equilibrium as long as the courts can enforce these contracts. Similarly, to address the moral hazard problem, investors and managers can sign shareholder or debt contracts based on observable information and employ information intermediaries such as external auditors to enhance or assure the accuracy of the information used in these contracts.

In addition to market forces and private contracts, recent research suggests that some non-traditional players in the capital market, such as employees, can help alleviate the information asymmetry problems. These players' incentives for monitoring and information production stem from their implicit claims in the firm. They can also be driven by certain monetary or non-monetary rewards. For example, employees have incentives to monitor because their working conditions, job security, and prospects hinge on firms' actions. They are also motivated to blow the whistle when there is a large financial reward for doing so.[1] Moreover, employees' cost of obtaining information might be

[1] https://www.qui-tam-attorney.com/10-largest-qui-tam-whistleblower-rewards.html.

low because such information is often a by-product of their normal work. Dyck, Morse, and Zingales (2010) show that employees play an important role in detecting and revealing corporate fraud. Huang, Li, and Markov (2020) find that employees' predictions of their companies' business outlook from Glassdoor.com are informative in predicting future operating performance.

The media and the short sellers are among other prominent non-traditional players in corporate monitoring and information discovery. The media are motivated to uncover and disseminate newsworthy, often negative information on public firms to increase the circulation and readership of their products or services (Miller, 2006). Using local newspaper closures as an exogenous shock, Heese, Pérez-Cavazos, and Peter (2021) show that the local press is an effective monitor of corporate misconduct. Short sellers also have financial incentives to discover and disseminate negative information about firms (Boehmer, Jones, Wu, and Zhang, 2020). Fang, Huang, and Karpoff (2016) show that (the prospect of) short selling helps curb earnings management, detect fraud, and improve the informativeness of stock prices.

Therefore, for disclosure regulation to be desirable, it should be the case that market forces, private contracts and courts, and various non-traditional players must be unable to fully resolve the information asymmetry problems. Incidents of corporate misreporting and fraud appear to be consistent with the existence of residual information problems in the capital market. For a broader population of U.S. firms, Kothari, Shu, and Wysocki (2009) find that firms on average tend to withhold or delay the disclosure of bad news relative to good news (despite the existing regulatory system).

Market frictions, sometimes introduced by firms themselves, can prevent market forces from eliminating information asymmetry problems. Limited arbitrage in the financial market and the bounded rationality of market participants are examples of frictions that hinder the market's ability to discipline corporate managers and motivate fair and full disclosure. Corporate managers can also adopt various anti-takeover provisions to shield themselves from the discipline of the corporate-control

market. Moreover, Narayanan (1985) and Stein (1989) observe that managers concerned about their labor-market reputation or current share prices might take actions, such as real earnings management, to boost measures of short-term performance at the expense of long-run shareholder value.

In addition, optimal private contracts are difficult to achieve because it is difficult and costly to specify the rights, obligations, and remedies of the contracting parties in every possible state of nature. Worse still, managers can distort the information used in contracts, and the incentive problems of auditors themselves may hinder their ability to ensure reliability (e.g., Ege and Stuber, 2022). Even if a complete contract can be written, enforcement by the courts can be costly, biased, corrupted, or politically motivated (George, 1998; Shleifer, 2012).

The monitoring and information roles of non-traditional monitors are also unlikely to fully address the residual information problems left by market forces and private contracts and enforcement. First, because these players are mostly outsiders, they cannot have access to all information. Second, even if they have information, corporate managers can find ways to increase the cost of information collection and dissemination. For example, recent decades have seen an increase in so-called SLAPP (strategic lawsuit against public participation) lawsuits brought by corporations against the news media, short sellers, and individuals, with the primary purpose of stifling the public dissemination and discussion of negative information about firms (e.g., Lee, Ng, Yoo, and Zhang, 2022).

2.1.3. Costs of disclosures and externalities

Even though market forces, private contracts, and non-traditional players can ensure optimal information production from an individual firm's perspective, there can be an underproduction of information from a society's perspective as disclosure is costly and has externalities. Therefore, the cost-benefit optimal level of disclosure for a firm may not be the cost-benefit optimal level for society.

In Verrecchia's (1983) partial disclosure theory, the cost of disclosure is an important friction to full disclosure. In addition to the direct monetary and time costs (managerial opportunity costs) of

collecting, processing, certifying, and disseminating information, disclosures also carry indirect costs, such as proprietary cost. Proprietary cost of disclosure refers to the concern that a firm's disclosures to the capital market can damage the firm's competitive position in the product market. It is arguably the most important indirect cost of corporate disclosure, and the proprietary cost hypothesis predicts that firms with higher proprietary costs tend to disclose less. However, earlier research on the association between product market competition and disclosure provides largely mixed evidence on the proprietary cost hypothesis (Beyer, Cohen, Lys, and Walther, 2010).

A growing body of recent literature uses quasi-natural experiments and refined proxies of proprietary disclosure (Lang and Sul, 2014) to study the causal effects of proprietary costs on the level of corporate disclosure. For example, Li, Lin, and Zhang (2018) exploit the staggered adoption of the inevitable disclosure doctrine (IDD) as an exogenous shock that increases the proprietary cost of disclosure. They find that firms respond to IDD adoption by reducing the disclosure of major customer identities. Using the Uniform Trade Secrets Act setting, Glaeser (2018) finds that firms that rely more heavily on trade secrecy disclose less proprietary information but more non-proprietary information. However, the total effect of trade secrecy is to decrease corporate transparency. Bernard, Burgstahler, and Kaya (2018) find that private firms manage firm size downward to avoid size-based disclosure requirements, providing evidence on the economic significance of the proprietary cost of financial statement disclosures. Overall, recent literature provides clear evidence of the significance of proprietary cost and its negative effect on information production.

While it is theoretically sound that corporate disclosures have externalities and spillover effects, the evidence on disclosure externalities has been relatively sparse. Nevertheless, it is accumulating (e.g., Badertscher, Shroff, and White, 2013; Bernard, Blackburne, and Thornock, 2020; Breuer, 2021; Durnev and Mangen, 2020; Glaeser and Omartian, 2022; Kim and Valentine, 2021, 2022). For example, Bernard, Blackburne, and Thornock (2020) show that rivals' disclosures help facilitate

investment and product decisions, including acquisition and product differentiation strategies. Kim and Valentine (2021) find an increase in innovations for firms whose rivals reveal more information in patent disclosures and a decrease in innovation for firms whose own disclosures are divulged to competitors, consistent with both positive externalities and proprietary costs of disclosure. Kim and Valentine (2022) find that public firm innovation-relevant disclosures have a positive effect on future patent sales by other parties that consume these disclosures, consistent with financial disclosures generating positive information externalities. Overall, recent studies have provided some initial evidence on the existence of externalities of corporate disclosure.

Since disclosing firms bear all the costs of disclosure but cannot collect revenue from parties that benefit from disclosure externalities (public goods), they tend to disclose less information than the socially optimal level. This information underproduction problem caused by externalities represents another important justification for disclosure regulation.

2.1.4. Summary

Overall, although market forces, private contracts and enforcements, and various other non-regulator stakeholders can help mitigate the information problems in the capital market, they are unlikely to be able to fully resolve the problems. In addition, the public good nature of corporate disclosure combined with its non-trivial costs suggests that the optimal level of disclosure for firms is unlikely to be optimal from a society's perspective. Under these circumstances, disclosure regulation might be justified.

2.2. The political economy of disclosure regulation

Assuming that disclosure regulation is necessary to resolve residual information problems in the capital market, the next question is whether the regulatory system can be trusted to design and enforce disclosure rules that maximize social welfare. In this subsection, we briefly review key theories

of economic regulation and discuss some salient evidence on their relevance for corporate disclosure and financial reporting regulation.

2.2.1. Public interest theory of regulation

The public interest theory emerges naturally from the justifications for regulation discussed in Section 2.1. It assumes that regulators can resolve or strive to resolve the residual information problems by designing and enforcing regulation that maximizes social welfare (Pigou, 1920). According to this theory, governments and their regulatory agencies are benign, free from private interests, and capable of estimating the social costs and benefits of regulation. While the public interest theory might not be a precise description of what governments do, it does prescribe an ideal of how regulation should be carried out. More importantly, it serves as an overarching motivation for researchers to evaluate the aggregate costs and benefits of disclosure regulation. Prior literature in accounting and finance tends to examine the effect of disclosure regulation on firm-level costs and benefits, and there is limited evidence on the net aggregate effect of disclosure regulation. One notable exception is Breuer (2021), who examines the effect of reporting and auditing mandates on aggregate resource allocation. The author finds that financial reporting mandates facilitate ownership dispersion in capital markets and spur competition in product markets. However, the effects of reporting mandates on aggregate productivity and growth are ambiguous.

2.2.2. Capture theory of regulation

The capture theory of regulation challenges the public interest theory's assumption of a benevolent and competent government (Stigler, 1971; Peltzman, 1976). Under the capture theory, self-serving regulators are captured by various interest groups, who compete for and against regulation (Becker, 1983). The resultant regulation represents regulators' own utility-maximizing choice, depending on the relative pressure applied by different interest groups. Therefore, the regulation is unlikely to be socially optimal under the capture theory.

In the context of disclosure regulation, the accounting and finance literature has examined whether firms can influence the SEC's regulatory decisions (e.g., Ramanna, 2008; Correia, 2014; Heese, Khan, and Ramanna, 2017; Mehta and Zhao, 2020; Thompson, 2022). For example, consistent with regulatory capture, Correia (2014) finds that firms use political contributions and lobbying to establish long-term connections to powerful politicians, and these politicians then influence SEC enforcement actions to the benefit of their connected firms. In contrast, Heese, Khan, and Ramanna (2017) find that political connections are positively associated with the likelihood of firms receiving SEC comment letters, inconsistent with SEC capture. Thompson (2022) examines the relation between political connections and Confidential Treatment (CT) Orders, which are regulatory exemptions issued by the SEC that permit firms to redact information. The author explores a regime shift triggered by the Congressional investigation and hearing into the SEC's CT process in late 2009 and early 2010 following American International Group's CT request to redact its Troubled Asset Relief Program contract with the Federal Reserve Bank of New York. The author finds that CT requests from politically connected firms are less likely to be rejected before the regime shift but are more likely to be rejected following the regime shift. Overall, the evidence for SEC capture is somewhat mixed, depending on the type and time of SEC decisions examined.

2.2.3. Ideology theory of regulation

The ideology theory of regulation posits that regulators are neither as benevolent as suggested by public interest theory nor as self-serving as assumed in capture theory (Grossman and Helpman, 1994; Austen-Smith, 1995). Under the ideology theory, regulators have ideologies but are open to lobbying from constituents with specific knowledge (Kothari, Ramanna, and Skinner, 2010). Bischof, Daske, and Sextroh (2020) provide some of the first evidence that political ideology plays a role in the politics of accounting standard setting. They show that in addition to special interest pressure, ideology explains politicians' stance in the debate about fair value accounting and the expensing of employee

stock options. In addition, political ideology is likely to play a stronger role in disclosure and accounting rules that have strong real or social consequences, such as bank accounting rules that determine regulatory interventions (e.g., Yue, Zhang, and Zhong, 2022).

2.2.4. Summary

Overall, evidence from the accounting and finance literature appears to provide partial support for all three theories of regulation in the context of setting and enforcing disclosure and financial reporting rules. However, the empirical literature on the political economy of disclosure regulation is still relatively nascent in the disclosure literature. This area of investigation may merit further efforts, particularly about the aggregate effects of disclosure regulation.

3. Examples of Disclosure Regulation

This section uses three examples to illustrate the economic consequences of disclosure regulation. These three disclosure mandates relate to the production, dissemination, and presentation of corporate disclosures and are widely studied in academic research. We use them to highlight how disclosure mandates affect not only firms' information environment but also corporate investment decisions. As mentioned earlier, the existing research focuses primarily on the firm-level effects of disclosure mandates, but there is some limited evidence on the aggregate effects of disclosure regulation.

3.1. Regulation of information production

How often should firms report their financial statements? While the United States has required quarterly reporting since 1970, regulators around the world still vigorously debate whether to adopt or abolish quarterly reporting. For example, the European Union started to require companies to produce narrative interim management statements on a quarterly basis in 2004 but stopped this requirement in 2013.[2] Singapore had required quarterly reporting for some of its firms since 2003 but

[2] https://ec.europa.eu/commission/presscorner/detail/fr/MEMO_13_544.

scrapped it in 2020.[3] In 2018, the U.S. President Donald J. Trump asked the SEC to evaluate the quarterly reporting system and consider moving back to the semi-annual reporting system.[4]

Given the practical relevance of this topic, a large academic literature has emerged to decipher the determinants and economic consequences of financial reporting frequency. Early research examines whether a firm's voluntary provision of interim financial reports prior to SEC regulation reflects the cost-benefit tradeoffs facing managers under an agency framework (Leftwich, Watts, and Zimmerman, 1981). This early work is largely descriptive and yields some puzzling results. For example, semiannual reporters on the American Stock Exchange in 1948 exhibit a higher leverage ratio than both annual and quarterly reporters. This result is inconsistent with the agency view that firms with a higher leverage ratio need to commit to more intensive monitoring by reporting more frequently. Researchers attribute these puzzles to methodological problems in association studies.

Capital markets research has examined how the frequency of financial reporting affects the information content of annual reports, earnings timeliness, and the cost of equity. Early evidence shows that the stock return variability at the annual report announcement date in the "annual-plus-quarterly-reports" environment is lower than that in the "annual-report-only" environment (McNichols and Manegold, 1983). This finding is consistent with the theoretical prediction that interim reporting leads to a reduction in the information content of annual reports. However, semiannual reporters and quarterly reporters do not exhibit significant differences in earnings timeliness, i.e., the speed with which accounting information is reflected in stock prices (Butler, Kraft, and Weiss, 2007). Further evidence shows that firms that voluntarily adopted quarterly reporting experienced an increase in earnings timeliness, but firms that increased reporting frequency due to the SEC mandate did not (Butler, Kraft, and Weiss, 2007). More recent work shows that more frequent

[3] https://www.reuters.com/article/sgx-regulations/singapore-exchange-scraps-compulsory-quarterly-reporting-for-companies-idUSL4N29E1B1.
[4] https://www.wsj.com/articles/trump-directs-sec-to-study-six-month-reporting-for-public-companies-1534507058.

reporting leads to a reduction in information asymmetry and the cost of equity for both mandatory and voluntary adopters (Fu, Kraft, and Zhang, 2012). Overall, there is evidence that more frequent financial reporting improves the information environment.

A more recent line of work aims to understand the real effects of financial reporting frequency (Roychowdhury, Shroff, and Verdi, 2019). There are two opposing forces of increasing financial reporting frequency. On the one hand, an increase in reporting frequency can enhance transparency and monitoring. On the other hand, frequent reporting can reduce managers' decision horizon and induce myopia. Research has examined various managerial decisions, including capital investment (Nallareddy, Pozen, and Rajgopal, 2017; Kraft, Vashishtha, and Venkatachalam, 2018; Kajüter, Klassmann, and Nienhaus, 2019), real activities manipulations (Ernstberger, Link, Stich, and Vogler, 2017), cash holdings (Downar, Ernstberger, and Link, 2018), banks' loan portfolio quality (Balakrishnan and Ertan, 2018), and corporate innovation (Fu, Kraft, Tian, Zhang, and Zuo, 2020). The evidence is mixed. For example, U.S. firms decreased their capital investment levels after a reporting-frequency increase (Kraft, Vashishtha, and Venkatachalam, 2018), but no such evidence is found for firms in the United Kingdom or Singapore (Nallareddy, Pozen, and Rajgopal, 2017; Kajüter, Klassmann, and Nienhaus, 2019).

Most of the research in this area utilizes the reporting frequency change in the United States as the empirical setting. The SEC started to require listed firms to provide annual reports in 1934, semiannual reports in 1955, and quarterly reports in 1970. Researchers can use a sample over this period (e.g., 1951–73) for empirical analysis. Such a sample has at least two desirable features. First, there is significant cross-sectional and time-series variation in reporting frequency. Second, since some firms had voluntarily adopted more frequent reporting prior to the SEC mandate, researchers can use these voluntary adopters as controls in a difference-in-differences analysis. Prior research often focuses on the firm-level effects of reporting frequency mandates. However, more recent work has

started to pay attention to the externalities of reporting frequency mandates on firms whose reporting frequency is not affected by the mandate. As we have discussed earlier, this step is important, as evidence on aggregate effects and externalities from regulation is crucial to justify regulation (Leuz and Wysocki, 2016). Fu, Kraft, Tian, Zhang, and Zuo (2020) is one example of a study in which the researchers explicitly consider and examine the externalities and aggregate effects of reporting frequency mandates. The authors find no evidence that the externality effect on industry peers is statistically significant, and they conclude that the aggregate effect of frequent reporting on total innovation (including both treatment effects and spillover effects on peer firms) appears to be negative.

Overall, academic research suggests that disclosure regulation has both benefits and costs. While the benefits of enhanced disclosure and transparency for directly affected firms are relatively straightforward, it is less clear how to assess the positive and negative externalities and aggregate effects. In addition, it is not the case that "more is better," since more disclosures not only entail certain compliance costs but also may pressure managers to meet investors' short-term expectations. Adopting more realistic assumptions about the behavior of investors and managers can help us better understand and predict the effects of enhanced disclosures (Hanlon, Yeung, and Zuo 2022).

3.2. Regulation of information dissemination

Information dissemination technologies have greatly increased the timeliness of firm disclosures and reduced the costs of accessing them. With technological advances, the SEC has implemented a series of regulatory changes to improve the accessibility of firm disclosures to the public. For example, in 1993 the SEC began to mandate electronic submission of corporate filings through the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system, and in 2013 the SEC allowed companies to use social media outlets (e.g., Facebook and Twitter) to announce key information. These fundamental changes in information dissemination brought by modern technologies affect not only capital markets but also firms themselves. In this subsection, we use the

EDGAR implementation as an example to illustrate the economic consequences of enhanced information dissemination (Gao and Huang, 2020; Chang, Ljungqvist, and Tseng, 2021; Goldstein, Yang, and Zuo, 2022).

Before the EDGAR system was implemented in 1993, the SEC required firms to submit paper copies of filings, which were then stored in its public reference rooms located in Washington D.C., New York, and Chicago. In each location, one or two copies of the same filing were available for the public to access. A *New York Times* (1982) article described these public reference rooms as "a zoo" in which "files are often misplaced or even stolen."[5] Instead of physically visiting these reference rooms, investors could subscribe to commercial data vendors, which often charged a nontrivial fee. These paper filings also entailed a significant production lag for data aggregators such as Standard & Poor's (D'Souza, Ramesh, and Shen, 2010). Because of this restricted and delayed access to SEC filings, there was significant information asymmetry among investors even though these filings were "public."

On February 23, 1993, the SEC began to require registered firms to submit their filings electronically. In the EDGAR system's phase-in schedule, the SEC divided all registered firms into ten groups based on firm size and required each group to file electronically after a specified implementation date (SEC Release No. 33-6944 and No. 33-6977). All firms in the first group (i.e., Group CF-01) were required to file electronically in April 1993, and firms in the last group (i.e., Group CF-10) could wait until May 1996 to do so.

Gao and Huang (2020) exploit this staggered timing of the EDGAR implementation and provide some causal evidence on the capital market effects of information dissemination. Specifically, Gao and Huang (2020) find that the EDGAR implementation leads to an increase in information production by individual investors and analysts. After the EDGAR implementation, individual investors' stock trades become more informative about future returns, and sell-side analysts' forecasts

[5] See "S.E.C. Data: Difficult Hunt" by the *New York Times* (May 19, 1982).

also become more accurate. In addition, stock pricing efficiency improves after a firm starts filing electronically via the EDGAR system. Together, these findings indicate that greater and broader information dissemination facilitated by the EDGAR system improves forecasting price efficiency, i.e., the extent to which stock prices reflect all publicly available information.

Using the EDGAR shock, Goldstein, Yang, and Zuo (2022) show that the EDGAR implementation leads to a lower cost of equity capital and an increase in the level of equity financing and corporate investment. They further show that these effects are concentrated in value firms, consistent with the EDGAR shock primarily affecting corporate disclosures about assets in place. In addition, they provide evidence suggesting that greater information dissemination facilitated by the EDGAR system leads to a decrease in revelatory price efficiency (i.e., the extent to which prices reveal new information to managers) and managerial learning from prices. Overall, these findings indicate that information dissemination technologies entail a tradeoff between improved equity financing and reduced managerial learning from prices.

Overall, the findings highlight both the benefits and costs of broader information dissemination. While it is intuitive that greater information dissemination facilitated by technologies can benefit less-sophisticated investors and level the playing field in the market, it does not necessarily make firms themselves better off if doing so reduces investors' incentives to acquire information that can be useful for firm managers. These findings have implications for various FinTech innovations. FinTech innovations often make it easy for the investing public to get a huge amount of data at low cost, thereby improving forecasting price efficiency. However, FinTech innovations can also dampen sophisticated investors' incentives to acquire information and reduce revelatory price efficiency. It would be interesting to evaluate the tradeoffs brought by various modern information technologies.

3.3. Regulation of Information Presentation

The SEC has long required firms to clearly present information and use plain English in all financial disclosures (SEC, 1998). In the past, the SEC requirements were concerned primarily with making disclosures clear and accessible to human readers. More recently, the SEC has started to require firms to present information in a way that can be easily accessed and processed by machines. For example, in April 2009, the SEC required registered firms to file financial statements in the eXtensible Business Reporting Language (XBRL) format. There is also a trend of adopting XBRL worldwide; as of October 2019, more than 50 countries had adopted it.[6] Several U.S. states (e.g., Florida, California) have either adopted or are planning to adopt XBRL for the reporting of governmental financial information.[7] This recent trend engenders a lot of research on whether and how the presentation of firm disclosures (e.g., XBRL format) affects capital markets and firms.

The XBRL mandate requires firms to tag numerical values in the financial statements using either standard tags defined in the XBRL taxonomy or customized tags. This process is not trivial to firms, and firms often make mistakes when they begin to tag numerical values. Amit Varshney, a top research analyst at Credit-Suisse, once stated: "I thought the XBRL documents were created to promote the mass consumption of financial reporting data, but that's not the case because of the inconsistent tagging. If I have to collect the data for a handful of companies, I still find it easier to hand collect it from the HTML document" (Harris and Morsfield, 2012).

Similar to the EDGAR implementation, the XBRL implementation has also been staggered. Firms were divided into three tiers based on their public float, i.e., the market value of publicly tradable shares. The "large accelerated filers" with a public float over $5 billion were tier-1 firms and were required to start XBRL filings in fiscal year 2009. The remaining "large accelerated filers" with a public

[6] https://www.forbes.com/sites/forbesfinancecouncil/2019/10/21/how-well-do-you-speak-this-financial-language.
[7] https://www.govtech.com/biz/Can-Standardized-Financial-Data-Help-Government-Save-Money.html.

float between $700 million and $5 billion were tier-2 firms and were required to start XBRL filings in fiscal year 2010. The remaining smaller filers were tier-3 firms and were required to start XBRL filings in fiscal year 2011. During the first year of XBRL adoption, firms only needed to tag the numerical values in the financial statements and tag each footnote as a text block. After the initial year, firms were required to adopt detailed tagging, i.e., tagging each numerical value (whether in financial statements or footnotes) separately.

A growing body of research examines the effects of XBRL on capital markets and firms in the fields of both information systems and accounting (Blankespoor, deHaan, and Marinovic, 2020). Blankespoor, Miller, and White (2014) provide evidence that XBRL-adopting firms exhibit higher bid-ask spreads, lower liquidity, and lower trading volume in the year right after the XBRL mandate. These findings suggest that more sophisticated investors can leverage their resources to derive greater benefits from XBRL than less sophisticated investors. Thus, there is greater information asymmetry among investors after the XBRL implementation. Blankespoor (2019) utilizes the setting of XBRL detailed tagging requirements and examines how investors' information processing costs affect firms' disclosure choice. The author finds that firms increase their quantitative footnote disclosures after the XBRL detailed tagging mandate. This result suggests that firms do consider the information processing costs of investors while making their disclosure choices.

A more recent study by Li, Zhu, and Zuo (2021) examines whether and how a firm's XBRL adoption affects its financial statement readability. The authors use a difference-in-differences approach and show that the XBRL mandate leads to a decrease in the readability of the HTML-formatted annual reports, especially for those adopters with more quantitative disclosures, those with smaller firm size, and those with a higher level of financial complexity. The authors further show that the annual reports of XBRL adopters contain more grammatical violations but not more words.

Overall, these findings suggest that XBRL adoption diverts managers' attention in initial years and can negatively affect managerial decision-making.

Overall, evidence suggests that financial reporting technologies such as XBRL significantly affect not only how investors process firm information but also how firms construct and disseminate quantitative and qualitative disclosures. The existing studies largely focus on the relatively short-term impacts of XBRL adoption, given that it is a recent phenomenon. Future research can examine the long-term effects of XBRL adoption and the dynamic adjustment processes of investors and firms. It would be also interesting to understand how the Inline XBRL format (i.e., embedding XBRL data directly into an HTML document) required by the SEC in 2018 affects capital markets and firms.[8]

4. Mandatory ESG Disclosures

On March 21, 2022, the SEC proposed rules to enhance and standardize climate-related disclosures in firms' registration statements and periodic reports. The proposed rules would require firms to provide "information about climate-related risks that are reasonably likely to have a material impact on their business, results of operations, or financial condition, and certain climate-related financial statement metrics in a note to their audited financial statements."[9] In particular, the proposed rules would require firms to provide disclosures of direct greenhouse gas emissions (Scope 1) and indirect emissions from purchased energy (Scope 2). Firms would also be required to disclose greenhouse gas emissions from the upstream and downstream value chains (Scope 3) when these emissions are material or when firms have set an emission target that includes these emissions. Similar ESG-related disclosure mandates have already been implemented in the European Union, e.g., the Non-Financial Reporting Directive in 2014, the Sustainable Finance Disclosure Regulation in 2019, and the Taxonomy Regulation in 2020. In 2022, Singapore also introduced a phased approach to

[8] https://www.sec.gov/structureddata/osd-inline-xbrl.html.
[9] https://www.sec.gov/news/press-release/2022-46.

mandatory climate reporting. In the following, we first summarize the rationale for such disclosures in a market economy and then discuss the potential economic consequences of such disclosures.

Adam Smith (1776) noted long ago that individuals' pursuit of self-interest can lead to the maximization of social welfare through the invisible hand (i.e., the free-market mechanism). This is true in a perfectly competitive market with perfect information and no externalities. In this setup, it is assumed that people act as if they fully understand the costs and benefits of their choices. However, we know that people make decisions based on their perceptions, which can (and in fact often do) deviate from reality (Graham, 2022; Hanlon, Yeung, and Zuo, 2022). In many situations, people do not fully understand or internalize how their decisions will harm their own future or future generations. Here are a few quotes from early economists, as noted by Thaler (2016):

> "The pleasure which we are to enjoy ten years hence, interests us so little in comparison with that which we may enjoy today." Smith (1759, p. 273)
>
> "Our telescopic faculty is defective and … we therefore see future pleasures, as it were, on a diminished scale." Pigou (1920, p. 21)
>
> "This is illustrated by the story of the farmer who would never mend his leaky roof. When it rained, he could not stop the leak, and when it did not rain, there was no leak to be stopped!" Fisher (1930, p. 82)

The traditional capital budgeting model in corporate finance and other valuation courses often focuses on forecasting cash flows over the next five to ten years, and it assumes that once firms reach the steady state, these cash flow patterns will last forever (e.g., Lundholm and Sloan, 2019). Some criticize this as an intrinsic limitation of our current forecasting approach – if something is going to happen in the distant future, we ignore it in our financial modelling. On the other hand, the approach might be understandable (and arguably "reasonable" or "acceptable") because the impact of such "distant" risks (e.g., climate risk) on a firm's financial performance is very difficult, if not impossible,

to quantify. And there is a heated debate on whether and what information related to such distant risks can be credibly disclosed in a firm's SEC filings (Bolton, Kacperczyk, Leuz, Ormazabal, Reichelstein, and Schoenmaker, 2021; Karpoff, Litan, Schrand, and Weil, 2022; LoPucki, 2022).

On carbon emissions, while it is relatively straightforward to require firms to disclose their operational emissions (i.e., Scope 1 emissions), and perhaps it is straightforward for firms to report their emissions from their energy consumption (i.e., Scope 2 emissions), it is more difficult for firms to accurately compute and report emissions attributed to their suppliers and customers (i.e., Scope 3 emissions). These supply-chain emissions are often much more significant than the operational emissions. For example, Apple stated that it emitted 47,430 tons of greenhouse gases in the fiscal year ending September 26, 2020, and the emissions by its suppliers and customers were 475 times as large at 22 million tons.[10] Thus, ignoring a firm's Scope 3 emissions can significantly underestimate its climate impact. In addition, the production of some green products may create significant Scope 3 emissions. For example, the solar industry relies heavily on coal-burning power plants to produce polysilicon, an essential component in most solar panels.[11] While the use of solar panels can materially reduce carbon emissions in electricity generation relative to the use of fossil fuels, the production of solar panels can entail a significant amount of carbon emissions.

Proponents of climate disclosures claim that requiring firms to consider and report these different scopes of carbon emissions has several benefits, despite the difficulty of gathering accurate data. After all, the goal of this disclosure requirement is not simply to get data on carbon emissions, but also to alter firm and individual behavior (Christensen, Hail, and Leuz, 2021). First, people (including corporate managers) have limited attention, and asking them to report those carbon data in their firms' SEC filings can force managers to allocate their attention to this important aspect of

[10] https://www.wsj.com/articles/climate-disclosure-poses-thorny-questions-for-sec-as-rules-weighed-11645180200.
[11] https://www.wsj.com/articles/behind-the-rise-of-u-s-solar-power-a-mountain-of-chinese-coal-11627734770.

production processes. Like sending warnings to those who smoke, explicitly requiring firms to disclose carbon data can enhance the self-awareness of the potential climate impact of their actions. Second, the goal of mandatory disclosure is not only to give investors the information that they want (for green or sustainable investing), but also to induce managers to choose more desirable actions, although unanimity on what is desirable is highly unlikely. If the market assigns a high cost to carbon emissions, the manager of the firm has an economic incentive to adopt alternatives to achieve the firm's commercial objectives, i.e., the manager must make an optimal cost-benefit decision. Third, emission information might enable major corporate customers to discipline their suppliers through pricing and purchase decisions (e.g., Chen, Su, Tian, Xu, and Zuo, 2022). For example, suppliers of a major corporate customer that faces stringent environmental regulation and enforcement may alter their behavior toward environmental protection even if these suppliers are subject to less stringent legal requirements or enforcement. This potential outcome is offered as a justification for Scope 3 disclosures. If all firms, public or private, faced the same level of legal requirement and enforcement for environmental protection, then Scope 3 disclosures might be redundant. However, given that private firms and firms in less developed countries are often under loose legal requirements regarding environmental protection, Scope 3 disclosures are hypothesized to be helpful in achieving global environmental protection through a market mechanism.

Because it can be difficult to accurately track the emissions by suppliers or customers, a science-based disclosure framework might be more objective and therefore more credible. For example, instead of requiring firms to track the carbon emissions of their suppliers, a potentially simpler approach that can generate verifiable and auditable data is to require firms to report the generic production processes of their suppliers (e.g., coal-burning or solar). This type of disclosure is more detailed than industry averages but nevertheless requires no specific technological know-how. This kind of generic, input-based disclosure framework does not lead to concerns about disclosing the

proprietary information of their suppliers, and it produces data that can be verified by a third party. However, to understand what data are potentially important to estimate the amount of carbon emissions requires regulators and preparers to make choices among divergent scientific data. It is also important to consider the expected direct and indirect costs of the regulation. Direct costs would include compliance costs for firms to meet the disclosure requirements. Indirect costs would include potential litigation risk or leakage of proprietary information. This cost consideration leads the SEC to exempt smaller reporting companies from the Scope 3 emissions disclosure requirement in the proposed rules.

Overall, we believe that accounting researchers can leverage their institutional knowledge and contribute significantly to non-financial disclosure regulation just as they contribute to financial disclosure regulation by examining the benefits, costs, externalities, and aggregate effects of the regulation. In this process, it is also important to bring scientists, economists and business practitioners into the discussion.

5. Concluding Remarks

In our review of the theories and empirical evidence of disclosure regulation, we conclude that disclosure regulation is likely justified. First, market forces, private contracts and enforcement, and various non-traditional, non-regulator monitors are unlikely to resolve all the information problems in the capital market. Second, disclosure carries substantial costs for the disclosing firms, which cannot enjoy the full benefit of disclosure. This leads to the underproduction of information from a society's point of view. The literature has provided mounting evidence on the firm-level benefits of disclosure regulation. However, we still have limited evidence on the net aggregate effect of disclosure regulation, which is crucial to evaluating whether disclosure mandates are indeed necessary or desirable. Moreover, the recent development of technology (such as regulation technology or RegTech) likely changes the direct costs of information production and regulatory compliance, thereby re-shaping the welfare

analysis of disclosure regulation. It would be interesting to examine whether and how the development of technology makes disclosure regulation more or less effective in improving the financial market and real economic efficiency.

Since the call of Kothari, Ramanna, and Skinner (2010), we have seen a growing number of studies on the political economy of disclosure and reporting regulation. From the empirical evidence, our overall impression is that all three theories of regulation (public interest, capture, and ideology) are relevant in explaining the current status of disclosure regulation. Going forward, it would be interesting to examine how the three theories interact in explaining the creation, enforcement, and consequences of disclosure regulation. For example, researchers could examine how the aggregate effect of disclosure regulation is influenced by the relative power of interest groups and how ideological congruence between interest groups and regulators affects the influence. Currently, researchers tend to rely on explicit political contributions and lobbying to identify firm connections to politicians. It would be interesting to expand the analysis by identifying less explicit links between politicians and their constituencies for a more complete picture of political influence on disclosure regulation. For example, researchers could examine social networks and charitable giving (e.g., Bertrand, Bombardini, Fisman, and Trebbi, 2020).

Regarding emerging issues of disclosure regulation, we offer some thoughts on ESG disclosure mandates, which are arguably among the most important topics in today's disclosure regulation. The pandemic of the past three years has accelerated the adoption of digital technologies in various aspects of business. This creates many new challenges for disclosure and reporting regulation. For example, a growing number of companies are incorporating cryptocurrencies (e.g., Bitcoin) and nonfungible tokens (NFTs) into their business. Companies currently account for these digital assets as indefinite-lived intangible assets based on some non-binding guidelines. However, there are no specific accounting or disclosure rules for these digital assets from accounting standard setters. Therefore, it

is important for regulators and researchers to understand the nature of these assets and their market dynamics and evaluate whether current accounting or disclosure rules apply to various digital assets, and if not, what new rules are needed. Another prominent development in the capital market is that companies and investors have increased their reliance on social media to acquire and disseminate information. However, due to the largely unregulated nature of social media, the reliability of information is a big challenge. Thus, it is important to understand how information on social media increases or decreases market efficiency and how regulators can step in to improve the situation.

Finally, we note that most disclosure regulation literature is based on U.S. settings. As North (1994, p. 366) notes, "economies that adopt the formal rules of another economy will have very different performance characteristics than the first economy because of different informal norms and enforcement." Therefore, we need more research to understand how various informal norms and enforcement affect the implications of otherwise similar disclosure regulation (e.g., Hail, Tahoun, and Wang, 2018).

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