2022

COVID-19 and CSR disclosure: Evidence from New Zealand

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10.1108/CAFR-03-2022-0017
Bahadar, S., & Zaman, R. (2022). COVID-19 and CSR disclosure: evidence from New Zealand. China Accounting and Finance Review. https://doi.org/10.1108/CAFR-03-2022-0017

COVID-19 and CSR disclosure: evidence from New Zealand

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Received 4 March 2022
Revised 6 March 2022
Accepted 6 March 2022

Abstract

Purpose – Stakeholders' uncertainty about firms' value drives their urge to get information, as well as managerial disclosure choices. In this study, the authors examine whether and how an important source of uncertainty – the recent COVID-19 pandemic's effect on corporate social responsibility (CSR) disclosure – is beyond managerial and stakeholders' control.

Design/methodology/approach – The authors develop a novel construct for daily CSR disclosure by employing computer-aided text analysis (CATA) on the press releases issued by 125 New Zealand Stock Exchange (NZX) listed from 28 February 2020 to 31 December 2020. To capture COVID-19 intensity, the authors use the growth rate of the population-adjusted cumulative sum of confirmed cases in New Zealand on a specific day. To examine the association between the COVID-19 outbreak and companies' CSR disclosure, the authors employed ordinary least squares (OLS) regression by clustering standard error at the firm level.

Findings – The authors find a one standard deviation increase in the COVID-19 outbreak leads to a 28% increase in such disclosures. These results remained robust to a series of sensitivity tests and continue to hold after accounting for potential endogeneity concerns. In the channel analysis, the study demonstrates that the positive relationship between COVID-19 and CSR disclosure is more pronounced in the presence of a well-structured board (i.e. a large, more independent board and with a higher proportion of women on it). In further analysis, the authors find the documented relationship varies over the pandemic's life cycle and is moderated by government stringency response, peer CSR pressure and media coverage.

Originality/value – This paper is the first study that contributes to the scant literature examining the impact of the COVID-19 outbreak on CSR disclosure. Prior research either investigates the relationship of the CSR-stock return during the COVID-19 market crisis or examines the relationship between corporate characteristics including the quality of financial information and the reactions of stock returns during COVID-19. The authors extend such studies by providing empirical evidence that managers respond to COVID-19 by increasing CSR disclosure.

Keywords CSR disclosure, Novel coronavirus, COVID-19, SARS-COV-2, Information uncertainty, Stakeholder-agency theory, Corporate governance, Media coverage

Paper type Research paper

1. Introduction

We examine whether and how the COVID-19 pandemic influences companies' corporate social responsibility (CSR) disclosure. Our study is motivated by the unprecedented effect that this pandemic has inflicted on companies worldwide (Cui, Kent, Kim, & Li, 2021; Spiegel & Tookes, 2021). Many companies are experiencing disastrous financial and business performance, supply chain disruption and other issues, a consequence of snap lockdowns and harsh travel restrictions (Donthu & Gustafsson, 2020). Following the arrival of the pandemic, companies have significantly changed their disclosure practices (Cui *et al.*, 2021; Humphreys & Trotman, 2021). This is due to the role played by managerial perceptions regarding the

China Accounting and Finance Review
Emerald Publishing Limited
e-ISSN: 2307-3055
p-ISSN: 1029-807X
DOI 10.1108/CAFR-03-2022-0017

provision of accounting information which includes both financial and non-financial information (Humphreys & Trotman, 2021). Since managerial perceptions are largely shaped by the external business environment, far greater uncertainty induced by the COVID-19 outbreak may affect companies' CSR disclosure.

The far-reaching negative consequences of pandemic-induced uncertainty for businesses have encouraged scholars to investigate many firms' outcomes and experiences. A large proportion of such studies have predominantly concentrated either on the capital market (Bae, El Ghoul, Gong, & Guedhami, 2021; Ding, Levine, Lin, & Xie, 2021; O'Hara & Zhou, 2021) or mapped theoretical perceptions of how COVID-19 affects (1) firm performance (Donthu & Gustafsson, 2020; Goodell, 2020) and (2) companies' social responsibility activities (He & Harris, 2020) and non-financial reporting (Adams & Abhayawansa, 2021; Hassan, Elamer, Lodh, Roberts, & Nandy, 2021; Humphreys & Trotman, 2021). Others empirically investigated the role of assurance providers on COVID-related disclosure (Albitar, Al-Shaer, & Elmarzouky, 2021), and provided evidence about the role of companies' conservative reporting practices in their performance during the COVID-19 outbreak (Cui *et al.*, 2021). Surprisingly, no empirical research has yet been published on understanding the impact of COVID-19 on CSR disclosure. For this reason, we seek to determine if and to what extent COVID-19 affects firms' CSR disclosure.

We believe that COVID-19, due to its ability to increase greater organisational environmental uncertainty, has important implications for corporate disclosure, and particularly CSR matters. Prior literature confirms the presence of a considerable information asymmetry between managers and firms' external stakeholders (Healy, Hutton, & Palepu, 1999); it also suggests that uncertainty accentuates such information asymmetry (Ghosh & Olsen, 2009). Companies' managers may respond to increased uncertainty by diminishing the information asymmetry between firms and stakeholders. This can be achieved through the provision of voluntary disclosure of information, that is, CSR disclosure. Our arguments are based on the risk mitigation hypothesis of voluntary disclosure which argues that managers make voluntary disclosure, that is, CSR disclosure in response to higher uncertainty (Allegrini & Monteduro, 2018). Consistent with this, Levy (2021) argued that managers upon encountering social and ethical challenges during a pandemic respond proactively to their customers and employees by adopting better communications strategies. COVID-19 has increased the uncertainty to a level that now it is of utmost importance for companies to effectively engage with their stakeholders. Therefore, we expect a significant positive relationship between COVID-19 and CSR disclosure.

Conversely, COVID-19 may negatively impact companies' CSR disclosure due to the voluntary nature of such disclosure. Since CSR disclosure relies mainly on managerial discretion and is affected by the higher uncertainty (Ghosh & Olsen, 2009; Nagar, Schoenfeld, & Wellman, 2019), the COVID-19 pandemic may encourage opportunistic managers to exacerbate information asymmetry between firms and their stakeholders because they want to fulfil their personal goals. Likewise, the adverse negative effect of COVID-19 may lead companies to cut discretionary expenses (Donthu & Gustafsson, 2020). Since the provision of CSR information requires significant costs and resources (Zaman, Nadeem, & Carvajal, 2021), managers may reduce or limit such information disclosure, leading to a negative relationship between COVID-19 and CSR disclosure.

To test these competing arguments, we develop a novel construct for CSR disclosure by employing computer-aided text analysis (CATA) on the press releases by firms from February 28, 2020, to December 31, 2020. To capture COVID-19 intensity, we use the growth rate of the population-adjusted cumulative sum of confirmed cases in New Zealand on a specific day. Our analysis, which provides the first empirical evidence, suggests a higher COVID-19 intensity increases the CSR disclosure. Our results are statistically significant and economically meaningful. We find that a one standard deviation increase in the growth rate of the population-adjusted cumulative sum of confirmed COVID-19 cases leads to a 28% increase in CSR

disclosure. These results remain consistent following the application of a large number of robustness tests: (1) alternative measurement of COVID-19 (i.e. ROLL_COVID), (2) controlling for the omitted variables and (3) after controlling for endogeneity concerns.

Since our baseline results are based on the hypothesis that managers respond to increasing COVID-19 uncertainty by lowering the information asymmetry through CSR disclosure, we need to test this underlying contention. To do this, we use board monitoring as a proxy to capture information asymmetry and test whether the documented positive relationship between COVID-19 and CSR disclosure is more pronounced in companies with higher board monitoring (i.e. lower information asymmetry). Our finding suggests that effective monitoring (less information asymmetry) demonstrated by a well-structured board (a large, more independent board, and with a large proportion of women on it) significantly enhances the positive relationship between $COVID_{NZ,t}$ and CSR disclosure. In an additional analysis, we invoke the COVID-19 life cycle to observe whether the COVID-19 and CSR disclosure varies across the pandemic's life cycle. Our findings suggest there is a significant positive association between them for the outbreak and recovery periods. However, we fail to find any association between COVID-19 and CSR disclosure during the incubation period (initial 14 days of discovery of first COVID-19 case). These findings corroborate our baseline finding that managers respond to higher uncertainty by increasing voluntary information, that is, CSR disclosure. In further analysis, we find evidence that external stakeholders influence the documented positive relationship between $COVID_{NZ,t}$ and CSR disclosure. More specifically, our findings suggest that the documented relationship is positively moderated by the stringency of government response, peers' CSR performance and higher media coverage of the COVID-19 outbreak.

Our study contributes to three strands in the literature. First, the study contributes to voluntary disclosure in general and CSR disclosure in particular, by constructing a novel construct for the latter through CATA on 125 New Zealand stock exchange (NZX) listed companies' press releases during the COVID-19 outbreak. Prior studies rely on the annual CSR rating from proprietors' databases such as Thomson Reuters EIKON, Bloomberg or KLD to capture corporate social performance including CSR disclosure (Cho, Michelon, Patten, & Roberts, 2015; Tsang, Hu, & Li, 2020; Zaman, Jain, Samara, & Jamali, 2020). However, these approaches have two limitations. Firstly, the annual CSR ratings fail to capture daily corporate responses. Hence, these ratings lack timeliness, an important qualitative characteristic in accounting information disclosure literature, so there is the potential to distort the underlying relationship. Secondly, the proprietary nature of CSR ratings limits the dissemination of CSR research, particularly to markets/economies where researchers (developing or underdeveloping countries) have limited resources to the relevant databases (Zaman *et al.*, 2020). Therefore, the CSR disclosure measurement approach (textual analysis of corporate press releases) adopted in this study can be used to overcome these limitations.

Second, to the best of our knowledge, this paper is the first study that contributes to the scant literature examining the impact of the COVID-19 outbreak on CSR disclosure. Prior research either investigates the relationship of the CSR-stock return during the COVID-19 market crisis (Bae *et al.*, 2021; Broadstock, Chan, Cheng, & Wang, 2021) or examines the relationship between corporate characteristics including the quality of financial information and the reactions of stock returns during COVID-19 (Cui *et al.*, 2021; Ding *et al.*, 2021). We extend such studies by providing empirical evidence that managers respond to COVID-19 by increasing CSR disclosure.

Thirdly, we also contribute to the corporate governance literature by providing evidence that board-level characteristics positively contribute to the COVID-19 and CSR nexus. Finally, despite the theoretical evidence that external stakeholders do matter for businesses to mitigate the adverse effect of the pandemic, empirical evidence remains scant. We add to such literature by empirically demonstrating that powerful stakeholders, that is, stringency

of government response, peers' CSR performance and higher media coverage encourage companies to provide higher CSR disclosure. The remainder of the paper is organised as follows. We begin by examining the literature that is relevant to our study and by presenting our hypotheses in Section 2. In Section 3, we describe our methods, including data, measures and research methodology. The empirical results and discussion are presented in Section 4, and our overall conclusions are presented in Section 5.

2. Literature review and hypothesis development

2.1 CSR disclosure

CSR disclosure has received a considerable amount of attention from academic literature. Studies on determinants of CSR disclosure can be grouped into three categories. Firstly, a majority of the literature has examined the role of corporate governance characteristics such as a board of directors' features including board committee's composition, managerial characteristics and ownership structure on firms CSR disclosure practices (Jain & Jamali, 2016; Zaman *et al.*, 2020). Despite being inconclusive, a predominant view suggests that a well-developed corporate governance structure diminishes agency conflict by increasing CSR disclosure (Farooq, Zaman, Sarraj, & Khalid, 2021; Jain & Jamali, 2016). The second stream of literature explored the impact of a firm's characteristics, particularly the capital structure and financial health on CSR disclosure practices (Farooq *et al.*, 2021; Hahn & Kühnen, 2013). While the results of capital structure and CSR disclosure remain mixed, firm size, market capitalisation and firm profitability are documented as significant determinants of CSR disclosure (Dienes, Sassen, & Fischer, 2016; Hahn & Kühnen, 2013). Finally, a handful of studies have investigated the role of country characteristics such as national culture (Khlif, Hussainey, & Achek, 2015; Luo & Tang, 2016), regulations/legislation stringency (Mateo-Márquez, González-González, & Zamora-Ramírez, 2020) and religion (Chantziaras, Dedoulis, Grougiou, & Leventis, 2020) in promoting CSR disclosure. Although these studies have enhanced our understanding of the antecedents of CSR disclosure, they fail to capture firms' CSR disclosure heterogeneity in times of crisis. Thus, our study is intended to address this gap in the literature.

2.2 Theoretical framing and hypotheses development

Prior literature has largely examined the antecedents of CSR disclosure by invoking agency theory (Hahn & Kühnen, 2013; Jain & Jamali, 2016). Agency theory sheds light on the relationship between agent (management) and principal (shareholders) (Jensen & Meckling, 1976) and provides insights that effective disclosure is one mechanism through which companies can manage principal-agent conflicts (Farooq, Zaman, & Nadeem, 2021). More recently, critics argue that the agency lens predominantly focuses on conflicts between capital providers and agents, and offers solutions for how to resolve such tensions (Aguilera & Jackson, 2010; Zaman, Farooq, Khalid, & Mahmood, 2021). However, it ignores the interests of other parties, that is, stakeholders who interact with the company and who can be affected by the firm's policies and decisions (Freeman, 1984). To resolve such criticism, Hill and Jones (1992) propose the idea of stakeholder-agency theory. Stakeholder-agency theory in contrast to agency theory put the organisational stakeholders at the centre of attention (Jain & Zaman, 2020). This theory confirms the presence of conflict between multiple principals (stakeholders) and agents (managers) that arises due to information asymmetry issues, and suggests information disclosure as one of the mechanisms to address such conflicts (Zaman *et al.*, 2021). This lens has been adopted by some recent scholarship, particularly in studies that examine the impact of corporate/managerial characteristics on CSR (Gerged, 2021; Zaman *et al.*, 2021). The COVID-19 outbreak has elevated business uncertainty to a level that it becomes more difficult for stakeholders to access the corporate information

(Li, Liu, Mai, & Zhang, 2021). Such limited access may increase information asymmetry between multiple principals (stakeholders) and agents (managers), resulting in more conflicts between stakeholders. Therefore, we believe the stakeholder-agency lens is an appropriate one to examine the impact of COVID-19 on CSR disclosure.

COVID-19 has created a significant challenge for businesses. Disruption of supplies, diminishing profitability and declines in market value have significantly raised questions on companies' ability to keep operating (Humphreys & Trotman, 2021). The ambiguity regarding a company's going concern exacerbates information asymmetries between managers and stakeholders. Since companies are bound up in the nexus of explicit contractual obligations (compensation contracts and debt contracts) and implicit contractual obligations to stakeholders such as customers, employees' welfare and environmental protection (Freeman, 1984), they may use CSR disclosure to signal their commitment to honour their contractual obligations, thereby reducing information asymmetries. For instance, Nagar *et al.* (2019) in their findings noted that managers respond to uncertainty by increasing their non-financial disclosure. Likewise, Krause, Sellhorn, and Ahmed (2017) have examined the impact of extreme uncertainty on corporate forward-looking disclosure. Their finding suggests that extreme uncertainty increases the extent of this disclosure. The outcomes of these studies imply that companies use non-financial disclosure to transmit positive signals to stakeholders if they encounter higher uncertainty. In turn, this disclosure not only increases stakeholders' confidence about the firm's operational abilities but also consolidates their ability to effectively deal with adverse outcomes of exogenous shocks. Consistent with this, Albuquerque, Koskinen, Yang, and Zhang (2020) show that firms with higher ESG ratings displayed better resilience than their counterparts during the recent pandemic. We argue that these advantages will encourage company managers to increase CSR disclosure in response to COVID-19, leading to the study's main hypothesis.

H1a. COVID-19 outbreak is positively associated with CSR disclosure, ceteris paribus.

Conversely, the higher uncertainty caused by this pandemic may increase the probability of managers seeking to pursue their own agendas at the expense of stakeholders and, in certain circumstances, engaging in acts of corporate malpractice that entice them to limit CSR disclosure. For instance, Lassoued and Khanchel (2021), examining the extent of earning management practices during the pandemic, reveal that executives manage company earnings during the pandemic to offset the reported losses. Further, the reluctance of companies' disclosure can be observed in a recent series of fines imposed by the Australian Securities and Investments Commission (ASIC) on ten companies for failing to comply with their obligations to lodge financial reports [1]. Another way in which the COVID-19 outbreak can limit CSR disclosure is the costs associated with such disclosure. This is because it has adversely affected companies' cash flows, forcing them to cut discretionary expenses (Banerjee, Illes, Kharroubi, & Garralda, 2020; Didier, Huneeus, Larrain, & Schmukler, 2021) Since CSR disclosure is voluntary and its provision requires significant resources, managers may reduce or limit such information disclosure, leading to a compromised relationship between COVID-19 and CSR disclosure. Based on the forgoing discussion, we formulate the following competing hypothesis:

H1b. COVID-19 outbreak is negatively associated with CSR disclosure, ceteris paribus.

3. Data and method

3.1 Dependent variable: CSR disclosure

To capture daily CSR disclosure, we relied on companies' press releases and an analysis of the relevant texts. Following Bushee, Core, Guay, and Hamm (2010); Bushee and Miller (2012);

Core, Guay, and Larcker (2008); and Tsileponis, Stathopoulos, and Walker (2020), we first extracted the corporate press releases using the PR Newswire and Business Wire section of Factiva's category "Press Release Wires" for all NZX listed companies. However, following Ahern and Sosyura (2014), we eliminate press releases with fewer than 50 words. We require the name or alternative names of the NZX listed firms (e.g. "Chorus Limited", "Chorus Ltd" or "Chorus") to appear in each release's headline. Although almost all press releases contain the issuing firm's name in the headline, this procedure is not sufficient to ensure that the NZX listed firms issued all corporate disclosures. In line with Soltes (2010), we take advantage of the fact that corporate press releases include a separate field (the CT field) with the company's contact information at the bottom of each press release. We require each company's name, alternative names or official website to be mentioned within this contact field. Failure to take each disclosure's contact information into account would introduce bias and would lead to significant misclassification (Soltes, 2010). We construct our sample using the 125 NZX listed firms from 28 February 2020 to 31 December 2020. We begin by collecting 1,034 corporate press releases from the Factiva database. We drop 37 press releases that have the identical date of publication, Factiva company identifier, headline, author name, number of words and source code. In total, the sample includes 997 corporate press releases.

To measure the CSR disclosure, we applied CATA to gauge the extent to which the press releases, issued by NZX listed firms during the ongoing COVID-19 crisis, emphasised the multidimensional CSR linguistic themes, as devised by Pencle and Mălăescu (2016). We followed the multistep process suggested by Payne, Brigham, Broberg, Moss, and Short (2011) and Short, Broberg, Cogliser, and Brigham (2010) in developing our dictionary by first using a deductive, theory-based process in which we used The Synonym Finder (Rodale, 1978) to create an initial list of words representing CSR themes present in the literature. This deductive process was followed by an inductive process in which corporate press releases were systematically examined via "CAT Scanner" software (McKenny, Short, & Newman, 2012). "CAT Scanner" generated a list of over 39,000 unique words that appeared in our sample of corporate press releases at least three times. Similar to Moss, Renko, Block, and Meyskens (2018), to avoid confounding effects, we scanned this list and kept only those words that were consistent with CSR themes and were not already contained in the list of deductive words. We sent this list of inductive words to two independent scholars familiar with the CSR literature, who scanned the list and gave their feedback on the appropriateness or inappropriateness of the words on the inductive list.

To assess the inter-rater reliability of the independent judges, we calculated the intraclass correlation coefficient (ICC) of their assessment (Bliese, 2000). As per the cut-offs and nomenclature provided in the literature for inductive coding, the ICC score of 0.60 indicates that reliability is good (Cicchetti, 1994; Hallgren, 2012). We then combined the deductively and inductively derived words into a dictionary containing a final list of 115 words representing CSR themes (see Table 1). Finally, we used the Linguistic Inquiry and Word Count (LIWC) software (Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007) to analyse the corporate press releases. LIWC output contains standardised word counts that control for the length of press releases. Specifically, LIWC counts the total number of dictionary words, then divides them by the total number of words into the complete press releases and scales the value to a standard per 100 words. Scaling is necessary since longer press releases could naturally contain more instances of CSR-related words. We coded the LIWC output emphasising CSR-related words as our variable for "CSR disclosure".

3.2 Independent variable: COVID-19 outbreak

We obtain data on COVID-19 cases from Coronavirus COVID-19 Global Cases Database, which is managed by Dong, Du, and Gardner (2020) at the Center for Systems Science and

Engineering (CSSE) at Johns Hopkins University (JHU). The database is organised as an interactive web-based dashboard, which tracks the number of new COVID-19 cases around the world in real time. The JHU team collects daily worldwide data for more than 180 economies, dating back to 22 January 2020. The team assembles information from government reports, local media and online news services, social media platforms and direct communication with other information sources. It then confirms the case numbers with international health authorities, such as the World Health Organization (WHO), and local health departments, for example the respective Centers for Disease Control and Prevention.

The case data reported through the CSSE's dashboard include (1) the number of new confirmed cases, (2) the number of deaths and (3) the number of recoveries. To measure the COVID-19 outbreak in New Zealand, we follow Ding *et al.* (2021) and compute NZCOVID: the growth rate of the population-adjusted cumulative sum of confirmed cases in New Zealand on a specific day. More specifically, we calculate NZCOVID as follows.

$$COVID_{NZ,t} = ln\left[\frac{\left(1+\frac{Confirmed\ Cases_{NZ,t}}{Population_{NZ,t}}\right)}{\left(1+\frac{Confirmed\ Cases_{NZ,\,t-1}}{Population_{NZ,t-1}}\right)}\right] \tag{1}$$

To smooth out short-term fluctuation and highlight long-term trends and/or cycles in the COVID-19 confirmed cases in New Zealand, we measure another proxy by taking the 5-day moving average of the first proxy of COVID-19 outbreak ($COVID_{NZ,t}$).

$$ROLL\_COVID_{NZ,t} = \frac{COVID_{NZ,t-4} + COVID_{NZ,t-3} + COVID_{NZ,t-2} + COVID_{NZ,t-1} + COVID_{NZ,t}}{5} \tag{2}$$

where $Confirmed\ Cases_{NZ,t}$ represents the COVID-19 cumulative confirmed cases in New Zealand on day t, $Population_{NZ,t}$ is for the population of New Zealand, $COVID_{NZ,t}$ denotes the population-adjusted growth rate of COVID-19 cumulative confirmed cases in New Zealand on

Dimensions covered	Consolidated list of words (115 words)
Employee, Environment, Human Rights and Social & Community	accept*, accountab*, assur*, attribute*, audit*, aware*, benefit*, biodiverse*, board, bonus, build*, carbon, care, charit*, clean*, climate, CO2, code, collect*, commit*, commun*, concern, conserve*, constitution, contribut*, design, develop*, disclos*, dispos*, divers*, donat*, duty, educat*, emission, employ*, empower*, engag*, environment*, equal*, equit*, ESG, ethic*, facilit*, fair*, female, food*, fossil, free*, gender, govern*, health*, help*, human, improve*, indigen*, innovate*, insur*, involve*, lead*, medic*, payroll, peer, pension, people, perform*, person*, pledg*, pollut*, poor, power*, preserv*, prevent*, product*, promot*, public*, quality, recogni*, recover*, redeem*, reduc*, regulat*, relati*, reliab*, renew*, research*, reserve*, respect*, responsib*, right, safe*, satisfy*, science, scientifi*, social*, societ*, sponsor*, steward*, suitab*, sustain*, talent*, team, threat*, transpar*, trust*, unemploy*, union, unsafe, volunt*, vulner*, wage, waste, weather, welfare, wellness, work*

Note(s): Table 1 presents the consolidated list of CSR disclosure words derived after employing deductive and inductive approaches

Table 1. Dictionary of CSR disclosure words

day t and $ROLL\_COVID_{NZ,t}$ stands for the 5-day moving average of the population-adjusted growth rate of COVID-19 cumulative confirmed cases in New Zealand on day t.

3.3 Control variables

We control for several factors that potentially affect CSR disclosure in times of crisis. Prior literature revealed that high stock liquidity increases information transparency and disclosure and reduces managerial opportunistic behaviour (Frino, Palumbo, Capalbo, Gerace, & Mollica, 2013; Gao, Dong, Ni, & Fu, 2016). Therefore, we expect a significant positive association between stock liquidity and firm CSR disclosure. To control for stock liquidity, we include stock price range (*RANGE*) and Amihud ratio of illiquidity (*ILLIQ*) spread- and volume-based measures of liquidity, respectively, in the regression model. Return on assets, a proxy for profitability (*PRFO*), is part of the regression, as prior studies show that firms performing better financially have better CSR disclosure (Dhaliwal, Li, Tsang, & Yang, 2011; Dhaliwal, Radhakrishnan, Tsang, & Yang, 2012; Hahn & Kühnen, 2013). Since less risky firms are more likely to provide higher information disclosure (Adams & Hardwick, 1998; Orlitzky & Benjamin, 2001), we added control for firm leverage (LEV) and betas on Carhart four-factor model (such as market, size, value and momentum) in our regression. Firm size is another essential factor that can affect strategic motivation, thereby having a positive effect on CSR disclosure (Dhaliwal, Li, Tsang, & Yang, 2014; Dhaliwal *et al.*, 2012; Farooq *et al.*, 2021). Larger firms tend to have a bigger social impact, given the scale of their activities (Cowen, Ferreri, & Parker, 1987) and smaller firms may face fewer pressures or gain little recognition from CSR, given their comparatively lower visibility (Cahan, Chen, Chen, & Nguyen, 2015; Udayasankar, 2008). Since mature firms are more involved in CSR disclosure than younger firms, we controlled firm age (*AGE*) (Deegan, 2002; Dhaliwal *et al.*, 2012). Firms establish their good public image by having operated for a long time, and this entrenches their social responsibility disclosure practices.

3.4 Model specification

To investigate the impacts of the COVID-19 outbreak on the firms' CSR disclosure in New Zealand, we construct the following baseline empirical model and employ ordinary least squares (OLS) for its estimation.

$$CSR\ Disclosure_{i,t} = \beta_0 + \beta_1 COVID_{NZ,t} + \sum_{j=1}^{n} \varphi_j Controls_{i,t} + Industry\ fixed\ effect + \varepsilon_{i,t} \quad (3)$$

Where $CSR\ Disclosure_{i,t}$ represents the extent to which NZX listed firms engage in CSR disclosure from 01 January 2020 to 15 May 2020; $COVID_{NZ,t}$ denotes the population-adjusted growth rate of COVID-19 cumulative confirmed cases in New Zealand on day t; $Controls_{i,t}$ is for all the control variables such as $RANGE_{i,t}$, $ILLIQ_{i,t}$, $PROF_{i,t}$, $LEV_{i,t}$, $SIZE_{i,t}$, $AGE_{j,t}$, $BETA^{MKT}_{NZ,t}$, $BETA^{SMB}_{NZ,t}$, $BETA^{HML}_{NZ,t}$ and $BETA^{MOM}_{NZ,t}$. We include industry fixed effects and correct standard error at the firm level. Industry fixed effects help account for all time-invariant industry-level factors that might be jointly related to both dependent and independent variables. Detailed descriptions of the variables are found in Appendix.

4. Empirical results

4.1 Descriptive statistics and correlation matrix

Table 2 shows the study's descriptive statistics. The results for CSR disclosure indicate that the number of CSR-related words varies from 0 to 49 words per 100 words in corporate press

Variables	N	Mean	Std. dev	Min	Max
$CSR\ Disclosure_{i,t}$	6,375	6.516	11.119	0	49
$COVID_{NZ,t}$	6,375	14.552	28.550	0	89
$RANGE_{i,t}$	6,375	0.121	0.274	0	6.05
$ILLIQ_{i,t}$	6,375	9.806	122.858	0	5331.9
$PROF_{i,t}$	6,375	0.03	0.13	−0.62	0.29
$LEV_{i,t}$	6,375	1.21	1.40	0	11.76
$SIZE_{i,t}$	6,375	11.26	1.63	0	15.41
$AGE_{j,t}$	6,375	34.664	41.208	0	238
$BETA_{NZ,t}^{MKT}$	6,375	−0.12	0.719	−1.291	3.517
$BETA_{NZ,t}^{SMB}$	6,375	1.974	1.359	−2.142	10.125
$BETA_{NZ,t}^{HML}$	6,375	−0.71	0.503	−1.735	2.498
$BETA_{NZ,t}^{MOM}$	6,375	0.092	0.505	−1.855	1.91

Table 2. Descriptive statistics of all variables

releases during the COVID-19 pandemic and on average each press release contains 6.516 CSR-related words. The confirmed cases of COVID-19 in New Zealand change from a minimum of 0 to a maximum of 85 during the study sample, with a mean value of 14.55 confirmed cases per day. It is relatively lower compared to the average confirmed cases in the rest of the world, which is 35,613 cases per day. It explicitly reflects the stringent and effective NZ government policies to contain the community spread of the coronavirus. From the control variables outset, the daily variation in stock liquidity, as proxied by RANGE (Min = 0, Max = 6.05) and ILLIQ (Min = 0, Max = 5331.9), is significantly high. The betas on market (Min = −1.291, Max = 3.517), size (Min = −2.142, Max = 10.125), value (Min = −1.735, Max = 2.498) and momentum (Min = 0, Max = 6.05) factors also show high variation. The higher betas indicate that investors seek a higher premium for the risks associated with the firms' stock value. Other control variables related to firms' financial performance are consistent with prior literature (Koerniadi, Krishnamurti, & Tourani-Rad, 2014).

Table 3 reports the correlation coefficient between study variables. The results show the firm's CSR disclosure is significantly correlated with the COVID-19 outbreak, providing initial support for hypothesis H1a. For all other pairs of variables, all values of the correlation coefficient are of the expected sign and much smaller in magnitude than the required threshold of 0.80. Confirmed here is the absence of multicollinearity in our sample settings.

4.2 Baseline results

Table 4 presents the baseline results for Equation (3). Column (1) reports the results for the relationship between COVID-19 outbreak and CSR disclosure using the main proxy of the dependent variable, that is, *CSR disclosure index*. Meanwhile, Column (2) presents the results on the relationship between COVID-19 outbreak and CSR disclosure for alternative proxy of disclosure, that is, ROLL_CSR disclosure. The results in Table 3 strongly support our hypothesis H1a that the COVID-19 outbreak leads to a higher CSR disclosure. Specifically, the coefficient estimates on $COVID_{NZ,t}$ in column (1) and column (2) are positive ($\beta = 1.386$ and $\beta = 1.379$) and statistically significant at the 1% level for both proxies of CSR disclosure. These results are consistent with our hypothesis and demonstrate that managers use CSR disclosure as their response to the spreading COVID-19 outbreak. Our results are economically significant. A one standard deviation increase in the COVID-19 outbreak increases the CSR disclosure in New Zealand by 28% [2]. Taken together, our results complement the stakeholder-agency theory that managers during a crisis rely on CSR disclosure as a mechanism to reduce information asymmetry between firms and their stakeholders.

Table 3.
Correlation matrix of all variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$CSR\ Disclosure_{i,t}$	1.00											
$COVID_{NZ,t}$	0.20*	1.00										
$RANGE_{i,t}$	−0.01	−0.09*	1.00									
$ILLIQ_{i,t}$	−0.02	−0.05*	−0.03	1.00								
$PROF_{i,t}$	0.01	0.00	0.13*	−0.01	1.00							
$LEV_{i,t}$	−0.01	0.00	0.17*	−0.07*	0.12*	1.00						
$SIZE_{i,t}$	0.00	0.00	−0.04*	0.03	0.14*	−0.61*	1.00					
$AGE_{j,t}$	0.03	0.00	0.10*	0.00	0.33*	0.13*	0.05*	1.00				
$BETA_{NZ,t}^{MKT}$	−0.07*	0.00	0.13*	−0.01	0.10*	0.04*	−0.12*	−0.11*	1.00			
$BETA_{NZ,t}^{SMB}$	−0.01	0.00	0.11*	0.04*	0.04*	0.01	−0.02	0.02	−0.03	1.00		
$BETA_{NZ,t}^{HML}$	−0.03	0.00	−0.12*	0.05*	0.01	0.10*	0.00	0.02	−0.04*	−0.09*	1.00	
$BETA_{NZ,t}^{MOM}$	−0.01	0.00	−0.07*	0.03	0.00	0.14*	−0.01	0.10*	−0.20*	0.50*	0.46*	1.00

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Panel 4A: COVID-19 outbreak and CSR disclosure – baseline result

Explanatory variables	(1) CSR disclosure	(3) ROLL_CSR
$COVID_{NZ,t}$	1.386*** (0.023)	1.379*** (0.022)
$RANGE_{i,t}$	−0.376*** (0.081)	−0.370*** (0.077)
$ILLIQ_{i,t}$	−0.425*** (0.057)	−0.411*** (0.055)
$PROF_{i,t}$	0.163* (0.098)	0.156* (0.094)
$LEV_{i,t}$	0.041 (0.04)	0.041 (0.038)
$SIZE_{i,t}$	1.133*** (0.187)	1.080*** (0.179)
$AGE_{j,t}$	0.503*** (0.072)	0.481*** (0.069)
$BETA_{NZ,t}^{MKT}$	−0.059 (0.041)	−0.061 (0.039)
$BETA_{NZ,t}^{SMB}$	−0.353*** (0.110)	−0.324*** (0.106)
$BETA_{NZ,t}^{HML}$	−0.190*** (0.067)	−0.171*** (0.066)
$BETA_{NZ,t}^{MOM}$	−0.097** (0.041)	−0.094** (0.039)
$CONSTANT_{i,t}$	4.715*** (0.727)	4.164*** (0.695)
Industry effect	Yes	Yes
Observations	2,672	2,672
$F-stat\ (p-value)$	0.000	0.000
Adj R^2	0.542	0.559

Panel 4B: Difference between the CSR disclosure during and pre-pandemic period

Variable	During pandemic	Mean Pre-pandemic (2015–2019)	Difference of means	Std. error	*T*-stat	*P*-value
CSR disclosure	6.5156	3.9508	2.5648	0.1397	39.5530	0.0000

Note(s): Table 4 reports the baseline results for the relationship between COVID-19 outbreak and CSR disclosure. Columns (1) and (2) of Panel 4A present the results for two alternative proxies of CSR disclosure, and Panel 4B reports the results of paired samples *t*-test to check the difference between the average CSR disclosure during and pre-pandemic period. The robust standard errors are reported in the parentheses. And "***", "**" and "*" represent the significance at 1, 5 and 10% levels, respectively. The variables are defined as in Appendix

Table 4. COVID-19 outbreak and CSR disclosure – baseline result

At the outset of our control variables, we found that low illiquidity (RANGE and ILLIQ) means high liquidity, high profitability (PROF), large firms (SIZE), old firms (AGE) and less risky firms (BETAs, estimated on size, value and momentum factor) are significantly associated with CSR disclosure. Moreover, our findings show that financial constraints (LEV) and the market risk factor (BETA) have no significant relationship with CSR disclosure. Notably, the results for our control variables largely remain consistent with the prior literature (Dienes *et al.*, 2016; Hahn & Kühnen, 2013; Nagar *et al.*, 2019).

We further confirm that managers discloses higher CSR in response to higher uncertainty by undertaking the paired samples *t*-test. We follow Branco and Rodrigues (2008) and Haniffa and Cooke (2005) to examine whether the level of $CSR\ disclosure_{during\ pandamic}$ is greater than the level of $CSR\ disclosure_{pre-pandamic}$. We employed similar CATA approach to capture $CSR\ disclosure_{pre-pandamic}$ (see Section 3.1) for the period 2015–2019. The results reported in Table A1 show a significant mean difference between $CSR\ disclosure_{pre-pandamic}$ and $CSR\ disclosure_{during\ pandamic}$ at 1% level of significance. More specifically, we found $CSR\ disclosure_{during\ pandamic}$ mean value is significantly higher than the mean value of $CSR\ disclosure_{pre-pandamic}$. We believe these results are in line with our baseline arguments that managers respond to higher uncertainty by providing more CSR disclosure.

4.3 Robustness checks

In this section, we conduct several robustness tests to validate our baseline findings. Specifically, we consider whether our results remain robust by (1) nonlinearity test, (2) alternative proxy for COVID-19 outbreak and (3) after addressing endogeneity concerns. The presence of nonlinearity between the COVID-19 outbreak and CSR disclosure can make our estimated results spurious. To address the nonlinearity concern, we introduce a squared term of the COVID-19 variable into the regression equations. Column (1) in Table 5 reveals that the coefficient of the squared terms of the COVID-19 variable is insignificant, indicating that the relationship between COVID-19 outbreak and CSR disclosure is linear, providing additional validity to our main findings. To test whether our main finding is robust to the choice of COVID-19 outbreak measure, we re-estimate our baseline model of Equation (3) using an alternative proxy for the COVID-19 outbreak, that is, 5-day rolling average of COVID-19 in New Zealand. Column (2) in Table 5 presents the results. Consistent with our main finding, the coefficient on the alternate proxy of the COVID-19 outbreak is positive and significant at the 1% level.

The potential endogeneity in the model could result in spurious estimates, and the three possible sources of endogeneity that could affect our results to different degrees are (1) simultaneity, (2) measurement error and (3) omitted variables (Roberts & Whited, 2013). First, simultaneity or reverse causality could not be the source of endogeneity in the case of CSR disclosure-COVID relation, since past, current and future confirmed cases of COVID-19 are exogenous to the firms' CSR disclosure. Therefore, firms' CSR disclosure could not possibly have a causal effect on the COVID-19 outbreak. Second, measurement error is a possibility

	Dependent variable: CSR disclosure		
	(1)	(2)	(3)
Explanatory variables	Nonlinearity	Alternate independent variable: ROLL_COVID	Instrumental variable estimator: 2SLS
$COVID_{NZ,t}$	0.796*** (0.043)	1.647*** (0.033)	1.553*** (0.030)
$SQ\_COVID_{NZ,t}$	0.129*** (0.011)		
$RANGE_{i,t}$	−0.225*** (0.082)	−0.370*** (0.082)	−0.338*** (0.081)
$ILLIQ_{i,t}$	−0.366*** (0.057)	−0.404*** (0.054)	−0.396*** (0.053)
$PROF_{i,t}$	−0.185* (0.095)	−0.116 (0.089)	−0.132 (0.088)
$LEV_{i,t}$	0.029 (0.039)	0.049 (0.032)	0.044 (0.031)
$SIZE_{i,t}$	1.119*** (0.187)	1.105*** (0.143)	1.119*** (0.141)
$AGE_{i,t}$	0.461*** (0.073)	0.492*** (0.074)	0.493*** (0.073)
$BETA_{NZ,t}^{MKT}$	−0.057 (0.041)	−0.058 (0.042)	−0.060 (0.042)
$BETA_{NZ,t}^{SMB}$	−0.340*** (0.107)	−0.356*** (0.116)	−0.348*** (0.115)
$BETA_{NZ,t}^{HML}$	0.178*** (0.065)	0.186** (0.092)	0.181** (0.091)
$BETA_{NZ,t}^{MOM}$	−0.100** (0.040)	−0.099** (0.041)	−0.098** (0.040)
$CONSTANT_{i,t}$	5.045*** (0.718)	3.323*** (0.69)	4.180*** (0.678)
Industry effect	Yes	Yes	Yes
Observations	2,672	2,672	2,672
$F-stat\ (p-value)$	0.000	0.000	0.000
Adj R^2	0.557	0.521	0.535

Note(s): Table 5 reports the results of the robustness checks in columns (1), (2) and (3). Column (1) presents the results for the test examining the nonlinear functional form of the model. In column (2), we check the consistency of baseline results using a 5-day rolling average of COVID (an alternate IV). We also confirm the robustness of baseline results by re-estimating the model using alternate estimator two-stage least square (2SLS) in column (3). The robust standard errors are reported in the parentheses. And "***", "**" and "*" represent the significance at 1, 5 and 10% levels, respectively. The variables are defined as in Appendix

Table 5. COVID-19 outbreak and CSR disclosure – robustness checks

because we employed textual analysis on corporate press releases to measure the CSR disclosure, which could reflect subjective assessments of CSR disclosure and is one of the potential limitations of this study. Third, with reference to the omitted variable concern, though we have included several control variables for CSR disclosure as identified in the prior studies, we may have omitted some potential control variables. Therefore, to address the potential omitted variable bias, we re-estimate Equation (3) by introducing some additional control variables such a: (1) earnings per share, (2) standard deviation of earning per share, (3) market-to-book ratio (4) market capitalisation and (5) the percentage of institutional shareholdings. We discovered that the results (unreported) remain consistent with our initial findings even after including additional control variables.

To further build confidence that the association we document does not reflect endogeneity in the COVID-CSR disclosure relationship, we use the 2SLS estimator. This instrumental variable regression accounts for endogeneity arising out of omitted variables and reverse causality. However, Wintoki, Linck, and Netter (2012) argue that finding a valid and exogenous instrument remains a gold standard in dealing with endogeneity. The suitable instrumental variable(s) must satisfy (1) the relevance criteria, means correlated with independent variable, and (2) the exclusion restriction, meaning it is uncorrelated with the error terms (Larcker & Rusticus, 2010). Subsequently, we expect the instrumental variable – the number of confirmed COVID-19 cases worldwide – to be correlated with the NZ COVID-19 outbreak and uncorrelated with expected CSR disclosure. Column (3) in Table 5 shows that the instrumental variables regression yields results consistent with our initial conclusions.

In unreported results, we use the least absolute deviation regression approach to estimate the model to address issues like non-normality and heteroscedasticity of error distribution un-ideal for OLS estimates (Foss, Myrtveit, & Stensrud, 2001). The LAD estimator is a special case of regression quantile estimators (Koenker, 2000; Koenker & Bassett, 1978), which are useful in the case of non-normality and heteroscedasticity in the error distribution. LAD estimator minimises the sum of the absolute deviation of the residuals and gives less weight to large residuals, rendering it more robust to outliers than OLS (Greene, 2002). Taken together, all of our robustness tests results corroborate our baseline findings that the COVID-19 outbreak is significant and positively associated with CSR disclosure.

4.5 Channel analysis

Since we hypothesise that managers in response to the COVID-19 outbreak reduce information asymmetry by enhancing CSR disclosure, it is important to test the information asymmetry channel. To do this, we followed the corporate governance literature that emphasises the role of the board of directors in reducing information asymmetry (Cormier, Ledoux, Magnan, & Aerts, 2010; Farooq *et al.*, 2021; Healy & Palepu, 2001). According to stakeholder-agency theory, the board of directors uses CSR disclosure to achieve a balance between satisfying stakeholders' interests (Chan, Watson, & Woodliff, 2014; Ingley & Van der Walt, 2004; Shankman, 1999) and accounting for their actions to them (Brennan & Solomon, 2008; Farooq, Zaman, & Nadeem, 2021; Healy, 2003). The findings of these studies suggest that a well-structured board significantly curtails information asymmetry between firms and stakeholders and leads to better CSR disclosure. In general, it is assumed that the strength of the board of directors' effectiveness can be corroborated through board size, independence and diversity among members (Jain & Zaman, 2020; Prado-Lorenzo & Garcia-Sanchez, 2010; Zaman *et al.*, 2021). We provide a discussion of the role of these characteristics and their impact on COVID-19 and the CSR disclosure relationship in the subsequent section.

Stakeholder-agency framework contends that large boards are representative of diverse stakeholders' interests and can help companies to garner CSR and subsequently disclose such information to stakeholders (Gerged, 2021; Zaman *et al.*, 2021). Consistent with this,

Beji, Yousfi, Loukil, and Omri (2021) argued that large boards can incorporate various perspectives from different stakeholders and can be instrumental in the ethical decision-making process. Conversely, it is more likely that the companies with a smaller board of directors can be captured by profit-oriented and powerful managers that only represent shareholders' interests (Farooq *et al.*, 2021). Hence, small-sized boards may result in increased information asymmetry between firms and stakeholders by limiting CSR disclosure (Jizi, 2017; Jizi, Salama, Dixon, & Stratling, 2014).

Much of the literature relies on the assumption that independent board members can monitor the management better, and thereby be more effective in reducing stakeholder-agency conflicts (Zaman, Atawnah, Baghdadi, & Liu, 2021; Zaman *et al.*, 2021). These arguments are based on the notion that serving loyalties and personal ties between CEO and board of directors compromise the board's monitoring activities and often exacerbate the stakeholder-agency conflict. In line with this, Zaman *et al.* (2021) in their findings suggest that a captured board (CEO connected directors) increases information asymmetry among firm stakeholders, leading to higher stakeholder violations. More recently in the context of materiality assessment disclosure, Farooq *et al.* (2021) indicate in their research that independent directors on company boards reduce managerial capture and provide more extensive disclosure about companies' materiality assessment practices in sustainability reports. We believe independent directors due to their financial acumen can be instrumental in dealing with COVID-19 shocks, subsequently contributing to higher CSR disclosure.

Women on boards are perceived to be effective monitors. Research focusing on board diversity demonstrates that women's leadership styles that include inclusiveness, open communications and high moral reasoning (Eagly & Johnson, 1990) lead to a better organisational outcome. Supporting these arguments, many studies' findings suggest that boardroom gender diversity reduces information asymmetry and leads to higher disclosure (Carvajal, Nadeem, & Zaman, 2021; Fernandez-Feijoo, Romero, & Ruiz-Blanco, 2014; Nadeem, 2020), including CSR disclosure (Khan, Muttakin, & Siddiqui, 2013). Similarly, the presence of gender diversity on corporate boards can help companies deal with exogenous shocks (Sun, Zhu, & Ye, 2015).

Taken together, the above discussion implies that a well-structured board, that is, a large and independent board with a large number of women, significantly reduces the information asymmetry problems between firms and their stakeholders, subsequently leading to higher CSR disclosure. Since the COVID-19 outbreak has significantly elevated information asymmetry problems, we expect a positive association between the COVID-19 outbreak and CSR disclosure to be pronounced in companies with well-structured boards of directors.

To test our arguments, we use the interaction variable approach. We created interacting terms by multiplying board size, board independence and gender diversity with COVID-19 outbreak variable and individually introduce interacting terms (i.e. $COVID_{NZ,t} \times BSIZE_{i,t}$, $COVID_{NZ,t} \times INDIR_{i,t}$, and $COVID_{NZ,t} \times WOMEN_{i,t}$) in the baseline regression model. The results are presented in Table 6.

The results reported in columns (1) to (3) show that coefficient estimate of moderating effect of board size ($\beta = 2.473, p < 0.01$), board independence ($\beta = 0.001, p < 0.01$) and gender diversity ($\beta = 2.474, p < 0.01$) are positive and statistically significant on CSR disclosure at the 1% level of significance. These results support our conjecture that strong board monitoring reduces information asymmetry and encourages managers to increase CSR disclosure in response to the COVID-19 outbreak.

4.6 Additional analysis

4.6.1 Does the COVID-CSR relationship vary in different pandemic stages? (Incubation, outbreak, recovery). The severity and consequences of COVID-19 were not perceived from its very beginning, at least not until its epicentre changed from China to Italy, and then to the

Explanatory variables	Dependent variable: CSR disclosure (1) Board size	(2) Independent directors on board	(3) Women on board
$COVID_{NZ,t}$	1.154*** (0.216)	0.728*** (0.040)	1.158*** (0.216)
$BSIZE_{i,t}$	0.433*** (0.042)		
$COVID_{NZ,t} \times BSIZE_{i,t}$	2.473*** (0.212)		
$INDIR_{i,t}$		0.557 (.444)	
$COVID_{NZ,t} \times INDIR_{i,t}$		0.001*** (0.000)	
$WOMEN_{NZ,t}$			1.839*** (0.397)
$COVID_{NZ,t} \times WOMEN_{i,t}$			2.474*** (0.213)
$CONSTANT_{i,t}$	9.100*** (0.984)	8.009*** (1.913)	3.429*** (1.280)
Control variables	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes
Observations	2,672	2,672	2,638
$F-stat\ (p-value)$	0.000	0.000	0.000
Adj R^2	0.547	0.579	0.542

Note(s): Table 6 reports the results on the moderating role of board structure on the relationship between the COVID-19 outbreak and CSR disclosure. The robust standard errors are reported in the parentheses. And "***", "**" and "*", represent the significance at 1, 5 and 10% levels, respectively. The variables are defined as in Appendix

Table 6. COVID-19 outbreak and CSR disclosure: the moderating role of board structure

United States. The continuous increase in confirmed cases and rising death toll led to huge uncertainty and fear among businesses, and information access became more difficult for stakeholders. Since our core argument implies that managers use CSR disclosure to reduce information asymmetries that arise due to the COVID-19 outbreak, we expect the positive association between COVID-19 and CSR disclosure to be pronounced along with an increase in the intensity of COVID-19-related cases. To validate our results, we adopt a life cycle approach. More specifically, we organise our analysis into three stages: (1) incubation stage– fourteen days starting from the first confirmed case of COVID-19 in New Zealand (28 February 2020 through 12 March 2020), (2) outbreak stage – a period when COVID-19 rapidly spread in New Zealand until the reported confirmed cases are in double-digit for the last time (13 March 2020 through 18 April 2020) and (3) recovery stage – a period when COVID-19 cases started to decline in New Zealand (19 April 2020 through 10 May 2020). We present our results in Table 7.

In line with our contention, the results reported in Table 7 suggest that the positive relationship between COVID-19 and CSR disclosure is more pronounced during the outbreak stage ($\beta = 1.156, p < 0.01$) compared with the recovery ($\beta = 0.874, p < 0.01$) and incubation ($\beta = 0.450, p > 0.01$) stages. These findings provide additional support to our baseline results.

4.6.2 What is the role of government, peers and media in moderating the COVID-CSR relationship?. Thus far we have established that board internal monitoring encourages managers to provide more CSR disclosure in response to the COVID-19 outbreak. There might be external exogenous characteristics affecting the COVID-19 and CSR disclosure nexus. More specifically, in this section, we examine the moderating effect of government response, peer CSR pressure and media coverage on COVID-19 and CSR disclosure. First, the stringency and the timing of government response is vital in such a rapidly spreading crisis. The eruption of COVID-19 into a pandemic created a wide range of responses by governments everywhere. However, governments have varied substantially in the measures that they have implemented and how quickly they were put into effect (Hale, Petherick, Phillips, & Webster, 2020). We, therefore, expect that the variation in the level of government response could significantly affect the COVID-19 outbreak and CSR disclosure nexus.

Explanatory variables	Dependent variable: CSR disclosure (1) Incubation	(2) Outbreak	(3) Recovery
$COVID_{NZ,t}$	0.450 (0.391)	1.156*** (0.210)	0.874*** (0.045)
$RANGE_{i,t}$	0.049 (0.103)	0.019 (0.087)	−0.425*** (0.161)
$ILLIQ_{i,t}$	−0.093 (0.057)	−0.286*** (0.065)	−0.481*** (0.105)
$PROF_{i,t}$	−0.315*** (0.116)	−0.352*** (0.116)	−0.048 (0.175)
$LEV_{i,t}$	−0.039 (0.042)	−0.002 (0.046)	0.064 (0.074)
$SIZE_{i,t}$	0.424** (0.193)	0.664*** (0.200)	1.395*** (0.346)
$AGE_{j,t}$	−0.007 (0.064)	0.194*** (0.066)	0.736*** (0.129)
$BETA_{NZ,t}^{MKT}$	−0.037 (0.039)	−0.044 (0.043)	−0.079 (0.074)
$BETA_{NZ,t}^{SMB}$	−0.143* (0.078)	−0.334*** (0.104)	−0.387* (0.200)
$BETA_{NZ,t}^{HML}$	0.000 (0.062)	0.153** (0.066)	0.172 (0.106)
$BETA_{NZ,t}^{MOM}$	−0.052 (0.039)	−0.091** (0.041)	−0.064 (0.077)
$CONSTANT_{i,t}$	7.733*** (0.936)	7.796*** (0.790)	−17.998*** (2.492)
Industry effect	Yes	Yes	Yes
Observations	310	1,062	1,095
$F-stat\ (p-value)$	0.000	0.000	0.000
Adj R^2	0.249	0.303	0.182

Table 7. COVID 19 outbreak and CSR disclosure – the role of pandemic life-cycle

Note(s): Table 7 reports the results across three different pandemics stages in New Zealand such as incubation, outbreak and recovery in columns (1), (2) and (3), respectively. We describe the timeline of events characterising each of these periods in Section 4.6.1. The robust standard errors are reported in the parentheses. And "***", "**" and "*", represent the significance at 1, 5 and 10% levels, respectively. The variables are defined as in Appendix

To capture the New Zealand government response, we use the "Stringency Index" (STRINGE), an unweighted additive index devised by Hale *et al.* (2020) that provides a systematic way to track the stringency of government responses to COVID-19 across countries over time. Hale *et al.* (2020) collect publicly available information on the nine policy indicators recording information on containment and closure policies: (1) school closure, (2) workplace closure, (3) cancellation of public events, (4) restrictions on gathering size, (5) public transport closure, (6) stay at home requirements, (7) restriction on internal movements, (8) restriction on international travel and (9) public information campaign. The "Stringency Index" captures variation in containment and closure policies only. For each of the nine indicators, Hale *et al.* (2020) create a score by taking the ordinal value and adding a weighted constant if the policy is general rather than targeted, if applicable. Then each of these is rescaled by their maximum value to create a score between 0 and 100, with a missing value contributing 0 (zero) [3]. These nine scores are then averaged to get the composite stringency index. Notably in higher stringency measures, the information opacity will be higher. This is because more government restrictions will make it difficult for stakeholders to access the required information, thereby exacerbating the ambiguity about firms' future. Such measures will encourage managers to increase CSR disclosure. Therefore, we expect that any variation in the level of government response could significantly affect the COVID-CSR disclosure.

Second, following prior literature we use peer CSR pressure as an exogenous shock to COVID-19 and CSR disclosure nexus. Our motivation to examine the effect of peer CSR pressure on COVID-19 and CSR disclosure nexus is based on literature that suggests companies mimic behaviours of their peers or rivals (Luo, Wang, & Zhang, 2017). In this way, for instance, Lin, Mao, and Wang (2018) document peer effect as an important factor in determining corporations' voluntary disclosure policies. Their finding suggests that improvement in the information environment of Russell 2000 index firms puts pressure on

their peers to increase their voluntary disclosure. More recently, Tang, Fu, and Yang's (2019) findings suggest that focal firms' CSR is significantly determined by other companies' CSR policies. We, therefore, expect that the interaction of peer CSR disclosure with the COVID-19 outbreak could have a significant effect on focal firm CSR disclosure. We follow Leary and Roberts (2014) in their approach to measuring peer disclosure. Leary and Roberts (2014) estimate the average capital structure of peer firms; we, in contrast, compute the average CSR disclosure of peer firms with a similar approach. The average peer CSR disclosure can be defined as the industry-day average CSR disclosure, excluding the focal firm CSR disclosure, that is, firm i. Mathematically, it can be written as follows:

$$\overline{PEERCSR_{i,t}} = \frac{\left(\sum_{i=1}^{n} CSR_{i,t}\right) - CSR_{i,t}}{n-1} \tag{7}$$

Where on day t, $\overline{PEERCSR_{i,t}}$ denotes the average CSR disclosure of the peers of firm "i", $CSR_{i,t}$ is the CSR disclosure for firm "i". The higher value of $\overline{PEERCSR_{i,t}}$ indicates the higher CSR disclosure among the peers of firm "i" and "n" represents the number of firms in an industry.

Finally, media coverage can play a key role in moderating the COVID-CSR disclosure relationship since it can exert a great deal of influence on corporate behaviour in general, and on disclosure in particular (Zaman, Bahadar, Kayani, & Arslan, 2018). Note that Kilgo, Yoo, and Johnson (2019) argue that during crisis times, traditional news outlets contribute to public fear and panic, emphasising risks and uncertainties. To deal with such uncertainties, managers can increase their CSR disclosure through companies' press releases. We, therefore, expect the positive relationship between COVID-19 and CSR disclosure to be more pronounced during higher media coverage of pandemic scenarios. To measure the media coverage variable, we downloaded the news articles published from 01 January 2020 to 10 May 2020 in the top five newspapers according to circulation rate in New Zealand from the Dow Jones Factiva database. The newspapers include *The New Zealand Herald, The Dominion Post, The Press, Otago Daily Times* and *Waikato Times*. A search of keywords such as *Coronavirus, COVID-19* and *SRS-Cov-2* was carried out to retrieve articles on the subject of the COVID-19 pandemic. Following Tetlock (2011), we exclude news articles with fewer than 50 words to alleviate the concerns about articles being a short summary. We parse the news articles and count the number of positive and negative words using the classification method proposed by Loughran and McDonald (2011). Finally, we measure the average media coverage as follows:

$$\overline{MEDIA_{NZ,t}} = \frac{\sum_{k=1}^{N}\left(\frac{POSITIVE_{k,t} - NEGATIVE_{k,t}}{LENGTH_{k,t}}\right)}{N_t} \tag{8}$$

Where on day t, $\overline{MEDIA_{NZ,t}}$ denotes the average of net media coverage in New Zealand; $POSITIVE_{k,t}$ number of positive words in k article; $NEGATIVE_{k,t}$ number of negative words in k article; $LENGTH_{k,t}$ length of k article; and N_t represents the total number of articles published.

We test the role of government stringency response, peer CSR pressure and media coverage in influencing the relationship between the COVID-19 outbreak and CSR disclosure. We created interaction terms by multiplying each of the three exogenous factors by the COVID-19 outbreak variable and introducing each exogenous factor (e.g. STRING) and its corresponding interacting term (e.g. STRING x COVID) in the regression separately. Table 8 reports the results of these interactions on CSR disclosure.

The result reported in columns (1) to (3) suggest the coefficient estimates of interaction variables government stringency response, that is, $COVID_{NZ,t} \times STRINGE_{NZ,t}$ ($\beta = 0.128$, $p < 0.01$), peer CSR pressure, that is, $COVID_{NZ,t} \times \overline{PEERCSR}_{i,t}$ ($\beta = 1.198$,

Variables	Dependent variable: CSR disclosure (1) Stringency of government response	(3) Peer CSR performance	(4) Media coverage
$COVID_{NZ,t}$	1.047*** (0.550)	2.571*** (0.143)	1.957*** (0.073)
$STRINGE_{NZ,t}$	0.103*** (0.017)		
$COVID_{NZ,t} \times STRINGE_{NZ,t}$	0.128*** (0.050)		
$\overline{PEERCSR}_{i,t}$		0.326*** (0.024)	
$COVID_{NZ,t} \times \overline{PEERCSR}_{i,t}$		1.198*** (0.138)	
$MEDIA_{NZ,t}$			0.857*** (0.125)
$COVID_{NZ,t} \times MEDIA_{NZ,t}$			0.663*** (0.085)
$CONSTANT_{i,t}$	5.112* (2.633)	5.712*** (0.442)	2.948*** (0.794)
Control variables	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes
Observations	2,616	2,330	2,317
$F-stat\ (p-value)$	0.000	0.000	0.000
Adj R^2	0.565	0.810	0.551

Table 8.
COVID-19 outbreak and CSR disclosure – the moderating role of external factors

Note(s): Table 8 reports the regression results for the moderating role of exogenous factors such as government stringency response, peer CSR pressure and media coverage in COVID-CSR disclosure relation, respectively. The robust standard errors are reported in the parentheses. And "***", "**" and "*" represent the significance at 1, 5 and 10% levels, respectively. The variables are defined as in Appendix

$p < 0.01$), and media coverage, that is, ($\beta = 0.663$, $p < 0.01$) are significantly positively associated with CSR disclosure. These results provide new insights that higher government stringency, peer pressure and media coverage of pandemic exacerbate the external information environment caused by the COVID-19 outbreak. In turn, a poor information environment encourages managers to provide more CSR disclosure.

5. Conclusion

Catastrophic events have substantial and adverse short- and long-term economic effects that challenge a firm's operational ability and increase uncertainty among its stakeholders (Ding *et al.*, 2021). In such situations, when the outcome is a definite loss and the future is uncertain, firms face a dilemma either to increase voluntary disclosure (i.e. CSR disclosure) that reduces the ambiguity among stakeholders, or limit this disclosure due to additional costs. Against this backdrop, our original study examines the extent to which the COVID-19 outbreak determines the CSR disclosure and evaluates the conditions that affect such a relationship. To map CSR disclosure, we constructed a novel textual base measure by extracting the companies' press releases of NZX listed companies from the Factiva database. Our novel finding reveals that COVID-19 has a positive and significant effect on CSR disclosure. Our result remains robust in a series of robustness tests, and after addressing endogeneity concerns. In channel analysis, we find the positive association between the COVID-19 outbreak and CSR disclosure to be more pronounced in companies with a well-structured board.

These findings support our conjecture that strong board monitoring lowers information asymmetry and encourages managers to increase CSR disclosure in response to COVID-19 outbreak. In an additional analysis, we also analyse whether the positive relationship between COVID-19 and CSR disclosure varies across the pandemic life cycle. Our findings demonstrate that the documented relationship is more pronounced during the outbreak stage, compared with the recovery and incubation stages. These findings provide additional support that managers increase CSR disclosure when they encounter higher uncertainty in

business operations arising from COVID-19. Finally, we examined the impact of external stakeholders such as government stringency response, peer CSR pressure and media coverage on the relationship between COVID-19 and CSR disclosure. Our findings indicate that the documented relationship between COVID-19 outbreak and CSR disclosure is positively moderated by higher government stringency, increased peer CSR pressure and intense media coverage of pandemic.

Our findings contribute to the ongoing research on the disclosure implications of COVID-19 (Adams & Abhayawansa, 2021; Hassan *et al.*, 2021; Humphreys & Trotman, 2021) and hold important implications. First, the study develops a novel daily construct for CSR disclosure using textual analysis on corporate press releases during the COVID-19 outbreak. This measure can be further deployed to extend our study findings by examining the impact of CSR disclosure on multiple outcomes such as organisational performance, access to finance and investors' response. Finally, our findings shed light on the corporate's social behaviour in response to the pandemic and inform stakeholders about managerial disclosure decisions during a health crisis.

Notes

1. For details, please see ASIC media release: https://asic.gov.au/about-asic/news-centre/find-a-media-release/2021-releases/21-200mr-asic-prosecutes-ten-companies-for-failing-to-lodge-financial-reports/
2. Mean value of CSR is 6.516, while the estimated coefficient and the standard deviation for COVID-19 is 1.386 and 131.746, respectively. One standard deviation increase in COVID-19 increases CSR activities by 28% [(coefficient of COVID-19 x standard deviation of COVID)/mean of CSR = $(1.386 \times 131.746)/6.516 = 0.28$].
3. Hale *et al.* (2020) use a conservative assumption to calculate the stringency index. Where data for one of the seven indicators are missing, they contribute "0" to the index. An alternative assumption would be to not count missing indicators in the score, essentially assuming they are equal to the mean of the indicators for which we have data. They argued that despite the fact this conservative approach "punishes" countries for which less information is available, it does avoid the risk of overgeneralising from limited information.

References

Adams, C. A., & Abhayawansa, S. (2021). Connecting the COVID-19 pandemic, environmental, social and governance (ESG) investing and calls for "harmonisation" of sustainability reporting. *Critical Perspectives on Accounting*, *82*, 102309.

Adams, M., & Hardwick, P. (1998). An analysis of corporate donations: United Kingdom evidence. *Journal of Management Studies*, *35*(5), 641–654.

Aguilera, R. V., & Jackson, G. (2010). Comparative and international corporate governance. *Academy of Management Annals*, *4*(1), 485–556.

Ahern, K. R., & Sosyura, D. (2014). Who writes the news? Corporate press releases during merger negotiations. *Journal of Finance*, *69*(1), 241–291.

Albitar, K., Al-Shaer, H., & Elmarzouky, M. (2021). Do assurance and assurance providers enhance COVID-related disclosures in CSR reports? An examination in the UK context. *International Journal of Accounting & Information Management*, *29*(3), 410–428.

Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. *The Review of Corporate Finance Studies*, *9*(3), 593–621.

Allegrini, V., & Monteduro, F. (2018). The role of uncertainty in performance information disclosure. *International Journal of Public Sector Management*, *31*(5), 583–598.

Bae, K.-H., El Ghoul, S., Gong, Z. J., & Guedhami, O. (2021). Does CSR matter in times of crisis? Evidence from the COVID-19 pandemic. *Journal of Corporate Finance*, *67*, 101876.

Banerjee, R., Illes, A., Kharroubi, E., & Garralda, J. M. S. (2020). *Covid-19 and corporate sector liquidity* (BIS Bulletins 10). Bank for International Settlements.

Beji, R., Yousfi, O., Loukil, N., & Omri, A. (2021). Board diversity and corporate social responsibility: Empirical evidence from France. *Journal of Business Ethics*, *173*(1), 133–155.

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. *Multilevel Theory, Research, and Methods in Organizations*, 349–381.

Branco, M. C., & Rodrigues, L. L. (2008). Factors influencing social responsibility disclosure by Portuguese companies. *Journal of Business Ethics*, *83*(4), 685–701.

Brennan, N. M., & Solomon, J. (2008). Corporate governance, accountability and mechanisms of accountability: An overview. *Accounting, Auditing & Accountability Journal*, *21*(7), 885–906.

Broadstock, D. C., Chan, K., Cheng, L. T., & Wang, X. (2021). The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. *Finance Research Letters*, *38*, 101716.

Bushee, B. J., Core, J. E., Guay, W., & Hamm, S. J. W. (2010). The role of the business press as an information intermediary. *Journal of Accounting Research*, *48*(1), 1–19.

Bushee, B. J., & Miller, G. S. (2012). Investor relations, firm visibility, and investor following. *The Accounting Review*, *87*(3), 867–897.

Cahan, S. F., Chen, C., Chen, L., & Nguyen, N. H. (2015). Corporate social responsibility and media coverage. *Journal of Banking & Finance*, *59*, 409–422.

Carvajal, M., Nadeem, M., & Zaman, R. (2021). Biodiversity disclosure, sustainable development and environmental initiatives: Does board gender diversity matter? *Business Strategy and the Environment*, *31*(3), 969–987.

Chan, M. C., Watson, J., & Woodliff, D. (2014). Corporate governance quality and CSR disclosures. *Journal of Business Ethics*, *125*(1), 59–73.

Chantziaras, A., Dedoulis, E., Grougiou, V., & Leventis, S. (2020). The impact of religiosity and corruption on CSR reporting: The case of US banks. *Journal of Business Research*, *109*, 362–374.

Cho, C. H., Michelon, G., Patten, D. M., & Roberts, R. W. (2015). CSR disclosure: The more things change . . .? *Accounting, Auditing & Accountability Journal*, *28*(1), 14–35.

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, *6*(4), 284–290.

Core, J. E., Guay, W., & Larcker, D. F. (2008). The power of the pen and executive compensation. *Journal of Financial Economics*, *88*(1), 1–25.

Cormier, D., Ledoux, M. J., Magnan, M., & Aerts, W. (2010). Corporate governance and information asymmetry between managers and investors. *Corporate Governance: The International Journal of Business in Society*, *10*(5), 574–589.

Cowen, S. S., Ferreri, L. B., & Parker, L. D. (1987). The impact of corporate characteristics on social responsibility disclosure: A typology and frequency-based analysis. *Accounting, Organizations and Society*, *12*(2), 111–122.

Cui, L., Kent, P., Kim, S., & Li, S. (2021). Accounting conservatism and firm performance during the COVID-19 pandemic. *Accounting & Finance*, *61*(4), 5543–5579.

Deegan, C. (2002). The legitimising effect of social and environmental disclosures – a theoretical foundation. *Accounting, Auditing & Accountability Journal*, *15*(3), 282–311.

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review*, *86*(1), 59–100.

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2014). Corporate social responsibility disclosure and the cost of equity capital: The roles of stakeholder orientation and financial transparency. *Journal of Accounting and Public Policy*, *33*(4), 328–355.

Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., & Yang, Y. G. (2012). Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review*, *87*(3), 723–759.

Didier, T., Huneeus, F., Larrain, M., & Schmukler, S. L. (2021). Financing firms in hibernation during the COVID-19 pandemic. *Journal of Financial Stability*, *53*, 100837.

Dienes, D., Sassen, R., & Fischer, J. (2016). What are the drivers of sustainability reporting? A systematic review. *Sustainability Accounting, Management and Policy Journal*, *7*(2), 154–189.

Ding, W., Levine, R., Lin, C., & Xie, W. (2021). Corporate immunity to the COVID-19 pandemic. *Journal of Financial Economics*, *141*(2), 802–830.

Dong, E., Du, H., & Gardner, L. (2020). An interactive web-based dashboard to track COVID-19 in real time. *The Lancet Infectious Diseases*, *20*(5), 533–534.

Donthu, N., & Gustafsson, A. (2020). Effects of COVID-19 on business and research. *Journal of Business Research*, *117*, 284–289.

Eagly, A. H., & Johnson, B. T. (1990). Gender and leadership style: A meta-analysis. *Psychological Bulletin*, *108*(2), 233.

Farooq, M. B., Zaman, R., & Nadeem, M. (2021). Accountability's AA1000AP standard: A framework for integrating sustainability into organisations. *Sustainability Accounting, Management and Policy Journal*, *12*(5), 1108–1139.

Farooq, M. B., Zaman, R., Sarraj, D., & Khalid, F. (2021). Examining the extent of and drivers for materiality assessment disclosures in sustainability reports. *Sustainability Accounting, Management and Policy Journal*, *12*(5), 965–1002.

Fernandez-Feijoo, B., Romero, S., & Ruiz-Blanco, S. (2014). Women on boards: Do they affect sustainability reporting? *Corporate Social Responsibility and Environmental Management*, *21*(6), 351–364.

Foss, T., Myrtveit, I., & Stensrud, E. (2001). A comparison of LAD and OLS regression for effort prediction of software projects. *Proc. 12th European Software Control and Metrics Conference (ESCOM 2001)*.

Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Cambridge University Press.

Frino, A., Palumbo, R., Capalbo, F., Gerace, D., & Mollica, V. (2013). Information disclosure and stock liquidity: Evidence from Borsa Italiana. *Abacus*, *49*(4), 423–440.

Gao, F., Dong, Y., Ni, C., & Fu, R. (2016). Determinants and economic consequences of non-financial disclosure quality. *European Accounting Review*, *25*(2), 287–317.

Gerged, A. M. (2021). Factors affecting corporate environmental disclosure in emerging markets: The role of corporate governance structures. *Business Strategy and the Environment*, *30*(1), 609–629.

Ghosh, D., & Olsen, L. (2009). Environmental uncertainty and managers' use of discretionary accruals. *Accounting, Organizations and Society*, *34*(2), 188–205.

Goodell, J. W. (2020). COVID-19 and finance: Agendas for future research. *Finance Research Letters*, *35*, 101512.

Greene, W. H. (2002). *Econometric analysis* (5. Auflage). Upper Saddle River, NJ: Prentice-Hall.

Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*, *59*, 5–21.

Hale, T., Petherick, A., Phillips, T., & Webster, S. (2020). *Variation in Government Responses to COVID-19*. Blavatnik School of Government Working Paper 31. University of Oxford.

Hallgren, K. A. (2012). Computing inter-rater reliability for observational data: An overview and tutorial. *Tutorials in Quantitative Methods for Psychology*, *8*(1), 23–34.

Haniffa, R. M., & Cooke, T. E. (2005). The impact of culture and governance on corporate social reporting. *Journal of Accounting and Public Policy*, *24*(5), 391–430.

Hassan, A., Elamer, A. A., Lodh, S., Roberts, L., & Nandy, M. (2021). The future of non-financial businesses reporting: Learning from the Covid-19 pandemic. *Corporate Social Responsibility and Environmental Management*, *28*(4), 1231–1240.

He, H., & Harris, L. (2020). The impact of Covid-19 pandemic on corporate social responsibility and marketing philosophy. *Journal of Business Research*, *116*, 176–182.

Healy, P. M. (2003). Discussion of privacy in e-commerce: Development of reporting standards, disclosure, and assurance services in an unregulated market. *Journal of Accounting Research*, *41*(2), 311–315.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, *31*(1-3), 405–440.

Healy, P. M., Hutton, A. P., & Palepu, K. G. (1999). Stock performance and intermediation changes surrounding sustained increases in disclosure. *Contemporary Accounting Research*, *16*(3), 485–520.

Hill, C. W., & Jones, T. M. (1992). Stakeholder-agency theory. *Journal of Management Studies*, *29*(2), 131–154.

Humphreys, K. A., & Trotman, K. T. (2021). Judgment and decision making research on CSR reporting in the COVID-19 pandemic environment. *Accounting & Finance*, *62*(1), 739–765.

Ingley, C. B., & Van der Walt, N. T. (2004). Corporate governance, institutional investors and conflicts of interest. *Corporate Governance: An International Review*, *12*(4), 534–551.

Jain, T., & Jamali, D. (2016). Looking inside the black box: The effect of corporate governance on corporate social responsibility. *Corporate Governance: An International Review*, *24*(3), 253–273.

Jain, T., & Zaman, R. (2020). When boards matter: The case of corporate social irresponsibility. *British Journal of Management*, *31*(2), 365–386.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Jizi, M. (2017). The influence of board composition on sustainable development disclosure. *Business Strategy and the Environment*, *26*(5), 640–655.

Jizi, M. I., Salama, A., Dixon, R., & Stratling, R. (2014). Corporate governance and corporate social responsibility disclosure: Evidence from the US banking sector. *Journal of Business Ethics*, *125*(4), 601–615.

Khan, A., Muttakin, M. B., & Siddiqui, J. (2013). Corporate governance and corporate social responsibility disclosures: Evidence from an emerging economy. *Journal of Business Ethics*, *114*(2), 207–223.

Khlif, H., Hussainey, K., & Achek, I. (2015). The effect of national culture on the association between profitability and corporate social and environmental disclosure. *Meditari Accountancy Research*, *23*(3), 296–321.

Kilgo, D. K., Yoo, J., & Johnson, T. J. (2019). Spreading Ebola panic: Newspaper and social media coverage of the 2014 Ebola health crisis. *Health Communication*, *34*(8), 811–817.

Koenker, R. (2000). Galton, Edgeworth, Frisch, and prospects for quantile regression in econometrics. *Journal of Econometrics*, *95*(2), 347–374.

Koenker, R., & Bassett, G., Jr. (1978). Regression quantiles. *Econometrica: Journal of the Econometric Society*, *46*(1), 33–50. doi: 10.2307/1913643.

Koerniadi, H., Krishnamurti, C., & Tourani-Rad, A. (2014). Corporate governance and risk-taking in New Zealand. *Australian Journal of Management*, *39*(2), 227–245.

Krause, J., Sellhorn, T., & Ahmed, K. (2017). Extreme uncertainty and forward-looking disclosure properties. *Abacus*, *53*(2), 240–272.

Larcker, D. F., & Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. *Journal of Accounting and Economics*, *49*(3), 186–205.

Lassoued, N., & Khanchel, I. (2021). Impact of COVID-19 pandemic on earnings management: An evidence from financial reporting in European firms. *Global Business Review*. doi: 10.1177/09721509211053491.

Leary, M. T., & Roberts, M. R. (2014). Do peer firms affect corporate financial policy? *The Journal of Finance*, *69*(1), 139–178.

Levy, D. L. (2021). COVID-19 and global governance. *Journal of Management Studies*, *58*(2), 562–566.

Li, K., Liu, X., Mai, F., & Zhang, T. (2021). The role of corporate culture in bad times: Evidence from the COVID-19 pandemic. *Journal of Financial and Quantitative Analysis*, *57*(7), 2545–2583.

Lin, Y., Mao, Y., & Wang, Z. (2018). Institutional ownership, peer pressure, and voluntary disclosures. *The Accounting Review*, *93*(4), 283–308.

Loughran, T., & McDonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *The Journal of Finance*, *66*(1), 35–65.

Luo, L. L., & Tang, Q. (2016). Does national culture influence corporate carbon disclosure propensity? *Journal of International Accounting Research*, *15*(1), 17–47.

Luo, X. R., Wang, D., & Zhang, J. (2017). Whose call to answer: Institutional complexity and firms' CSR reporting. *Academy of Management Journal*, *60*(1), 321–344.

Mateo-Márquez, A. J., González-González, J. M., & Zamora-Ramírez, C. (2020). Countries' regulatory context and voluntary carbon disclosures. *Sustainability Accounting, Management and Policy Journal*, *11*(2), 383–408.

McKenny, A. F., Short, J. C., & Newman, S. M. (2012). CAT scanner. (Version 1.0). [Computer Software]. Retrived from http://www.catscanner.net/.

Moss, T. W., Renko, M., Block, E., & Meyskens, M. (2018). Funding the story of hybrid ventures: Crowdfunder lending preferences and linguistic hybridity. *Journal of Business Venturing*, *33*(5), 643–659.

Nadeem, M. (2020). Does board gender diversity influence voluntary disclosure of intellectual capital in initial public offering prospectuses? Evidence from China. *Corporate Governance: An International Review*, *28*(2), 100–118.

Nagar, V., Schoenfeld, J., & Wellman, L. (2019). The effect of economic policy uncertainty on investor information asymmetry and management disclosures. *Journal of Accounting and Economics*, *67*(1), 36–57.

O'Hara, M., & Zhou, X. (2021). Anatomy of a liquidity crisis: Corporate bonds in the COVID-19 crisis. *Journal of Financial Economics*, *142*(1), 46–68.

Orlitzky, M., & Benjamin, J. D. (2001). Corporate social performance and firm risk: A meta-analytic review. *Business & Society*, *40*(4), 369–396.

Payne, G. T., Brigham, K. H., Broberg, J. C., Moss, T. W., & Short, J. C. (2011). Organizational virtue orientation and family firms. *Business Ethics Quarterly*, *21*(2), 257–285.

Pencle, N., & Mălăescu, I. (2016). What's in the words? Development and validation of a multidimensional dictionary for CSR and application using prospectuses. *Journal of Emerging Technologies in Accounting*, *13*(2), 109–127.

Pennebaker, J. W., Chung, C. K., Ireland, M., Gonzales, A., & Booth, R. J. (2007). *The Development and Psychometric Properties of LIWC2007*. The University of Texas.

Prado-Lorenzo, J.-M., & Garcia-Sanchez, I.-M. (2010). The role of the board of directors in disseminating relevant information on greenhouse gases. *Journal of Business Ethics*, *97*(3), 391–424.

Roberts, M. R., & Whited, T. M. (2013). Endogeneity in empirical corporate finance. *Handbook of the Economics of Finance*, Elsevier, *2*, 493–572.

Rodale, J. I. (1978). *The Synonym Finder*. Rodale Press.

Shankman, N. A. (1999). Reframing the debate between agency and stakeholder theories of the firm. *Journal of Business Ethics*, *19*(4), 319–334.

Short, J. C., Broberg, J. C., Cogliser, C. C., & Brigham, K. H. (2010). Construct validation using computer-aided text analysis (CATA) an illustration using entrepreneurial orientation. *Organizational Research Methods*, *13*(2), 320–347.

Soltes, E. (2010). *Disseminating firm disclosures*. Working Paper. Disseminating Firm Disclosures.

Spiegel, M., & Tookes, H. (2021). Business restrictions and Covid-19 fatalities. *The Review of Financial Studies*, *34*(11), 5266–5308.

Sun, S. L., Zhu, J., & Ye, K. (2015). Board openness during an economic crisis. *Journal of Business Ethics*, *129*(2), 363–377.

Tang, P., Fu, S., & Yang, S. (2019). Do peer firms affect corporate social performance? *Journal of Cleaner Production*, *239*, 118080.

Tetlock, P. C. (2011). All the news that's fit to reprint: Do investors react to stale information? *The Review of Financial Studies*, *24*(5), 1481–1512.

Tsang, A., Hu, W., & Li, X. (2020). CSR and firm value: A comparative study of CSR performance measures. *China Accounting and Finance Review*. In press.

Tsileponis, N., Stathopoulos, K., & Walker, M. (2020). Do corporate press releases drive media coverage? *The British Accounting Review*, *52*(2), 100881. doi: 10.1016/j.bar.2020.100881.

Udayasankar, K. (2008). Corporate social responsibility and firm size. *Journal of Business Ethics*, *83*(2), 167–175.

Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, *105*(3), 581–606.

Zaman, R., Bahadar, S., Kayani, U. N., & Arslan, M. (2018). Role of media and independent directors in corporate transparency and disclosure: Evidence from an emerging economy. *Corporate Governance: The International Journal of Business in Society*, *18*(5), 858–885.

Zaman, R., Atawnah, N., Baghdadi, G. A., & Liu, J. (2021). Fiduciary duty or loyalty? Evidence from co-opted boards and corporate misconduct. *Journal of Corporate Finance*, *70*, 102066.

Zaman, R., Farooq, M. B., Khalid, F., & Mahmood, Z. (2021). Examining the extent of and determinants for sustainability assurance quality: The role of audit committees. *Business Strategy and the Environment*, *30*(7), 2887–2906.

Zaman, R., Jain, T., Samara, G., & Jamali, D. (2020). Corporate governance meets corporate social responsibility: Mapping the interface. *Business & Society*. doi: 10.1177/0007650320973415.

Zaman, R., Nadeem, M., & Carvajal, M. (2021). Corporate governance and corporate social responsibility synergies: Evidence from New Zealand. *Meditari Accountancy Research*, *29*(1), 135–160.

Appendix

Table A1. Definition and measurement of variables

Variable	Definition and measurement
$CSR\ Disclosure_{i,t}$	To measure the construct for corporate social responsibility, we applied computer-aided textual analysis (CATA) to gauge the extent to which the press releases, issued by NZX listed firms during the ongoing COVID-19 crisis, emphasised the multidimensional CSR linguistic themes, as developed by Pencle and Mălăescu (2016)
$ROLL\_CSR_{i,t}$	The 5-day rolling average of the $CSR\ Disclosure_{i,t}$
$COVID_{NZ,t}$	The growth rate of the population-adjusted cumulative sum of confirmed cases in New Zealand on a specific day
$ROLL\_COVID_{NZ,t}$	The 5-day rolling average of the $COVID_{NZ,t}$
$RANGE_{i,t}$	The difference between the daily high and low stock price of the firm i on day t
$ILLIQ_{i,t}$	Amihud liquidity ratio defined as the daily ratio of absolute stock return to its dollar volume averaged over a specified period
$PROF_{i,t}$	Profitability is the ratio of net income to total assets
$LEV_{i,t}$	Leverage is the ratio of total debt to total assets
$SIZE_{i,t}$	Firm size is measured as the natural log of the total assets
$AGE_{j,t}$	Firm age is measured as the number of years since the founding year of the firm
$BETA_{NZ,t}^{MKT}$	The time-varying beta of the market factor from the Carhart four-factor models
$BETA_{NZ,t}^{SMB}$	The time-varying beta of the size factor from the Carhart four-factor model
$BETA_{NZ,t}^{HML}$	The time-varying beta of the value factor from the Carhart four-factor model
$BETA_{NZ,t}^{MOM}$	The time-varying beta of the momentum factor from the Carhart four-factor model
$WOMEN_{i,t}$	Percentage of women on the board
$INDIR_{i,t}$	Percentage of independent directors on the board
$BSIZE_{i,t}$	Total number of directors on the board
$DUAL_{i,t}$	It is measured as a dummy variable, assigned 1 if the CEO simultaneously holds the position of chairman of the board, 0 otherwise

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