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Production and dissemination of corporate information in social media: A review

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ABSTRACT

The emergence of social media as a corporate disclosure channel has caused significant changes in the production and dissemination of corporate information. This review identifies important themes in recent research on the impact of social media on the corporate information environment and provides suggestions for further explorations of this new but fast-growing area of research. Specifically, we first review the evolution of Internet-based corporate disclosure and related regulations, and then focus on three recent streams of research: 1) companies' use of social media; 2) information produced by non-corporate users and its impact on capital markets; and 3) the credibility of corporate information on social media platforms.

1. Introduction

The recent advent of social media,¹ particularly real-time social networking sites such as Twitter, Facebook, Glassdoor, Seeking Alpha, and StockTwit, has significantly changed the way information is produced and disseminated in capital markets. These social media platforms enable companies and their stakeholders to engage in cost-effective, real-time online conversations. The interactive nature of social media communication distinguishes it from other types of Internet-based disclosure outlets, which are primarily one-way communication channels, transmitting information from companies to interested stakeholders (Lovejoy, Waters, & Saxton, 2012; Miller & Skinner, 2015). Specifically, real-time social network platforms encourage users' feedback, extend conversations, develop or strengthen social bonds between the company and stakeholders, and provide instant notifications to interested stakeholders (Blankespoor, Miller, & White, 2014; Blankespoor, 2018; Elliott, Grant, & Hodge, 2018; Miller & Skinner, 2015). More importantly, more and more investors view corporate information on social media platforms as informative and credible inputs for decision making (Zeledon, 2009).

In 2013, recognizing that companies were increasingly using social media to convey information, the Securities and Exchange Commission (SEC) approved Facebook and Twitter, the two most influential social media platforms, as formal corporate disclosure outlets. Since then, an increasing number of companies and executives have used social media platforms to highlight important financial information and significant corporate events, and investors now react to the information in social media. For example, a tweet by Tesla's CEO, Elon Musk about taking Tesla private resulted in a 6% increase in Tesla's stock price in August 2018. However,

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¹ Social media is broadly defined as any Internet-based application that builds on Web 2.0 foundations and allows the creation and exchange of user-generated content (Kaplan & Haenlein, 2010). This review focuses on social networking sites, as they are increasingly employed by companies for corporate disclosure. The terms "social media" and "social networking sites" are used interchangeably in this paper.

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the credibility of this tweet was subsequently questioned, and the SEC charged Elon Musk with securities fraud ([Securities & Exchange Commission \(SEC\), 2018](#)).² The incident raises questions about the trustworthiness of corporate information in social media and concerns about the legal consequences of releasing unverified and/or premature information via social media.

Although there has been extensive research on social media in many non-accounting disciplines, such as marketing (e.g., [Jansen, Zhang, Sobel, & Chowdury, 2009](#); [Kesavan, Bernacchi, & Mascarenhas, 2013](#); [Schniederjans, Cao, & Schniederjans, 2013](#)) and management (e.g., [Aula, 2010](#); [Gruber, Smerek, Thomas-Hunt, & James, 2015](#); [Heller Baird & Parasnis, 2011](#)), the accounting literature on social media only expanded after the SEC approved social media as a corporate information dissemination channel in 2013. In this paper, we review 24 published journal articles and 11 working papers from the 2011 to 2018 period and discuss the implications of the findings of these studies for accounting literature.³ In addition, most of the papers included in our review use Twitter as the research setting because it has surpassed other social media platforms (including Facebook) and become the dominant social media tool for investor relations management and corporate disclosure ([Blankespoor et al., 2014](#); [Debreceeny, Rahman, & Wang, 2017](#); [Elliott et al., 2018](#); [National Investor Relations Institute, 2013](#); [Prokofieva, 2015](#)).

We begin the review with a discussion of the evolution of Internet-based corporate disclosure channels and the related regulations. We then discuss three strands of research. We review the literature on firms' motives for adopting social media or using social media to disclose information, the characteristics of corporate disclosure in social media, and the capital market impact of such disclosure (Section 3). The reviewed papers generally show that firms with consumer-oriented business, strong technological competence, superior social and governance performance, and young CEOs are more likely to adopt social media for corporate disclosure. In addition, firms facing high information asymmetry are also more likely to use social media platforms to strategically disclose information and to enhance firm value. We then review studies that investigate the information produced by non-corporate social media users and its impact on the capital market (Section 4). These studies suggest that information provided and disseminated by non-corporate users has strong predicative power for companies' operational outcomes and stock returns. As the ultimate impact of social media disclosure on the corporate information environment depends on its credibility, we discuss the credibility of corporate information on social media platforms in Section 5. In Section 6, we summarize the practical recommendations and regulatory implications for successfully managing corporate information environments in the era of social media.

Our review contributes to the literature in three ways. First, it integrates recent empirical findings and identifies the determinants and consequences of producing and disseminating information via social media. Second, it provides insights that will help companies become aware of the benefits and challenges of using social media as a corporate disclosure channel, and also offers suggestions that will help companies and regulators to maximize the benefits and cope with the challenges brought by social media. Third, it provides suggestions for further research on the implications of social media for corporate information environment.

Our review differs from three other survey papers on social media recently published in accounting journals.⁴ [Arnold \(2016\)](#) mainly explores how experimental research can be used to examine the impact of technological changes in accounting (including Facebook and Twitter) on financial reporting and the auditing environment and on users' decision making. We review studies that employ a variety of research methods (archival, experimental, survey, and descriptive studies). [Debreceeny, Wang, and Zhou \(2018\)](#) primarily focus on the technologies and tools that archival researchers can employ to extract information from major social media websites. Our review discusses studies that investigate the relevance and implications of the information obtained from social media to the stakeholders in the capital market. [Teoh's \(2018\)](#) main focus is on using social media data to investigate how individuals and markets process information in general, whereas our review discusses studies of the impact of the information disseminated and produced in social media on firms' information environment. Lastly, our review is more comprehensive than that of [Miller and Skinner \(2015\)](#) or [Debreceeny \(2015\)](#), who comment on only the five papers that appear in the special issues of the *Journal of Accounting Research* and *Journal of Information System*, respectively.

2. Evolution of Internet-based corporate disclosure and related regulations

2.1. Evolution of Internet-based corporate disclosure

To reduce information asymmetry, companies disclose information so that investors can assess investment opportunities *ex ante* and monitor companies' use of their capital *ex post* ([Beyer, Cohen, Lys, & Walther, 2010](#); [Healy & Palepu, 2001](#)). A large number of disclosure mediums are available for communicating such information ([Mayew, 2012](#)), including annual reports, press releases, conference calls, etc. Since the mid- to late-1990s, companies have been disclosing important corporate information on their official

² Following SEC's investigation, Elon Musk settled with the SEC on September 30, 2018. He agreed to step down as the Chairman of Tesla for three years and pay a \$20 million fine.

³ The 24 journal articles are from *Accounting, Organizations and Society* (2), *The Accounting Review* (3), *Journal of Accounting Research* (3), *Journal of Information Systems* (5), *The Review of Financial Studies* (1), *Journal of Business Ethics* (2), *Decision Support Systems* (2), and other business journals (6). Our review also includes 11 unpublished working papers. This sample of 35 papers consists of 31 empirical studies and 4 research notes. Among the 31 empirical studies, 23 use archival data, 6 use experimental data, and 2 use survey data.

⁴ Our focus on the production and dissemination of corporate information in social media differentiates this paper from reviews of the literature on the regulation, determinants, and economic consequences of corporate disclosure in general ([Beyer et al., 2010](#); [Healy & Palepu, 2001](#)) and from other recent reviews of the literature on the use and the effects of Internet-based disclosure on corporate websites and reporting in the eXtensible Business Reporting Language (XBRL) format in the Securities and Exchange Commission's EDGAR data repository ([Securities & Exchange Commission \(SEC\), 2009](#)) (e.g., [Debreceeny et al., 2002](#); [Perdana, Robb, & Rohde, 2015](#)).

websites and using Internet-based communication tools to manage investor relations (Craven & Marston, 1999; Debreceeny, 2015). Early digital communication technologies and platforms, such as Rich Site Summary (RSS), eXtensible Business Reporting Language (XBRL), and the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) facilitate the preparation, publishing, exchanging, and dissemination of financial information (Ashbaugh, Johnstone, & Warfield, 1999; Baldwin, Brown, & Trinkle, 2006; Basoglu & Hess, 2014; Debreceeny, Gray, & Rahman, 2002; Ettredge, Richardson, & Scholz, 2002; Saxton, 2012), and greatly enhance the timeliness, relevance, and usefulness of corporate disclosure to stakeholders (Drake, Thornock, & Twedt, 2017). Moreover, XBRL reporting in the SEC's EDGAR system combines the immediacy and reach of Internet-based disclosure with a dictionary of standard tags describing accounting concepts, which further facilitates the decision-making of information consumers (Debreceeny, Farewell, Piechocki, Felden, & Gränig, 2010; Hoitash & Hoitash, 2018).

Given the abundance of corporate information on the Internet, investors proactively use search engines to seek and “pull” information from various online resources (Miller & Skinner, 2015; Vlastakis & Markellos, 2012). As a result, investors' online search behavior on Google, Yahoo, and EDGAR provide important insights into investors' information demand and acquisition. Da, Engelberg, and Gao (2011) document that an increase in Google search volume (GSV) predicts higher stock prices in the following two weeks. Bank, Larch, and Peter (2011) show that GSV is positively associated with trading activity and stock liquidity. Drake, Roulstone, and Thornock (2012) report that the GSV pattern is consistent with the pattern of stock trading volume and price behavior around companies' earnings announcements. Brown, Stice, and White (2015) document that state-level distracted driving restrictions on mobile communication significantly reduce Google search activities and have a significant negative impact on the liquidity of stocks. The positive association between investors' search behavior and stock trading volume and market liquidity is also observed when GSV is measured at the market level rather than the company level. For example, Vlastakis and Markellos (2012) find that GSV at the market level is positively related to market volatility and trading volume. Dimpfl and Jank (2016) document that the market level GSV co-moves with Dow Jones' realized volatility. Da, Engelberg, and Gao (2015) use the daily GSV of queries related to household concerns to construct a Financial and Economic Attitude Revealed by Search index and find that the index predicts stock return volatility and mutual fund flows.

In addition to GSV, researchers also document that retail investors' search behavior on Yahoo Finance (YFSV) and the Securities and Exchange Commission's EDGAR (ESV) is associated with price discovery in the equity market. Specifically, Lawrence, Ryans, Sun, and Laptev (2016) document that YFSV at earnings announcements is a major factor explaining earnings responses and is predictive of subsequent returns. Drake, Roulstone, and Thornock (2015) document that EDGAR requests for prior-period 10-Ks and 10-Qs on the earnings announcement date are positively associated with earnings responsive coefficients and negatively associated with the post-earnings-announcement drifts, implying that an increase in ESV improves the speed at which new information is impounded into prices. In their study of institutional investors' information acquisition and price discovery, Ben-Rephael, Da, and Israelsen (2017) find that institutional investors' news search and reading frequency for specific stocks on Bloomberg terminals facilitates the incorporation of new information into asset prices and reduces price drifts following both earnings announcements and analyst recommendation changes.

In the most recent decade, social media platforms have revolutionized the production and dissemination of corporate information on Internet-based platforms in at least three ways. First, most social media platforms employ direct-access information technologies (DAITs) that “push” information directly to users rather than requiring them to proactively seek information (Blankespoor et al., 2014; Crowley, Huang, & Lu, 2018; Snow & Rasso, 2017).⁵ Second, social media platforms allow companies to initiate and disseminate information to consumers in real-time without going through information intermediaries (Kaplan & Haenlein, 2010; Miller & Skinner, 2015). As a result, social media platforms help information users to locate and access timely information at low to zero acquisition costs. Third, social networking sites permit the creation and exchange of user-generated information. Specifically, social media users can freely post information, respond to information provided by companies, and engage in multi-directional interactions with companies and other stakeholders (Lee, Hutton, & Shu, 2015; Rennekamp & Witz, 2018; Teoh, 2018; Trinkle, Crossler, & Bélanger, 2015). In other words, information about companies in social media comes not only from the companies, but also from other social media users, who play a key role in shaping public opinion and influencing market responses (Bartov, Faurel, & Mohanram, 2018; Blankespoor, 2018; Bollen, Mao, & Zeng, 2011; Debreceeny et al., 2017; Jansen et al., 2009; Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). As social media platforms transform previously passive information consumers into powerful creators and transmitters of corporate information (Alexander & Gentry, 2014), companies now face unprecedented opportunities and challenges in managing their information environment (Kaplan & Haenlein, 2010; Miller & Skinner, 2015).⁶

2.2. Regulation of corporate disclosure via social media

In response to the growing use of social media for producing and disseminating corporate information, regulators have issued various regulations for corporations' production and dissemination of information and are beginning to provide guidance for users who are seeking to process the information in social media. Specifically, Regulation Fair Disclosure (Reg FD), which was enacted in

⁵ To lower investors' information acquisition cost and speed up the process of price formation and discovery, companies can also use email alerts to “push” disclosure to the target users directly (Guggenmos & Bennett, 2017). However, such one-way “push” approaches to information dissemination do not allow two-way communication between the companies and stakeholders.

⁶ In addition, public accounting firms are becoming aware of the usefulness of social media. Big 4 audit firms use Facebook and Twitter for knowledge sharing, and non-Big 4 audit firms use Facebook and Twitter for branding and marketing (Eschenbrenner, Nah, & Telaprolu, 2014).

2000, requires public companies to disclose material non-public information to all investors by issuing press releases or filing 8Ks with the SEC. However, there was no clear guidance on whether publishing information in social media complied with Reg FD until the Netflix incidence in 2012. In July, 2012, the CEO of Netflix, Reed Hastings, posted a message about the monthly viewership of Netflix on his personal Facebook account rather than filing an SEC form or issuing a press release. Immediately, the SEC initiated an investigation into whether publishing information only in social media constitutes a violation of Reg FD. Four months later, the SEC decided not to pursue the enforcement action against Netflix or Hastings; instead, the SEC ended the uncertainty, stating that “companies can use social media outlets like Facebook and Twitter to announce key information in compliance with Reg FD so long as investors have been alerted about which social media will be used to disseminate such information” (Securities & Exchange Commission (SEC), 2013a; Securities & Exchange Commission (SEC), 2013b). Further, in 2015, the SEC, in a “Compliance and Disclosure Interpretations,” announced that companies can post a Twitter message about its stock or debt offering to gauge interest among potential investors. This announcement continues the SEC’s position of supporting the use of social media for corporate disclosure.⁷

3. Companies’ use of social media

A company may voluntarily adopt social media to communicate with various stakeholders and use social media as an integral part of its disclosure strategy based on a costs and benefits tradeoff (Healy & Palepu, 2001). This section reviews recent research on the motives for adopting social media as a corporate communication channel, the characteristics of the information companies disclose in social media, and how the information affects capital markets. Table 1 provides a list of the studies reviewed in this section.

3.1. Motives for adopting social media

A company’s decision to adopt social media as a general communication channel is influenced by various economic and non-economic factors such as a company’s industry membership, operational expenses (e.g., expenditures on advertising), financial performance, technological competence, mobile environments, and management styles (Bamber, Jiang, & Wang, 2010; Jung, Naughton, Tahoun, & Wang, 2018; Lee et al., 2015; Schaupp & Bélanger, 2014; Zhou, Lei, Wang, Fan, & Wang, 2015).

Zhou et al. (2015) show that the adoption of Facebook and Twitter by U.S. public companies varies across industries. They find that the adoption rate of these two social media platforms is the highest among retailers and lowest for companies in public administration, which is consistent with the argument that consumer-oriented companies use social media as a low-cost and effective means for managing consumer relationships. These findings are echoed by Lee et al. (2015) and Jung et al. (2018), who find that companies that spend more on advertising are more likely to adopt Twitter for customer service. Using survey and interview data, Schaupp and Belanger (2014) find that customers are key players pushing companies’ adoption of social media, and that technological competence and mobile environments are determinants of social media adoption for small businesses in the areas of marketing, employee recruitment, and overall communication with clients. Lee, Oh, and Kim (2013) show that to enhance the effectiveness of corporate-communication and maintain influence with stakeholders, companies with higher corporate social responsibility reporting (CSR) ratings are more likely to adopt social media. Huang, Lu, and Su (2016) find that companies with better environmental performance are more likely to use Twitter to highlight their prosocial behavior. In addition, both Lee et al. (2015) and Jung et al. (2018) show that younger CEOs are more likely to adopt Twitter. Yang, Liu, and Zhou (2016) find that companies with better governance mechanisms are more proactive in adopting Twitter.

The adoption of social media as a communication channel is a prerequisite for the use of social media to convey corporate information. A number of studies have investigated firms’ decision to use social media for corporate disclosure. According to Zhou et al. (2015), about 3% of the messages released by public firms on Twitter and 7% on Facebook disclose corporate information. Zhang (2015) finds that firms’ decision to publish corporate information in social media is affected by the percentage of companies in the same industry adopting new media (e.g., social media, mobile apps, RSS), information asymmetry, and corporate profitability. Jung et al. (2018) find that among S&P 1500 companies, larger companies with higher market-to-book ratios, lower leverage ratios, and more analyst coverage are more likely to use Twitter to disclose corporate information. Bhagwat and Burch (2016) find that companies, especially those that are less visible due to smaller size, fewer analysts’ coverage, and lower institutional ownership, are more likely to use Twitter to mitigate investors’ limited attention to the company’s news.

3.2. Characteristics of corporate disclosure in social media

Recent research also shows that companies use social media to disclose a variety of information to stakeholders. For example, Blankespoor et al. (2014) document that high tech companies “push” links of press releases on Twitter. Using a sample of Australian Stock Exchange companies, Prokofieva (2015) shows that companies use Twitter to disseminate corporate information already disclosed in other channels (e.g., corporate websites). Focusing on nonfinancial disclosure, Lee et al. (2015) show that companies use

⁷ See “SEC Approves Tweeting by Startups to Test Investor Interest.” (2015, June) *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2015-06-26/sec-approves-tweeting-by-startups-to-test-investor-interest> (accessed on January 12, 2019). Please refer to Compliance and Disclosure Interpretations for details. Available at <https://www.sec.gov/divisions/corpfin/guidance/securitiesactrules-interps.htm> (accessed on January 12, 2019).

Table 1
Studies of Companies' Use of Social Media.

Authors	Journal	Research Method	Platform	Findings
Panel A: Motives for Adopting Social Media				
Jung et al. (2018)	<i>The Accounting Review</i>	Archival	Twitter	Companies that are larger, have higher market-to-book ratios, lower leverage ratios, more analyst coverage, spend more on advertising, and hire younger CEOs are more likely to adopt social media platforms. Companies are less likely to disseminate earnings news via social media when the news is bad. Better governed companies are more proactive in adopting Twitter as a complementary corporate disclosure channel.
Yang et al. (2016)	<i>Working paper</i>	Archival	Twitter	Companies use strategic tweeting to mitigate investors' limited attention to a company's news.
Bhagwat and Burch (2016)	<i>Working paper</i>	Archival	Twitter	Companies spending more on advertising and with younger CEOs are more likely to adopt social media platforms. Companies with bad news tend to use Twitter more to mitigate investor uncertainty.
Lee et al. (2015)	<i>Journal of Accounting Research</i>	Archival	Twitter	Voluntary information disclosure in social media is determined by the level of new media adoption and information environment, information asymmetry, and companies' profitability.
Zhang (2015)	<i>Decision Support Systems</i>	Archival	General social media	Adoption of Facebook and Twitter by U.S. public companies varies across industries. The adoption rates of the two social media platforms is highest among retailers and lowest for companies in public administration, which is consistent with the argument that consumer-oriented companies employ social media as a low-cost and effective means for managing consumer relationships.
Zhou et al. (2015)	<i>Journal of Information Systems</i>	Archival	Twitter and Facebook	Technological competence, pressure from clients, characteristics of the mobile environment, and perceived impact are significant antecedents of social media usage.
Schaupp & Belanger (2014)	<i>Journal of Information Systems</i>	Survey	General social media	A higher CSR rating is a strong indicator of an earlier adoption and a faster establishment of online presence (followers).
Lee et al. (2013)	<i>Journal of Business Ethics</i>	Archival	Twitter	Companies tweet more on Twitter if they anticipate that information already disclosed elsewhere (e.g., SEC filings, press release, or conference calls) has a significant positive or negative outcome, but tweet less if the existing information suggests a neutral outcome.
Panel B: Characteristics of Corporate Disclosure in Social Media				
Crowley et al. (2018)	<i>Working paper</i>	Archival	Twitter	Companies are less likely to disseminate quarterly earnings announcements, send fewer earnings announcement tweets, and "rehash" tweets when the news is bad and when the magnitude of the bad news is worse.
Jung et al. (2018)	<i>The Accounting Review</i>	Archival	Twitter	Companies with better environment performance are more likely to join Twitter early and have more tweets about their prosocial behavior.
Huang et al. (2016)	<i>Working Paper</i>	Archival	Twitter	Companies' use of social media during product recalls attenuates the negative price reaction to recall announcements on average, but the attenuation varies with the level of control the firm has over its social media content.
Lee et al. (2015)	<i>Journal of Accounting Research</i>	Archival	Twitter	Tweets posted by a company during the announcement period reduce information asymmetry, and the effect is stronger for companies less visible through business press or financial analyst coverage.
Prokofieva (2015)	<i>Journal of Information Systems</i>	Archival	Twitter	Additional dissemination of corporate-initiated news via Twitter is associated with a reduction in information asymmetry.
Blankespoor et al. (2014)	<i>The Accounting Review</i>	Archival	Twitter	

(continued on next page)

Table 1 (continued)

Authors	Journal	Research Method	Platform	Findings
Panel C: Impact of Corporate Disclosure in Social Media on Capital Markets				
Elliott et al. (2018)	<i>Journal of Accounting Research</i>	Experimental	Twitter	Investors trust a CEO more and are more willing to invest in a company when the CEO communicates corporate news and negative earnings surprises through a personal Twitter account than when the news and surprise is disseminated via a website or from the company's Investor Relations Twitter account or website.
Hales, Moon, and Swenson, (2018)	<i>Accounting, Organizations and Society</i>	Archival	Glassdoor.com	Employee opinions about the companies' business outlook that are publicly shared on Glassdoor.com are useful in predicting growth in key income statement information, transitory reporting items (e.g., restructuring charges), earnings surprises, and management forecast news
Rennekamp and Witz (2018)	<i>Working paper</i>	Experimental	Twitter	Informal language in tweets and high engagement increases investors' willingness to invest in a company by improving assessments of management's competence.
	<i>The Accounting Review</i>	Archival	Twitter	The predictive power of Twitter comments increases with the extent to which they fairly represent the broad customer response to products and brands and when advertising is limited. The predictive power of the valence of Twitter comments is largely attributable to expert comments.
Guggenmos and Bennett (2017)	<i>Working paper</i>	Experimental	General social media	When companies succeed in their strategy to align a company's image with its social media, their investors experience more subjective ease in making judgments and decisions about their investments, which improves the interactions between the company and their current and potential investors.
Lee et al. (2015)	<i>Journal of Accounting Research</i>	Archival	Twitter	Use of social media during product recalls attenuates the negative price reaction to recall announcements on average, but the attenuation varies with the level of control the firm has over its social media content.
Prokofieva (2015)	<i>Journal of Information Systems</i>	Archival	Twitter	Tweets posted by a company during the announcement period reduce information asymmetry, and the effect is stronger for companies less visible in the business press or financial analyst coverage.
Zhou et al. (2015)	<i>Journal of Information Systems</i>	Archival	Twitter and Facebook	7.06% of Facebook messages and 3.45% of Twitter messages are related to corporate disclosures. Nonfinancial disclosure is the fastest-growing disclosure category on Facebook, whereas financial disclosures are rapidly increasing on Twitter.
Blankespoor et al. (2014)	<i>The Accounting Review</i>	Archival	Twitter	Additional dissemination of corporate-initiated news via Twitter is associated with a reduction in information asymmetry.

social media platforms to communicate product recall information to consumers.

As discussed earlier, firms' decision to disclose information is affected by the costs and benefits of disclosure (see Beyers et al. (2010) and Healy and Palepu (2001) for a review). The costs include litigation costs (e.g., Enache, Li, & Riedl, 2018; Kasznik & Lev, 1995; Skinner, 1997) and proprietary costs of disclosure (e.g., Verriccia, 1983,1990) and the benefits include reduced information asymmetry and higher firm valuation (e.g., Beyers et al., 2010; Healy & Palepu, 2001). As the transmission of information in social media is immediate and multi-directional, the costs and benefits of disclosure via social media are an important consideration (Lovejoy & Saxton, 2012; Miller & Skinner, 2015). The studies we review show that companies use social media to strategically disclose corporate information. For example, using archival data, Jung et al. (2018) find that S&P 1500 companies are less likely to use Twitter to disseminate earnings news when the news is bad. In contrast, Crowley et al. (2018) find that companies are more likely to disseminate information about events with significant positive or negative outcomes than they are to disseminate information about events with neutral outcomes. While the two studies differ significantly in sample periods and methodology, the divergence in findings makes it more imperative to conduct further research on this topic.⁸

3.3. Impact of corporate disclosure in social media on capital markets

As social media has become important disclosure channels for corporations, several recent studies have investigated the value-relevance of the information in social media for capital markets. Table 1 Panel C provides a list of the studies reviewed in this section. In the setting of the U.S. capital market, Blankespoor et al. (2014) show that information dissemination on Twitter (e.g., links to press releases) is associated with lower abnormal bid-ask spreads, which is consistent with a reduction in information asymmetry. Similarly, using a sample of Australian companies, Prokofieva (2015) finds that an abnormal bid-ask spread is negatively associated with the number of tweets and retweets posted by a firm during the announcement period. Lee et al. (2015) show that negative market reaction to a product recall is attenuated by the number of tweets issued by the recalling companies that are actively engaged in online dialogue about the issue. This strategy lessens the damage caused by the negative publicity associated with a product recall.

Recent studies also show that the information selectively disclosed in social media by companies can affect stakeholders' perception of the company. Cade's (2018) experimental study demonstrates that managers can mitigate the impact of negative publicity related to potential earnings management (e.g., a Twitter user's criticism of a discretionary accrual adjustment) by strategically redirecting investors' attention to more positive aspects of their financial disclosure, such as tweeting positive highlights from the company's press release (e.g., delivered good first quarter results in the face of a challenging marketplace). Rennekamp and Witz's (2018) experimental study suggests that companies can enhance their connections with investors, improve investors' perceptions of managements' communicative competence, and increase investors' willingness to invest by using more rapport-building informal language in tweets, but only when there is high engagement among users of social media (e.g., favorites and retweets). Guggenmos and Bennett's (2017) experimental study suggests that alignment between a company's image and the social media platforms it adopts can enhance investors' ability to process information and helps them make better investment decisions.

Corporate executives also use social media to disclose corporate information (such as Reed Hastings, CEO of Netflix and Elon Musk, CEO of Tesla). BRANDfog (2012) finds that 82% of survey respondents, employees of Fortune 500 companies, say that they are more likely to trust a company when the CEO uses social media. Consistent with this survey result, Elliott et al. (2018) experimental findings suggest that if a CEO communicates negative corporate news, such as a negative earnings surprise, through a personal Twitter account, it enhances investors' trust in the CEO and their willingness to invest in the company. They also find that a CEO's direct, non-personal responses to Twitter users' questions about the company increase the accuracy of investors' estimates of fundamental values.

To sum up, the above papers generally show that firms with consumer-oriented business, strong technological competence, superior social and governance performance, and young CEOs are more likely to adopt social media for corporate disclosure. Furthermore, corporate disclosure in social media is value-relevant and can reduce information asymmetry.

4. Information produced by non-corporate users and its impact on capital markets

To foster a vibrant online community, social media relies on information produced by all users (Elliott, Gale, & Grant, 2017). With social media, everyone with access to the Internet can publicly broadcast his or her opinion about a company's product (Tang, 2018), disclosure (Trinkle et al., 2015), and stock (Bartov et al., 2018). The information generated by non-corporate users is a significant proportion of the information about companies available in social media and reflects the "wisdom of crowds," which suggest that "the aggregation of information provided by many individuals often results in predictions that are better than those made by any single member of the group, or even experts" (Bartov et al., 2018, p. 28). Table 2 summarizes the studies on this topic that are reviewed in this section.

Empirical research finds that company information generated by non-corporate social media users has strong predictive power for companies' operational outcomes. Tang (2018) focuses on product information generated by non-corporate social media users and shows that aggregated company-level, user-generated product information on Twitter is predictive of company sales. Hales, Moon, and Swenson (2018) document that employee opinions about business outlooks that are publicly shared on Glassdoor.com are useful

⁸ Crowley et al. (2018) explicitly acknowledge that their findings contradict those of Jung et al. (2018) and perform robustness tests to investigate the reasons. However, they are unable to determine the cause of the inconsistent findings.

Table 2
Studies of the Information Produced by Non-corporate Users and its Impact on Capital Markets.

Authors	Journal	Research Method	Platform	Findings
Hales et al. (2018)	<i>Accounting, Organizations and Society</i>	Archival	Glassdoor.com	Employee opinions about companies' business outlooks that are publicly shared on Glassdoor.com are useful in predicting growth in key income statement information, transitory reporting items (e.g., restructuring charges), earnings surprises, and management forecast news
Bartov et al. (2018)	<i>The Accounting Review</i>	Archival	Twitter	The predictive power of Twitter comments increases with the extent to which they fairly represent the broad customer response to products and brands and when advertising is limited. The predictive power of the volume of Twitter comments is dominated by "the wisdom of crowds," whereas the predictive power of the valence of Twitter comments is largely attributable to expert comments.
Curtis et al. (2016)	<i>The Accounting Review</i>	Archival	Twitter	The aggregate opinion of individual tweets successfully predicts a company's forthcoming quarterly earnings and announcement returns.
Baik et al. (2016)	<i>Handbook of Sentiment Analysis in Finance Working paper</i>	Archival	Twitter and Stock Twits	High levels of investor attention are associated with greater sensitivity of earnings announcement returns to earnings surprises. The effect is stronger for companies that beat analysts' forecasts.
Sprenger et al. (2014)	<i>European Financial Management</i>	Archival	Twitter	Twitter is an important platform for local users to share or exchange their private information about local companies. Local tweets provide new value-relevant information about local companies, and contribute substantially to liquidity and price discovery of local companies.
Chen, De, Hu, and Hwang, (2014)	<i>The Review of Financial Studies</i>	Archival	Twitter	Twitter message volume and disagreement are positively associated with trade volume and volatility, respectively.
Yu et al. (2013)	<i>Decision Support Systems Working paper</i>	Archival	Seeking Alpha Blogs, forums, and Twitter	Individual investors' opinions about a company transmitted through Seeking Alpha also predict future stock returns and earnings surprises.
Mao et al. (2012)	<i>Working paper</i>	Archival	Twitter	Social media sentiment has a stronger relationship with company stock performance than conventional media sentiment. The impact of different types of social media varies significantly.
Bollen et al. (2011)	<i>Journal of Computational Science</i>	Archival	Twitter	The daily number of tweets that mention Standard & Poor 500 stocks is significantly associated with the levels, changes, and absolute changes in the S&P 500 index. Aggregate Twitter messages sentiment could significantly improve the accuracy of Dow Jones Industrial Average predictions.

in predicting growth in key income statement data, transitory reporting items (e.g., restructuring charges), earnings surprises, and management forecast news.

Moreover, prior research shows that company information generated by non-corporate social media users has strong predictive power for companies' stock returns. [Bartov et al. \(2018\)](#) demonstrate that the aggregate opinion of individual Twitter messages before an earnings announcement can successfully predict the stock returns of a company's quarterly earnings announcement. [Chen, De, Hu, and Hwang \(2014\)](#) find that individual investors' opinions about a company transmitted through Seeking Alpha also predict future stock returns. Using sentiment analysis techniques, [Yu, Duan, and Cao \(2013\)](#) find a stronger relationship between social media sentiment and stock performance than between conventional media sentiment and stock performance. Relatedly, [Baik, Cao, Choi, and Kim \(2016\)](#) find that the fraction of negative words contained in local tweets about a local company is negatively associated with future stock returns.

Other than investigating the effect of the content of social media messages, [Curtis, Richardson, and Schmardebeck \(2016\)](#) find that high levels of user activity on Twitter and StockTwits are associated with larger earnings response coefficient, whereas low levels of social media activity are associated with significant post earnings-announcement drift. Similarly, [Sprenger, Tumasjan, Sandner, and Welpe \(2014\)](#) find that Twitter message volume and disagreement are positively associated with stock trade volume and volatility, respectively. At the market level, [Bollen et al. \(2011\)](#) show that aggregate Twitter messages sentiment can help predict changes in the Dow Jones Industrial Average. Similarly, [Mao, Wei, Wang, and Liu \(2012\)](#) find that the daily number of tweets that mention S&P 500 stocks is significantly associated with the levels, changes, and absolute changes in the S&P 500 Index.⁹

Overall, the aforementioned studies suggest that information produced and disseminated in social media by non-corporate users have strong predictive power for operational outcomes and stock returns.

5. Credibility of corporate information disseminated in social media

Stakeholders increasingly use information from social media platforms in their decision making ([Kadous, Mercer, & Zhou, 2017](#); [Securities & Exchange Commission \(SEC\), 2014](#)). Corporate information in social media consists of both corporate disclosure ([Zhou et al., 2015](#)) and information generated by non-corporate users. Unsurprisingly, the corporate information has a profound impact on investors' judgement, companies' stock market performance, and investor wealth. The ultimate impact of this information on the corporate information environment depends on its credibility: credible information reduces information asymmetry, whereas biased information might aggravate information asymmetry by misleading information users.

As early as 2012, the SEC's Office of Investor Education and Advocacy issued an investor alert on investment frauds on social media platforms because "U.S. retail investors are increasingly turning to social media ... for information about investing" ([Securities & Exchange Commission \(SEC\), 2014, p. 1](#)). The office updated the alert in 2015 and again in 2017 ([Securities & Exchange Commission \(SEC\), 2015a](#); [Securities & Exchange Commission \(SEC\), 2015b](#); [Securities & Exchange Commission \(SEC\), 2017](#)) following several fraudulent investment schemes that involved using social media to spread false or misleading information about a company or stock recommendation (e.g., [SEC v. Carol McKeown, Daniel F. Ryan, Meadow Vista Financial Corp., and Downshire Capital, Inc.](#) and [SEC v. Wall Street Capital Funding LLC, Philip Cardwell, Roy Campbell, and Aaron Hume](#)). Corporate executives also need to be mindful of the credibility of the information they post on their social media accounts. On August 7, 2018 T's CEO and Chairman, Elon Musk, posted a tweet on his personal Twitter account, "Am considering taking Tesla private at \$420. Funding secured," that caused Tesla's stock price to jump by more than 6% on August 7, 2018, leading to significant market disruption. On September 28, 2018, Elon Musk was charged with securities fraud by the SEC. The SEC complaint alleges that, in truth, Musk had not discussed specific deal terms with any potential financing partners, and he allegedly knew that the potential transaction was uncertain and subject to numerous contingencies (SEC, 2018). The uncertain credibility of information in social media creates both opportunities and challenges for stakeholders seeking to use the information in their decision making. This dilemma has inspired many studies of the double-edged sword effect. The studies reviewed in this section are listed in [Table 3](#).

On the one hand, social media facilitates the formation of a "discipline via dissemination" mechanism ([Dai, Parwada, & Zhang, 2015](#)) by creating and disseminating information generated by non-corporate users. Companies may have incentives to provide biased self-serving information ([Healy & Palepu, 2001](#)), so the rich information provided by non-corporate stakeholders on social media platforms helps users to verify corporate disclosure and to share their judgments with other users through instant feedback (e.g., likes, dislikes, retweets). This wisdom of crowds mechanism helps constrain corporate opportunistic disclosure. For example, [Lyon and Montgomery \(2013\)](#) propose a theoretical framework demonstrating that social media constrains corporate opportunistic disclosure (i.e., greenwashing) as such opportunistic environmental disclosure may backfire if social media users are skeptical about the authenticity of excessive self-promotion. In addition, biased corporate disclosure via social media could give rise to concerns and even criticisms from social media users. Such concerns and criticisms are visible to all social media users and thus increase the pressure on companies to provide credible disclosure. [Lei, Li, and Luo \(2018\)](#) find that questions and concerns raised by non-corporate users on Twitter push companies to improve the transparency of their voluntary corporate political disclosure. Therefore, social media's "discipline via dissemination" helps to mitigate opportunism and opacity in corporate disclosure.

⁹ User-generated information in social media not only affects investors' investment decision, it also benefits companies. Recent research shows that companies receive measurable benefits from user-generated information in social media, such as increased sales ([Du et al., 2015](#)), improved product quality management ([Abrahams, Jiao, Wang, & Fan, 2012](#)), increased return on investment ([Weinberg & Berger, 2011](#)), and lower costs of capital ([Al Guindy, 2016](#)).

Table 3
Studies of the Credibility of Corporate Information on Social Media Platforms.

Authors	Journal	Research Method	Platform	Findings
Lei et al. (2018)	<i>Journal of Information Systems Working Paper</i>	Archival	Twitter	Tweets generated by non-corporate users calling for changes in or expressing dissatisfaction with corporate political activities exert pressure on companies to improve corporate political disclosure transparency.
Kadous et al. (2017)	<i>Journal of Business Ethics</i>	Experimental	StockTwits and Yahoo!Finance stock message boards	Investors' valuation is more significantly influenced by negative opinions about the firm in social media than by positive opinions in social media.
Lyon and Montgomery (2013)	<i>Journal of Business Ethics</i>	Descriptive	General social media	Corporate environmental communications on social media platforms may backfire if citizens and activists feel a company is engaging in excessive self-promotion.

Table 4
Studies on Best Practice Guidelines.

Authors	Journal	Research Method	Platform	Findings
Gade (2018)	<i>Accounting, Organizations and Society</i>	Experimental	Twitter	Managers can respond to critics of potential earnings management (i.e., a Twitter user's critic on a discretionary accrual adjustment) by strategically redirecting investors' attention to the more positive aspects of their financial disclosure in order to attenuate the impact of negative publicity.
Rennekamp and Witz (2018)	<i>Working paper</i>	Experimental	Twitter	Companies may improve their communication with stakeholders by adopting a social media disclosure strategy that is distinct from but complementary to the strategies and images they have established in more traditional disclosure channels.
Lei et al. (2018)	<i>Journal of Information Systems</i>	Archival	Twitter	Companies respond to Twitter users' demand for information on or dissatisfaction with the corporate political activities by enhancing corporate political disclosure transparency.
Marley & Snow (2018)	<i>Journal of Information Systems Working paper</i>	Survey	Twitter	To enhance the efficiency and effectiveness of communications in social media, management must carefully analyze the information desired by different social media groups and target the information to the appropriate audience.
Elliott et al. (2017)	<i>Journal of Information Systems Working paper</i>	Experimental	Social media platforms	The credibility of social media platforms can be inferred from the extent of network oversight, contributor publication experience, and contributor non-ownership status.
Snow and Rasso (2017)	<i>Working paper</i>	Archival	Twitter	Companies should adopt clear policies governing the utilization of social media in corporate disclosure to ensure consistency.
Lee et al. (2015)	<i>Journal of Accounting Research</i>	Archival	Twitter	A recalling company that is actively engaged in online dialogues can lessen the damage caused by the negative publicity of product recall by strategically communicating the product recall information to consumers through tweets.
Alexander & Gentry (2014)	<i>Business Horizon</i>	Descriptive	General	Executives and managers should strategically look at how teams can work jointly to meet investors' and analysts' needs using social media platforms. Legal counsel will be necessary to help ensure that the complex SEC requirements are met.
Lyon and Montgomery (2013)	<i>Journal of Business Ethics</i>	Descriptive	General social media	Corporate environmental communications on social media platforms may backfire if citizens and activists feel a company is engaging in excessive self-promotion.
Hanna et al. (2011)	<i>Business Horizon</i>	Descriptive	General	Companies should pay attention to the consistency of information disclosed on different social media platforms and should coordinate the content, timing, and frequency to maximize synergies.
Kaplan & Heinlein (2010)	<i>Business Horizon</i>	Descriptive	General	It is important that companies choose the right medium for their business objectives and ensure that activities across social media platforms are aligned with each other; companies should be responsive and honest on social media platforms.

On the other hand, social media could become a fertile ground for spreading rumors, because information on social media platforms is not filtered, verified, or regulated, and is provided by users with diverse backgrounds, expertise, and incentives. Moreover, the content, timing, and frequency of information generated by non-corporate users are outside companies' direct control (Mangold & Faulds, 2009; Miller & Skinner, 2015).

Taken together, to maximize the benefit of using information in social media, stakeholders are advised to carefully assess the credibility of the information in social media before using it in their decision making.

6. Practical implications

This review suggests that social media has dramatically changed the corporate information environment. It is imperative for companies and information users to integrate the new disclosure outlets into their information disclosure, information acquisition, and decision making processes. In this section, we review the best practices suggested in academic studies and regulatory reports. The articles are summarized in Table 4. These practices should help companies and information consumers to successfully manage the new information environment.

6.1. Best practice guidelines for companies

The SEC report of its investigation of Netflix indicates that company websites, SEC filings, and news releases must identify the social media outlets used to disseminate material, non-public information (Securities & Exchange Commission (SEC), 2013a). As noted in Alexander and Gentry (2014), social media should supplement rather than substitute for conventional disclosure outlets. Indeed, companies may improve their communication with stakeholders by adopting a social media disclosure strategy that is distinct from but complementary to the strategies and images they have established in more traditional disclosure channels (Rennekamp & Witz, 2018).

In addition, companies are advised to carefully analyze and manage the compliance risk introduced by Reg FD, as corporate communications made through social media channels could constitute selective or exclusionary distribution of information if investors' access to social media is restricted or if investors do not know where to get the latest news (Securities & Exchange Commission (SEC), 2013a; Securities & Exchange Commission (SEC), 2013b). For example, Elon Musk's routine blocking of social media users (e.g., investors, hedge fund managers, and journalists) could potentially be a Reg FD violation (Wieczner, 2018).

Moreover, to ensure consistency and enhance the perceived credibility of its social media disclosure, companies should be selective and cautious when riding the social media wave and should adopt clear policies governing the utilization of social media in corporate disclosure (Snow & Rasso, 2017). Given the variety of social media platforms available to companies, Kaplan and Haenlein (2010) argue that it is important that companies choose the right medium for their business objectives and ensure that activities across social media platforms are aligned with each other. Marley and Snow's (2018) survey-based field study suggests that management can enhance their communication efficiency and effectiveness on social media platforms by carefully considering what information is desired by different social media groups (e.g., non-investors vs. nonprofessional investors) and providing specific audiences with the type of information they desire. Relatedly, Hanna, Rohm, and Crittenden (2011) point out that all social media platforms are connected, thus companies should consider an integrated strategy for their use. Specifically, companies should pay attention to the consistency of information disclosed via different social media platforms and coordinate the content, timing, and frequency in a manner that maximizes the synergies.

Furthermore, Kaplan and Haenlein (2010) suggest that companies be responsive and honest when dealing with information generated by non-corporate users. Companies should closely monitor stakeholders' conversations about the company in social media, actively engage in conversations, and respond quickly to emerging issues so that they can effectively mitigate the impact of negative information (Cade, 2018; Deloitte, 2015; Ernst & Young, 2014; KPMG, 2015; Lee et al., 2015; PwC, 2017). Honesty and transparency can prevent negative opinions from emerging and disseminating across social media platforms (Lei et al., 2018) and also reduce the probability of information disclosure backfiring on the company (Lyon & Montgomery, 2013).

6.2. Best practice guidelines for information consumers

The predictive power of the rich information on social media platforms (e.g., Bartov et al., 2018; Tang, 2018) demonstrates the wisdom of crowds. However, information disseminated in social media (e.g., Twitter) may lack credibility. Self-serving individuals may use social media tools, such as Twitter, to disseminate uninformative, speculative, or even intentionally misleading information (Bartov et al., 2018). Thus, information consumers should exercise caution when making decisions based on information obtained from social media. For example, when considering the information in a tweet, they should carefully assess the extent of network oversight, contributor experience, contributor non-ownership status, and the number of retweets (Elliott et al., 2017).

7. Conclusion and future research opportunities

Over the last decade, social media has become an important means of communication and created a new environment for low-cost, fast, and interactive information disclosure and dissemination. However, social media also has a dark side, including the ability to spread misinformation. Our study provides a timely review of research on the production and dissemination of information in social media and its impact on the corporate information environment. Our review suggests that companies strategically use social

media for both information dissemination and interactive communication purposes. Non-corporate social media users also generate and disseminate a large amount of information about the company that is beyond corporate control, presenting both opportunities and challenges for companies seeking to manage their corporate information environment.

There are many unexplored research opportunities in this new but fast growing area. First, the evidence suggests that companies adopt a variety of mediums (e.g., EDGAR, corporate website, social media, conference calls) to disseminate original information and information that has already been disclosed in another channel. Future studies may examine the relative effectiveness of the various disclosure channels in reducing information asymmetry and how companies strategically use various disclosure outlets.

Second, prior research on the determinants of social media utilization has concentrated on companies' decisions to adopt social media; a few studies have examined why and how individuals use social media in general (e.g., Java, Song, Finin, & Tseng, 2009). However, we know little about the factors that determine the social media activities of non-corporate users (e.g., tweeting and retweeting) and the impact of this activity on the corporate information environment. Future accounting research could investigate the factors that affect non-corporate social media users' decisions to disseminate or disclose information via social media, their responses to other disclosures in social media, and the responses from the companies.

Third, as anecdotal and empirical evidence suggests that investors trade on information disclosed by non-corporate social media users, it is possible that the "rumor mill" characteristic of social media distorts price discovery (Drake et al., 2017; Jia, Redigolo, Shu, & Zhao, 2017). It is thus important for researchers to investigate the effect of social media misinformation on capital markets and various capital market participants' ability to filter out misleading information from social media platforms. Future research could also shed light on whether and how technologies can be utilized to assess the credibility of the information on social media platforms and how the regulatory efforts of the SEC might help improve its credibility.

Fourth, the impact of social media on the corporate disclosure environment may also impact the way that public accountants interact with their clients and collect information about their clients. Specifically, auditors can gain insights into a company by tracking and analyzing information provided by non-corporate social media users rather than relying on management representation. Future research may examine how public accountants can make use of such information to enhance audit effectiveness and efficiency. For example, information aggregated from a client's customers' product complaints on Twitter could be used to corroborate the reasonableness of management's allowance for sales return or employees' comments about a client's management on Glassdoor could facilitate the auditor's assessment of "the tone at the top."

Finally, different reporting regimes may limit or enhance the effect of social media on the informational environment in capital markets (Prokofieva, 2015). Currently, most of the literature on social media is conducted in the U.S. setting. Evidence obtained from the U.S. may not generalize to other countries because of different regulations on the corporate use of social media. For example, while the SEC allows public companies listed on U.S. stock exchanges to use social media to disclose new information, Australian companies are only allowed to use Twitter to disseminate information that is already publicly available in public filings with the Australian Stock Exchange. Future studies in international settings could exploit the variations in regulation to examine how social media shapes the corporate information environment.

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