Does mandatory ESG disclosure play a role in NGOs' decisions on which companies to target with shaming campaigns? – Evidence from the Dodd-Frank Act

Abstract. This paper is one of the first to undertake an empirical analysis of stakeholder behavior. It examines whether NGOs consider the disclosure of ESG information required by Section 1503 of the Dodd-Frank Act. The Act requires SEC-registered mining companies to disclose mine safety records in their annual reports. Since these records are already publicly available through the MSHA institution, the incremental effect of this information in financial reports on NGO campaigning can be isolated. In a Difference in Differences Analysis, mines that are covered by Section 1503 can be compared to mines that are not. The analysis does not demonstrate a causal effect between the disclosure of mine safety records and an increased likelihood of the mine in question being targeted by an NGO. This has implications for the effectiveness of the Act and mandatory ESG disclosure in general.

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1. Introduction

The Dodd-Frank Wall Street Reform and Consumer Protection Act (hereinafter referred to as the Dodd-Frank Act) was introduced by policymakers in 2010 to address the Securities and Exchange Commission's (SEC) core values of ensuring a fair and safe financial market (e.g., U.S. Securities and Exchange Commission, 2010; Lynn, 2011). In addition to financial disclosure rules, Section 1503 was announced on the 21st of December 2011, requiring SEC-registered companies owning a U.S. mine to disclose information on mining safety and health in their quarterly and annual reports. Policymakers have since received criticism and proposals for reform but continue to defend the original draft. Numerous research already focused on the real effects of mandated ESG[1] disclosure, much like information on mine safety issues. However, there has not been reliable evidence found yet, whether a notion such as Section 1503 of the Dodd-Frank Act can help make U.S. mines safer. In the mining industry, there are already several incentive systems that sanction dangerous and immoral activities. For instance, miners demand a higher compensatory wage for taking on more hazardous work (Ruffennach, 2002). On top of that various stakeholders might scrutinize mines with safety issues. Whether stakeholders such as non-governmental organizations (NGOs) respond appropriately to the mandated disclosure of mine safety, may explain any real effects on companies' behavior, a capital market reaction, and therefore the stakeholder theory in general. This leads to the research question as follows:

RQ: *Does mandatory ESG disclosure play a role in NGOs' decisions on which companies to target with shaming campaigns?*

This paper examines the impact of mine safety disclosure (MSD) on NGOs' decision on which company to target by comparing mentions of U.S. mines owned by SEC-registered companies with those of other companies in shaming campaigns before and after the introduction of Section 1503. For this, a Difference in Differences (DiD) Analysis around the date Section 1503 became effective is conducted. Thus, the event of interest is the 27th of January 2012. The main feature of this research is that the mandated MSD in the financial reports of SEC-registered companies is already publicly available on the website of the Mine Safety and Health Administration (MSHA). Therefore, the introduction of Section 1503 implies that the MSD in the financial report has an additional impact independent from the first-time publication.

For the sample, all mines in the U.S. must be identified and further divided into mines owned by SEC-registered companies and therefore regulated by any SEC law, and all others. The Treatment Group will thus consist of mines subject to Section 1503 of the Dodd-Frank Act. In

[1] Notably, many articles, disciplines, and industries use the terms Corporate Social Responsibility (CSR) or Corporate Social Activities (CSA) rather than Environmental, Social, and Governance (ESG). For example, articles in accounting and finance tend to prefer ESG, whereas sustainability in mining, operations, and supply chain management tend to use CSR. In this paper, the terms CSR, CSA, and ESG are used interchangeably and without differentiation.

a first step, the MSHA Mine Record is utilized to compile a list of 6,282 active U.S. mines. Secondly, the selection of 151 SEC-registered mining companies is based on research done by Christensen et al. (2017). Combining both data, the opacity of the U.S. mining sector becomes a challenge, as in some cases the companies registered with the SEC are not clearly linked to the mines. Therefore, only mines that can be associated with the name of the SEC-registered parent company are selected. This results in a Treatment Sample of 1,125 mines. To consider the Parallel Trend Assumption of the DiD Analysis, these mines are matched with 1,125 U.S. mines that are similar in size, type, and resource to form the Control Group. Consequently, the overall sample consists of 2,250 U.S. mines.

Furthermore, NGO campaigns that focus on this sample need to be identified. For this step, the sample constructed by Hatte and Koenig (2020) is utilized as it consists of raw data from SIGWATCH. SIGWATCH is one of the first databanks collecting information on NGOs. For the DiD Analysis, campaigning data from 2010 to 2013 is necessary. This allows for the consideration of a respective two-year period before and after the introduction of Section 1503 of the Dodd-Frank Act. Within this timeframe, SIGWATCH includes 997 campaigns that focus on the mine sample. Whilst combining the mine sample with observations on NGOs' campaigns, a three-dimensional dataset is generated containing observations specific to NGO *i,* mine *j,* and year *t*.

The results of the DiD Analysis suggest that the introduction of Section 1503 of the Dodd-Frank Act has no significant effect on the probability that a U.S. mine receives more attention from NGOs and is mentioned in more campaigns. This questions the effectiveness of the law. As NGOs do not seem to consider the MSD in the annual reports, the law might not provide additional incentives for the respective mines to improve safety measures. It should be noted that future research could focus on other stakeholders to gain further insight into the effectiveness of Section 1503. On top of that, the results indicate that NGOs do not use annual reports as their main source of information on ESG activities. This does not seem to be impacted by a reporting mandate. Overall, general conclusions from this paper should be formulated with caution as only the U.S. mining sector is studied and other studies analyzing NGO campaign activities should be considered.

This paper can be embedded in multiple literature strands. First and foremost, it focuses on ESG disclosure in the form of the mandated inclusion of mine safety records in the annual reports of SEC-registered companies. Thus, it contributes to the literature examining mandatory ESG disclosure and its real effects. Moreover, the focus lies on whether NGOs consider MSD in their decision. NGOs can be impactful stakeholders of a company, influencing its public reputation and future cash flow (e.g., Nikkhah & Redzuan, 2010; Spar & La Mure, 2003; Sisaye, 2021; She, 2022; Ulleberg, 2009; Zohir, 2004). Hence, companies may be anticipating NGO activism in their reports on ESG activities. Therefore, this paper not only contributes to the literature on stakeholders and the stakeholder theory in general but furthermore focuses specifically on NGOs. The key contribution here is the unique construction of a dataset, which allows for a quantitative study of NGO campaigning concerning non-financial disclosure. This dataset is based on combined information from the two samples of Christensen et al. (2017) and Hatte

and Koenig (2020). The results of the constructed DiD Analysis suggest that NGO campaigning is not influenced by the additional mandated MSD through Section 1503 of the Dodd-Frank Act. This provides insight into the overall effectiveness of the Act and implies that NGOs do not use ESG disclosure in annual reports as their main source of information.

2. Theoretical Background

2.1. The U.S. Mining Industry

The mining industry in the U.S. has historically been of economic importance and at the same time has raised various environmental and social concerns due to the extraction of natural resources and the working conditions of miners. In a report published in 2021, the National Mining Association (NMA) states that the mining industry in the U.S. provides a total of 1,379,227 jobs and contributes $199,002 million to GDP (NMA, 2021). However, in the last high-profile mining disasters that have occurred since 2000 a total of 76 miners were fatally injured or trapped for several hours underground (MSHA, 2023 June 22). To this day, the mining sector remains one of the most heavily regulated sectors when it comes to the treatment and safety of its miners (e.g., Fuisz-Kehrbach, 2015; Franken & Schütte, 2022; Olsen, Awuah-Offei & Bumblauskas, 2021). There exist national reporting requirements, as well as international regulations and voluntary disclosure, aimed at reducing the opacity of mining conditions and identifying the ownership of a mine. Researchers found that mines commonly report safety issues, either to reassure stakeholders that safety is taken seriously or to legitimize themselves after an incident (e.g., Coetzee & van Staden, 2011; Vourvachis et al., 2016; Yakovleva & Vazquez-Brust, 2012).

The two main institutions operating in the U.S. mining industry are the Occupational Safety and Health Administration (OSHA) and its sister agency, the Mine Safety and Health Administration (MSHA). MSHA inspects surface mines at least twice a year and underground mines at least four times a year. Additional inspections are required if there are complaints about safety. The inspection reports have been published on MSHA's website since 2000. Ruffennach (2002) criticizes the two institutions in his policy analysis and observes that policy interventions are often only triggered after catastrophic events. This includes the Upper Big Branch Disaster, which killed twenty-nine miners in West Virginia on the 5th of April 2010 (MSHA, 2023 June 22). As a reaction, policymakers introduced new sections on MSD to the Dodd-Frank Act which otherwise primarily focuses on the financial service sector. Policy statements imply that Section 1503 of the Dodd-Frank Act was especially intended to improve mine safety rather than inform the financial market (Lynn, 2011). Now, U.S. mines subject to the Act are required to disclose citations or orders issued by MSHA concerning mine safety (U.S. Securities and Exchange Commission, 2010). According to Section 1503(a), Forms 10K and 10Q should annually list mine safety violations. In addition, Section 1503(b) obliges mines to immediately release an 8K Report in the event of an Immediate Danger Order (IDO). The information disclosed complies with the health requirements of the Federal Mine Safety and Health Act of 1977 (Mine Act).

2.2. General Objective of an ESG Disclosure Mandate

The literature on ESG disclosure is a rapidly growing body as the discussion on more regulated disclosure intensifies. The research to date can be split into two strands focusing either on shareholders or stakeholders and their reaction to ESG disclosure (e.g., Berg, Koelbel & Rigobon, 2022; Du, Bhattacharya & Sen, 2010; Lewin & Warren, 2023; Serafeim & Yoon, 2022; Tsang, Frost & Cao, 2022). Quintessentially, the literature builds on the concept that disclosure eliminates information asymmetries (Healy & Palepu, 2001). Overall, the objective of an ESG disclosure mandate is widely regarded as informing both shareholders and stakeholders about a company's ESG activities, and indirectly incentivizing the company to act responsibly (e.g., Aresu, Hooghiemstra & Melis, 2022; Raith, 2023; Baumüller & Grbenic, 2021; Christensen, Hail & Leuz, 2021). As some ESG matters are by nature non-empirical and quite new concepts, Christensen, Serafeim, and Sikochi (2022) find that companies that disclose more ESG information have for instance a greater discrepancy in ESG ratings. This ultimately leads to the conclusion that information asymmetry cannot be resolved. Additionally, some literature addresses the question of whether additional voluntary ESG disclosure is reliable and to what extent shareholders, stakeholders, and rating agencies are misled (e.g., Berg et al., 2021; Berg, Koelbel & Rigobon, 2022; Christensen et al., 2022; Larcker et al., 2022). The different findings on the effect of ESG disclosure ultimately influence the understanding of a company's incentive to disclose information and the objective of regulators in developing a disclosure mandate.

2.3. Shareholders, Stakeholders, and Their Impact on Disclosing Companies

In the relationship between companies and their shareholders, shareholders enable external financing (e.g., see Friedman, 1970; Jensen, 2001). This leads at a very simplified level to the main objective of a company to maximize its value. On the one hand, the short-term investments required for ESG activities may reduce the economic benefits and ESG activities are therefore not in the interest of shareholders (Nie, Meng & Wang, 2019). On the other hand, ESG activities can have various effects on the future value of a company (Tsang, Frost & Cao, 2022). Although the literature either observes stakeholders' or shareholders' reactions to ESG news, the two mechanisms are arguably linked.

Building on the stakeholder theory, firms can have larger future cash flows due to approval by key stakeholders (Freeman, 1984; Freeman et al., 2010). For instance, environmentally conscious customers, employees who value diversity, NGOs, or regulators are more likely to support responsible organizations (e.g., Du, Bhattacharya & Sen, 2010; Jia & Zhang, 2014). An irresponsible company might lose customers or has trouble finding the right employees (e.g., Choi et al., 2022; Du, Bhattacharya & Sen, 2010). This implies that firms can do well by doing good and therefore should be aware of their responsibilities in dealing with the needs of their stakeholders (Bénabou &Tirole, 2010). Additionally, researchers assume that companies factor in the risk of public scrutiny, of being targeted by activists or getting fined by adapting their actions (e.g., Christensen et al., 2017; Li et al. 2021). As stakeholders presumably consider companies' non-financial reports and act accordingly (e.g., Aresu, Hooghiemstra & Melis,

2022; Baumüller & Grbenic, 2021; Raith, 2023), various researchers conclude that reporting companies anticipate an appropriate stakeholder reaction regarding disclosed CSR information (e.g., Christensen et al. 2017; Christensen, Hail & Leuz, 2019; Capelle-Blancard & Petit, 2019).

Following Fama's theory that the capital market prices in all available information (Fama, 1970), the inspection of shareholders sufficiently portrays all consequences a company suffers due to ESG activities and its reporting (e.g., Friedman, 1970; Freeman et al., 2010; Jensen, 2001; Kitzmueller & Shimshack, 2012; Serafeim & Yoon, 2022). This would include the relationship between a company and its stakeholders. As a result, most of the literature to date has focused on shareholders and their reactions to ESG disclosure by examining the reaction of the stock market. For instance, Christensen et al. (2017) examined the potential real effects of Section 1503 of the Dodd-Frank Act. The authors found that labor productivity was reduced and there were fewer injuries to report. They base this on the argument that political costs, reputational concerns, and activism by investors or other parties increase for mines subject to the law which provides an incentive for management to improve safety measures. It is noticeable that the paper builds on the stakeholder theory but contains no empirical evidence of stakeholder behavior.

2.4. The Role of NGOs in Disciplining Irresponsible Companies

While ESG issues are gaining in importance, shareholders and stakeholders are less aware of initiatives than expected (e.g., Bhattacharya & Sen 2004; Sen, Bhattacharya & Korschun, 2006). As a result, it is crucial to better understand stakeholder behavior and the channels through which corporate actions are made public. Examples of external channels include news channels, social media, and activists' campaigns (e.g., Capelle-Blancard & Petit, 2019; Du, Bhattacharya & Sen, 2010; Dobija et al., 2023). Researchers generally agree on the importance of NGOs and their key role in pressuring irresponsible companies (e.g., Nikkhah & Redzuan, 2010; Spar & La Mure, 2003; Sisaye, 2021; She, 2022; Ulleberg, 2009; Zohir, 2004). NGOs gain the attention of corporations through media attention, the strategic use of alliances, and stakeholder engagement, as they can influence the public image of the company and inform third parties. Bach and Stark (2004) describe NGOs as networked, molecular structures and argue that they build knowledge communities. As a result, NGOs can affect the flow of capital and the pricing of a company (Bloomfield, 2014). Unsatisfying outcomes of political procedures and governance that involves NGOs are due to failures of the participatory process (Irvin & Stansbury, 2004).

It could be assumed that changes in voluntary ESG disclosure may occur as a response to changes in societal expectations and priorities, but some research concludes that corporations often legitimize themselves or build a favorable reputation (e.g., Cooper & Owen, 2007; Danastas & Gadenne, 2006; Owen, Swift & Hunt 2001). Mandatory ESG disclosure on the side may provide more reliable information. Tilt (1994) even finds annual reports to be the sole source of social and environmental information as they seem more creditable. However, with companies' websites and an increasing number of environmental reports, the focus on annual reports may have shifted (Danastas & Gadenne, 2006).

Acting as intermediaries, NGOs need to inform themselves about irresponsible companies through various sources. Quantitative studies on this are rare, nevertheless, there is a branch of literature that establishes a link between NGOs and companies' ESG disclosure. Danastas and Gadenne (2006) argue that NGOs view CSR disclosure in annual reports as low in credibility as well as insufficient and conclude that NGOs use alternative channels to inform themselves. This conflicts with the objective of a disclosure mandate for companies' reports to indirectly incentivize responsible behavior. If NGOs and other stakeholders fail to consider them, the management may not be encouraged enough to act more responsibly. Other research, such as that by Hatte and Koenig (2020) analyzes how NGOs monitor global value chains and find a strong bias towards geographical distance, country borders, and language barriers. NGOs strongly target domestic companies or foreign companies with domestic operations. Mac Sheoin (2014) focuses on the history, scale, tactics, and success rate of anti-corporate campaigns, and yet fails to consider the relevance of non-financial reports in NGOs' decision-making process on which companies to target in the first place. The limited number of studies conducted can be explained by the difficulty in determining the degree of NGOs' response, satisfaction, or lack of response to corporate disclosure.

3. Hypothesis Development

The mining industry in general is very sensitive to issues of safety or natural resource extraction and is already the focus of various NGOs (e.g., Lauwo, Otusanya & Bakre, 2016; Phiri, Mantzari & Gleadle, 2019). The implementation of Section 1503 of the Dodd-Frank Act is an opportune event to better understand the effect of mandated ESG disclosure on NGOs' campaigning and could help to comprehend any real effects. Section 1503 obliges SEC-registered issuers that own U.S. mines to disclose mine safety issues in the annual report, while the information is already publicly available on MSHA's website (U.S. Securities and Exchange Commission, 2010; MSHA, 2023). On top of that, mine safety issues are also available for mining companies that do not have to consider the mandate. Reporting companies will anticipate the economic consequences of shaming campaigns and act responsibly if NGOs consider the MSD. MSHA reports have been released since 2000 and are updated every 24 hours. Apart from the immediate publication of an 8-K Filing in the event of an IDO, SEC-registered companies' financial reports are only available annually. This makes the MSHA website a timelier source of information for NGOs. Nevertheless, policymakers defend Section 1503 arguing that MSD has additional effects that have not been achieved by the first-time publication on the MSHA's website (Lynn, 2011). If MSD about mines owned by SEC-registered companies alongside official MSHA records influences NGOs' decisions to target a mine, the mandatory inclusion in the financial reports plays a key role. In statistical terms, it is in these circumstances possible to isolate and assess the incremental effect of MSD. Therefore, this paper focuses on the hypothesis as follows:

H1: *Mines subject to Section 1503 of the Dodd-Frank Act are more likely to get scrutinized by NGOs.*

Danastas and Gadenne (2006) find in their paper that NGOs do not put a lot of trust in ESG disclosure of companies and therefore fail to consider annual reports in their decision process of which company to shame. A mandate like Section 1503 regulates what a company is obliged to disclose. This can help to overcome the barrier of mistrust and could lead to NGOs using the available company reports. Moreover, the inclusion of MSD in the financial reports can make it more assessable and comparable. Even if a mine-owning company is not explicitly screened for mine safety issues, the addition in the financial reports makes a generally investigating party still aware. As the MSD is only mandated in the reports of SEC-registered mining companies, the decision process of NGOs on which mines to target in a campaign could be distorted.

On top of that, Hatte and Koenig (2020) argue that NGOs have a strong home bias and a high sensitivity to language barriers, which implies that NGOs are biased by the availability of information at the international level. Therefore, on a smaller scale, NGOs may be more inclined to target mines that offer insight into safety issues and ownership with low information acquisition costs. Additionally, other parties such as news media can inform themselves with lower acquisition costs as well (Christensen et al., 2017). As NGOs obtain information and become aware of problems through different channels, this could also lead to an indirect effect on NGO campaigning.

4. Methodology

4.1. Sample Selection

To test Hypothesis H1, the total sample must contain all U.S. mines which are subject to Section 1503 of the Dodd-Frank Act and those that are not. To achieve this, the sample construction goes through a series of steps. First, it is essential to identify all mines included in the U.S. mining industry. For this, the U.S. Department of Labor's MSHA Open Government Data website (MSHA, 2023 May 24) can be utilized. Since Section 1503 of the Dodd-Frank Act requires mining companies to disclose mining safety hazards and violations as reported by MSHA, the use of its databases to identify U.S. mines is an obvious option. The website compiles a variety of health and safety data sets for mining operations. The MSHA Mine Record is a list of all coal and metal/non-metal mines under MSHA jurisdiction since early 1970. The list contains information on the current status of each mine, the controller as well as the operator, commodity numbers, and physical characteristics. In total, the MSHA Mine Record consists of 87,537 mines. Filtering out all mines that have updated their status as active leaves 6,282 entries. The Column CURRENT_CONTROLLER_NAME lists the legal entity of a mine so either the company or the name of a person who currently owns that mine. There are a total of 2,914 legal entities, owning on average around 2 active mines.

In the next step, it is important to assess which mines are subject to Section 1503. This paper builds on the sample of SEC-registered mining companies constructed by Christensen et al. in their paper from 2017. The authors identified 151 SEC-registered companies with mine-related

annual reports.[2] As addressed in Appendix B, the legal entity of a mine included in the MSHA Mine Record is in several cases not identical with the company registered with the SEC. To handle this issue, the 151 SEC-registered companies are hand-matched to the legal entities of the 6,282 active U.S. mines extracted from the MSHA Mine Record. Those mines with a legal entity that is registered under the same or similar name with SEC form the Treatment Group. This step results in 61 out of the 151 SEC-registered companies that could be linked by name to the MSHA Mine Record. These companies own 1,125 active U.S. mines in total, which form the Treatment Group. From the MSHA Mine Record, 5,150 mines were subsequently not filtered out. To check whether these mines form a suitable Control Group for the empirical analysis, they can be compared with the Treatment Group based on the mines' most important characteristics. Table 1 illustrates the Descriptive Statistics of the Treatment Group and the 5,150 remaining MSHA Mines. As this study is based on the sample of SEC-registered mining companies constructed by Christensen et al. (2017), it faces the same issue that the mines in the Treatment Group differ significantly from other mines included in the MSHA Mine Record. The Treatment Group includes a larger number of metal mines. Moreover, mines belonging to the Treatment Group employ on average more miners and have fewer underground mining activities.

Table 1

Descriptive Statistics for the Treatment Group and the remaining MSHA Mines.

Panel A: Treatment Group (N = 1,125)

Variable	n	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
COAL_METAL_IND	1,125	0.000	1.000	1.000	0.879	1.000	1.000
CURRENT_MINE_TYPE	1,125	0.000	1.000	1.000	0.823	1.000	1.000
HOURS_PER_SHIFT	1,125	0.000	8.000	9.000	9.039	10.000	21.000
NO_EMPLOYEES	1,125	1.000	8.000	16.000	52.980	36.000	3,001.00

Panel B: Remaining MSHA Mines (N = 5,150)

Variable	n	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
COAL_METAL_IND	5,150	0.000	1.000	1.000	0.855	1.000	1.000
CURRENT_MINE_TYPE	5,150	0.000	1.000	1.000	0.847	1.000	1.000
HOURS_PER_SHIFT	5,150	0.000	8.000	8.000	8.784	10.000	19.000
NO_EMPLOYEES	5,150	1.000	4.000	7.000	23.860	17.000	2,982.00

***Note**. MSHA sample of 6,282 active U.S. mines was reduced to 6,275 observations due to missing values; Variables used are listed and defined in Appendix A.*

Christensen et al. (2017) address this issue in their Appendix by matching their Control Group to the Treatment Group. Thus, the Treatment Group in this paper is also matched with U.S. mines of comparable size, type, and mined resources to form an appropriate Control Group.

[2] Christensen et al. (2017) identify mine safety filings using a comprehensive text-based search on directEDGAR and SeekEDGAR. The terms "Mine Safety" and "Section 104" are the most used citations, allowing the authors to construct a list of SEC-registered companies that are related to mines. The authors acknowledge possible shortcomings of their sample construction in their appendix.

The matching procedure aims to reduce differences and establish a balance between the most important mine characteristics. For empirical analysis, this allows for a more reliable estimate of the treatment effect. Consequently, a Control Group of 1,125 matched mines is formed. Therefore, the entire sample set consists of 2,250 U.S. mines. Table 2 allows an assessment of the balance achieved after matching and indicates whether the variables are similar between the matched Treatment and Control Groups. It contains information on the means of the Treatment and Control Group, mean differences as well as the mean and maxima of the empirical Cumulative Distribution Function (eCDF) of the mines' most important characteristics. Indications for a successful matching are the decreased mean differences.

Table 2

Summary Statistics for the MSHA Mine Sample and the Matched Sample.

Panel A: MSHA Mine Sample (N = 6,275)					
Variable	**Mean Treatement**	**Mean Control**	**Mean Diff.**	**eCDF Mean**	**eCDF Max**
Distance	0.196	0.176	0.257	0.076	0.243
COAL_METAL_IND	0.879	0.855	0.075	0.025	0.024
CURRENT_ MINE_TYPE	0.823	0.847	-0.062	0.024	0.024
HOURS_PER_SHIFT	9.039	8.784	0.136	0.015	0.076
NO_EMPLOYEES	52.980	23.865	0.204	0.063	0.304

Panel B: Matched Sample (N = 2,250)

Variable	**Mean Treatment**	**Mean Control**	**Mean Diff.**	**eCDF Mean**	**eCDF Max**	**Pair Distance**
Distance	0.196	0.195	0.004	0.000	0.006	0.007
COAL_METAL_IND	0.879	0.908	-0.090	0.029	0.029	0.243
CURRENT_ MINE_TYPE	0.823	0.827	-0.009	0.004	0.004	0.303
HOURS_PER_SHIFT	9.039	9.067	-0.015	0.003	0.006	0.257
NO_EMPLOYEES	52.980	47.794	0.036	0.013	0.041	0.121

***Note**. Variables used are listed and defined in Appendix A.*

4.2. Data Retrieval on NGO Campaigns

This study additionally builds on the sample previously created in the work of Hatte and Koenig (2020) and detailed in Koenig (2017), as it contains raw data from SIGWATCH. The sample is utilized to identify those NGOs that campaign against our sample set of 2,250 U.S. mines. SIGWATCH is a consultancy that started collecting information on NGO campaigns[3] in 2010 (Sigwatch, 2023). The company tracks the messages and issues generated by NGO campaigns. The initiatives of more than 10,000 NGOs are monitored and quantified on an ongoing basis to

[3] A campaign is defined by SIGWATCH as the launch of a new public awareness initiative, a new target or tactic, a new publication or report, new litigation, or a direct action or street protest.

show how they are driving around 1,000 issues and to measure their potential impact on more than 20,000 companies, projects, and brands worldwide. The data is used by leading multinationals and investors in energy, chemicals, mining, FMCG, financial services, healthcare, retail, and communications to stay on top of new or growing material risks and changes in public and political opinion. SIGWATCH not only reports on the content and nature of campaigns but also quantifies these actions in terms of the level of targeting in industries and individual companies.

The empirical analysis focuses on a total timeframe of four years, from 2010 to 2013. During this period, a total of 25,323 NGO campaigns were listed by SIGWATCH. The event of interest is the 27th of January 2012, as explained in more detail in Chapter 4.3. The SIGWATCH data is structured annually but includes the date of the start of a campaign, thus the specific period before and after the 27th of January 2012 can be identified. Ultimately, 417 NGO campaigns were found that focus on the mine sample in the pre-period. In the post-period, there are a total of 580 NGO campaigns focusing on the mine sample. It is noteworthy that each campaign can be run by up to five individual NGOs that work together. To combine the NGO observations with the mine sample, all NGOs that have mentioned either the Control or the Treatment Group are identified. Between 2010 and 2013, 2,634 individual NGOs (working either in collaboration with other NGOs or alone) addressed the Treatment or Control Group in one or more campaigns. The number of NGOs involved in shaming campaigns increased over time by 16.75% from 1,845 NGOs active in the before period to 2,154 involved NGOs in the after. Then separate tables for each NGO *i* are constructed, listing the mines *j* that have been mentioned in a campaign in year *t* as well as the mines *j* that have not been scrutinized at that point in time. When combining all tables, observations are three-dimensional, specific to the mine *j*, the year *t*, and the NGO *i* contributing to a campaign.

4.3. Empirical Model

To answer the question of whether mandatory MSD plays a role in NGOs' decisions on which companies to target with shaming campaigns, a DiD Analysis can be used. The advantage of this research design is the causal implications of the results. Thus, Hypothesis H1 established in Chapter 3 can be translated to the following Logistic Regression:

$$\begin{aligned} Target_{i,j,t} = {} & \alpha + \beta * SEC_{i,j,t} + \gamma * DFA_{i,j,t} + \delta * SEC_{i,j,t} * DFA_{i,j,t} \\ & + \mu * NO\_EMPLOYEES_{i,j,t} + \nu * COAL\_METAL\_IND_{i,j,t} + \lambda * \\ & CURRENT\_MINE\_TYPE_{i,j,t} + \rho * HOURS\_PER\_SHIFT_{i,j,t} + \varepsilon \end{aligned} \quad (1)$$

Here, the event of relevance may be the 27th of January in 2012[4] when Section 1503 of the Dodd-Frank Act became effective (SEC, 2011 December 21). By comparing U.S. mines owned

[4] It should be noted that Section 1503 was publicly introduced on the 21st of December 2011. As this research aims to determine the impact of mandatory CSR disclosure on NGO behavior, the news of a new mandate has no implications yet. Therefore, it is important to consider the date on which the law officially comes into force as the relevant event.

by SEC-registered issuers with those that are not, it is possible to determine whether NGOs are targeting the mines due to mandatory MSD differently.

The DiD Analysis can be done at the mine or company level, as NGO campaigns target a company but focus on safety issues within the respective mines. On the one hand, the mine level allows us to consider specific mine characteristics. These characteristics cannot be considered on a company level, as one company may own several distinct mines. On the other hand, it is quite difficult to determine which mine an NGO focuses on in a campaign. This paper conducts the DiD Analysis at a mine level, much like Christensen et al. in their paper in 2017. If a targeted company owns several mines, the NGO is assumed to target each of the mines involved equally.

The Logistic Regression (1) is three-dimensional. The indices describe the year *t*, mine *j,* and NGO *i*. By introducing the third dimension it can be considered that a shaming campaign involves up to five distinct NGOs. The dependent variable $Target_{i,j,t}$ helps to quantify the scrutiny a mine is under by an NGO as it describes the probability for whether a U.S. mine is mentioned in an NGO campaign. Thus, $Target_{i,j,t}$ is a dummy variable that equals 1 when a mine *j* is included in a campaign by NGO *i* in the year *t*. For the DiD Design, the Logistic Regression (1) contains a group and a time variable. $SEC_{i,j,t}$ identifies the Treatment and Control Group. $SEC_{i,j,t}$ is equal to 1 for the Treatment Group. $DF_{i,j,t}$ is hence the time variable. $DF_{i,j,t}$ is equal to 0 for the two-year timeframe before the 27th of January in 2012 and 1 for the following two years. The interaction term $SEC_{i,j,t} * DF_{i,j,t}$ shows the periodic difference between the Treatment and Control Group and is the term factor of interest. By comparing the two groups in the before and after periods, time trends can be eliminated, and the causal effect of the MSD remains.

Additionally, Linear Regression (1) includes several control variables to account for potential confounding variables. The variable $NO\_EMPLOYEES_{i,j,t}$ equals the number of workers employed in a mine and thus indicates the size of a mine. It is reasonable to assume that larger mines may be targeted more frequently than smaller mines. This may be because with more mineworkers, public interest in a mine increases. In addition, NGOs may be more likely to learn about accidents at larger mines, as news travel faster with more people involved. The variable $COAL\_METAL\_IND_{i,j,t}$ is a reference category code indicating whether a mine extracts coal or metal/non-metal. There are different processes and hazards depending on the resource being mined. In addition, NGOs may consider environmental concerns related to the resource being mined and are more inclined to target mines that mine an inherently limited resource or a mining process that emits more CO2. The variable $CURRENT\_MINE\_TYPE_{i,j,t}$ is another reference category code that indicates whether a mine is underground or on the surface. Underground mines are considered more dangerous because miners must work in more extreme conditions. For example, the hazards of methane and dust-containing volatiles only apply to underground metal/non-metal mines. Therefore, NGOs may treat underground and surface mines differently. The final control variable $HOURS\_PER\_SHIFT_{i,j,t}$ corresponds to the number of hours per shift in a mine. This variable gives information about the treatment of the mine workers. It indicates

how much power the miners' union has because miners accept worse working conditions the longer the shifts. Thus, an NGO could more frequently target a mine where miners have to agree to worst working conditions, in order to highlight the problem and support the union. Overall, the control variables describe various mine characteristics that can affect an NGO's decision on which mine to mention in a campaign. All variables used are listed and further specified in Appendix A.

4.4. Parallel Trend Assumption

The fundamental Parallel Trend Assumption of a DiD Analysis helps to create a counterfactual scenario. If the Treatment and Control Group would have developed similarly without the treatment, it is possible to link any difference observed after the treatment to the causal effect of the treatment itself. If the mines in the Treatment and Control Group differ significantly, it can be assumed that the NGOs are addressing them quite differently overall. As the SIGWATCH database only begins in 2010, the Parallel Trend Assumption can only be tested for the two years prior to the implementation of Section 1503 of the Dodd-Frank Act.

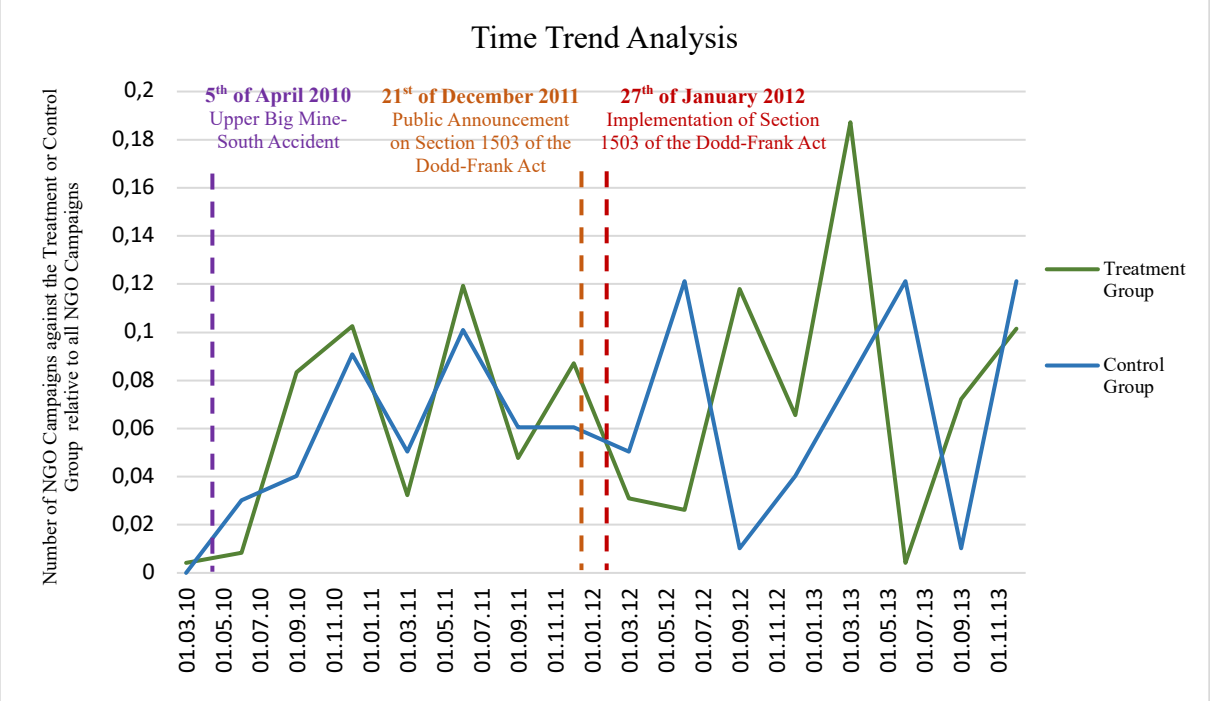

Fig. 1. Time Trend Analysis of the Treatment and Control Group, 2010 – 2013.

Figure 1 illustrates univariate trends separately for the Treatment and Control Group in a four-year frame before and after the implementation of Section 1503 of the Dodd-Frank Act. In the graph, the number of NGO campaigns against the Treatment and Control Group in relation to the total number of NGO campaigns against the two samples is plotted. This makes it possible to visualize any trend over time in NGO campaigns against the Treatment and Control Group. The relative number of campaigns against the Treatment Group is shown with a green line, while the relative number of campaigns against the Control Group is shown with a blue line. Important events in the U.S. mining industry during 2010 and 2013 are marked with vertical

lines in purple, orange, and red. The first important event is the Upper Big Branch Mine-South Incident on the 5th of April 2010 which motivated the introduction of Section 1503 in the first place. The incident involved a massive coal dust explosion at a coal mine in Montcoal, West Virginia, which killed 29 miners (MSHA, 2010). It was the largest mine accident in the U.S. in 40 years. The second important event is the 21st of December 2011, when Section 1503 was first announced by the SEC in a press release (SEC, 2011, December 21). The last important event, which is also of interest for the DiD Analysis, is the 27th of January 2012, the day on which Section 1503 became effective.

Visual inspection shows that the Treatment and Control Group follow similar trends in the two years prior to the 27th of January 2012. The assumption of a parallel trend can therefore be made. However, it is noticeable that the Treatment Group seems to be more sensitive to NGO attention. On average, the number of campaigns against the sample increased while there seems to be a significant decrease in NGO campaigns in the first and third quarters of 2011. Further analysis of NGO behavior in general and in the mining industry could provide insight into possible explanations.

5. Empirical Results

5.1. Regression Result

The DiD Analysis is based on the Logistic Regression (1) since the dependent variable $Target_{i,j,t}$ is probability-based and binary. The output is therefore converted to log odds (also called logit). A log odd represents the logarithm of the odds of an event occurring. The odds of a U.S. mine *j* getting mentioned in a campaign by NGO *i* in year *t* is defined as the probability of being mentioned divided by the probability of not being mentioned.

The findings of the Logistic Regression (1) are illustrated in Table 3. The columns include the estimates of the regression coefficients, their standard errors, Wald χ^2, and p-values as well as the odd ratios. The Estimate column provides information about the relationship between the independent variables and the log-odds of the binary variable $Target_{i,j,t}$. Each estimate represents the estimated change in the log odds of the outcome for a one-unit increase in the corresponding independent variable, holding other variables constant. This value can be both positive or negative, indicating the direction and strength of the relationship. The standard errors indicate the variability or uncertainty associated with the coefficient estimate. Smaller standard errors suggest more precise estimates. The Wald χ^2 value is calculated as the ratio of the estimate to its standard error. It is the test statistic for the individual predictor variable in a Logistic Regression Model and therefore measures how many standard errors the estimate is away from zero. Larger absolute Wald χ^2 values indicate stronger evidence against the null hypothesis of no effect. Thus, the associated p-value indicates the statistical significance of the estimates. To make the interpretation more intuitive, the log odds are converted back into odds ratios by exponentiating the regression coefficient. The odds ratios can be interpreted as the ratio of the odds of the outcome occurring in the Treatment Group compared to the Control

Group after an intervention. The odds ratio of a coefficient estimate provides information about the relative change in the odds of the outcome variable associated with a unit change of the respective independent variable.

Table 3

Logistic Regression Results from the Relationship between the Inclusion of MSD mandated by Section 1503 of the Dodd-Frank Act and the Probability of the respective Mines to get targeted by an NGO.

Variable	Dependent Variable = Target				
	Estimate	**Std. Error**	**Wald χ^2**	**Pr(>|z|)**	**OR**
(Intercept)	-5.649 ***	0.183	-30.922	< 2e-16	0.003
SEC	2.599 ***	0.158	16.476	< 2e-16	13.446
DFA	0.009	0.203	0.043	0.966	1.009
COAL_METAL_IND	-3.128 ***	0.065	-48.444	< 2e-16	0.044
CURRENT_ MINE_TYPE	-0.187 ***	0.055	-3.385	0.001	0.830
HOURS_PER_SHIFT	-0.002	0.011	-0.218	0.828	0.998
NO_EMPLOYEES	0.001 ***	0.000	15.504	< 2e-16	1.001
SEC * DFA	0.113	0.209	0.541	0.589	1.120

Null Deviance	22,852 on 407,509 Degrees of Freedom
Residual Deviance	16,787 on 407,502 Degrees of Freedom
AIC	16,803
Number of Fisher Scoring	10
N	407,510
McFadden's R-squared	0.265

Note**. All variables have the dimensions mine j, time t and NGO i; Variables are listed and defined in Appendix A; Signif. codes: 0 '' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.*

The Intercept represents the baseline log-odds of $Target_{i,j,t}$ of the Control Group in the before period. The estimate describes a significant and negative relationship between the Control Group and the log odds of the outcome variable $Target_{i,j,t}$. The coefficient of SEC captures the change in the log odds of the outcome between the Treatment and Control Groups. The SEC estimate indicates that the log odds for the Treatment Group are 2.599 times higher than for the Control Group. The more intuitive odds ratio equals 13.446. This value indicates that the odds of a mine *j* getting targeted by the NGO *i* are around 13 times higher for the Treatment Group compared to the Control Group. Since the Treatment Group in this study only includes mines owned by a legal entity registered under the same name with the SEC, it must be considered that this may have an effect. Since the ownership of these mines is available without incurring higher acquisition costs, NGOs may be more inclined to target them. That would suggest that NGOs favor easy access to information when deciding which mines to include in a new campaign. This observation is quite surprising, as mines that can be easily associated with their SEC-registered parent company do appear more transparent and thus less concerning.

The coefficient for both the time variable $DFA_{i,j,t}$, as well as the interaction term $SEC_{i,j,t} * DFA_{i,j,t}$, are not significant. Thus, the additional MSD by mines subject to Section 1503 of the Dodd-Frank Act has a negligible effect on the outcome variable and Hypothesis H1 can be rejected. NGOs do not seem to consider the mandated disclosure in annual reports before starting a shaming campaign. On top of that, the Act did not impact the campaigning against the Control Group either. This essentially implies that while NGOs are inclined to easy access towards for instance the ownership structure of a mine, alternative sources of information on mine safety are used. Thus, the mandated inclusion of mine safety issues does not bias NGOs to target the Treatment Group more. This confirms some previous studies that have examined the use of annual reports by NGOs. For instance, Danastas and Gadenne (2006) find that NGOs do not use annual reports as a preferred medium to inform themselves about CSR activities. The authors sent out questionnaires to social and environmental NGOs in Australia and found the responses that NGOs are overwhelmingly skeptical of the CSR information being reported and view them as low in credibility. This does not seem to change when introducing a mandate.

Other factors that seem to impact the outcome variable are the resource that is mined, the number of miners employed as well as whether the mine is on the surface or underground. The estimate of -3.128 for the variable $COAL\_METAL\_IND_{i,j,t}$ suggests a substantial decrease in the log odds of being mentioned in an NGO campaign for metal/non-metal mines compared to coal mines. The odds ratio of 0.044 indicates that the odds of being targeted by NGO *i* are significantly lower in metal/non-metal mines than in coal mines. The $CURRENT\_MINE\_TYPE_{i,j,t}$ estimate of -0.187 suggests a slight decrease in the log odds of the outcome variable $Target_{i,j,t}$ for surface mines compared to underground mines. Thus, the odds ratio of 0.830 indicates that the odds of being mentioned in a campaign that the NGO *i* participates in are lower in surface mines. These findings seem reasonable as most of the largest mine safety incidences reported by MSHA involve underground mines and coal mines (MSHA, 2023 June 22). This applies for instance to the Upper Big Branch Mine-South Incident on the 5th of April 2010 which motivated the introduction of Section 1503 in the first place. Finally, the $NO\_EMPLOYEES_{i,j,t}$ estimate of 0.001 suggests a minimal change in the log odds of the outcome for each additional worker employed. The odds ratio of 1.001 indicates a negligible impact on the odds of being included in a campaign for each additional worker.

5.2. Shortcomings and Potential Extensions

This paper has various shortcomings and can be extended by future research. First and foremost, the findings of the DiD Analysis should be further explored. The empirical analysis in this paper does not detect any effect through the implementation of Section 1503 of the Dodd-Frank Act on NGOs' campaigning. This implies that NGOs do not use annual reports in their decision process before starting a campaign and fail to consider mandated ESG disclosure. Future research could further deepen our insight into stakeholder behavior by investigating which information sources are mainly used and what influences this choice.

Additionally, the sample is limited to the U.S. mining sector. This limits the generalizability of the results, as mines in different countries and continents could differ significantly. Previous work such as that of Hatte and Koenig (2020) demonstrates that NGOs operate on a global scale, building networks across borders and shame companies in different countries. Thus, there are various unobservable influences on an NGOs decision process on when, where and against whom to start a campaign. In this research, confounding variables are addressed by introducing control variables that impact NGOs' campaigning with respect to the U.S. mining industry. Future research could expand on this notion by focusing on mining sectors from other countries, observing other industries that are highly scrutinized by NGOs, and examining campaigning on an international level. Furthermore, there is a limitation to the availability of observations on NGO campaigns. Since Section 1503 of the Dodd-Frank Act was introduced in early 2012 and the SIGWATCH database does not begin until 2010, observations for the period before the Act are limited to a two-year period.

Finally, this paper reaches the same shortcomings as Christensen et al. (2017), that the Treatment Group differs from other U.S. mines included in the MSHA Mine Record in terms of mine type and size. This is addressed by matching the Treatment and Control Group in terms of key characteristics that are also included in the Logistic Regression (1). However, the limited NGO data also restricts the extent to which the Parallel Trend Assumption can be tested for the DiD Analysis. Further analysis could expand the line of research on the relationship between mandatory CSR disclosure and NGOs by focusing on alternative frameworks that allow for the isolation of the incremental effect.

6. Conclusion

Increasingly, U.S. policymakers have used additional regulations to address issues beyond the SEC's core mission of informing and protecting investors and maintaining an efficient capital market (Lynn, 2011). For instance, the main objective of Section 1503 of the Dodd-Frank Act is to make mines safer by mandating the inclusion of mine-safety records in SEC-registered firms' financial reports. While there have been several proposals for reform, important institutions in the U.S. mining sector like the MSHA successfully defended the law (Ruffennach, 2002). This paper examines the effectiveness of Section 1503. Mine safety records are already publicly available on MSHA's website, which allows for an isolated analysis of the required inclusion in the financial reports, regardless of the impact of the initial disclosure of the records. The law is considered effective if stakeholders such as NGOs respond to the MSD in the annual reports by placing a focus on the mines in question. As NGOs can exert significant influence on a company through information campaigns on mine safety issues, management may be motivated to improve safety measures (e.g., Nikkhah & Redzuan, 2010; Spar & La Mure, 2003; Sisaye, 2021; She, 2022; Ulleberg, 2009; Zohir, 2004). Thus, if NGOs consider the mandated MSD, it can have further implications on safety measures at reporting U.S. mines.

The results of this study show that the introduction of Section 1503 has no impact on the likelihood that a U.S. mine subject to this law will be targeted by NGOs. These findings suggest

that the law does not create additional incentives for SEC-registered mining companies to anticipate NGO campaigns by improving their security measures. Since the DiD Analysis conducted focuses only on the U.S. mining sector as well as NGOs' campaigning, general suggestions on the effectiveness of ESG mandates should be formulated with caution. Further research could explore different scenarios and use newly established databases such as the SIGWATCH database for quantitative analysis of stakeholders. In the context of the U.S. mining sector, this research suggests that Section 1503 of the Dodd-Frank Act may not have had the desired impact. This is based on the findings that NGO campaigning is not affected by the implementation of the Act for both the Treatment and Control Groups. On the one hand, these findings are in line with Danastas and Gadenne (2006) that find that NGOs do not use annual reports. On the other hand, the results are contrary to the previous work done by Christensen et al. (2017), which examine the real effects of Section 1503 on mine safety. The authors focused on the reaction of the capital market to the additional MSD and mainly made assumptions about the reaction of stakeholders. They find real effects of the Act but fail to provide an empirical analysis of stakeholder behavior. According to the conducted DiD Analysis in this paper, these real effects cannot be explained by an increased likelihood of NGO scrutiny.

A. Appendix

This appendix lists and defines the variables used in the Logistic Regression (1). The variables are based on those contained in the official MSHA Mine Record and in the SIGWATCH Database but have been modified for this study.

Variable	Definition
SEC	Dummy variable that equals 1 if the mine is owned by an SEC-registered company that has the same or similar name as the mine's legal entity listed on the MSHA website.
DFA	Dummy variable that equals 1 for the two-year period after Section 1503 of the Dodd-Frank Act was introduced on the 27th of January 2012.
COAL_METAL_IND	Dummy variable that equals 1 if a mine was identified as a metal/non-metal mine by MSHA and 0 if a mine was identified as a coal mine.
CURRENT_MINE_TYPE	Dummy variable that equals 1 if a mine was identified as a surface mine by MSHA and 0 if a mine was identified as an underground mine.
HOURS_PER_SHIFT	Number of hours per shift at the mine as entered on the Mine Information Form (MIF). May contain null values.
NO_EMPLOYEES	Number of workers employed at the mine as entered on the Mine Information Form (MIF). May contain null values.
Target	Dummy variable that equals 1 if a mine gets targeted by an NGO.

B. Appendix

Quintessentially, this paper builds on the assumption that the circumstances surrounding the implementation of Section 1503 of the Dodd-Frank Act allow for an isolated analysis of MSD. In an ideal world, all information added in the financial reports of SEC-registered mining companies is identical to the information disclosure on the MSHA website. Then SEC-registered mining companies' MSD is already available on MSHA's website, and the disclosure differs from an initial publication of the information. Thus, any impact on NGOs' campaigning can be attributed to the mandated MSD.

Unfortunately, the data structure on the MSHA website differs from MSD in financial reports (Christensen et al., 2017). While the MSHA disclosure is at the mine level and captures the legal entity of a mine, the MSD is included in the financial report of the parent company. In the case of 25% of the mines, the legal entity is a subsidiary, which differs substantially in name from the parent company registered with the SEC. While the names of subsidiaries are included in Exhibit 21 of 10K Filings, the MSD could still reveal a previously unknown connection between a mine and its SEC-registered parent company to a less informed party. NGOs ideally inform themselves fully before participating or starting a shaming campaign. They should

consequentially be aware of the link between a subsidiary listed as the legal entity of a mine and the parent company. However, the process of how an NGO gathers information is quite difficult to observe and could vary from organization to organization. Some research has been done, as for instance by Hatte and Koenig (2020) show that NGOs tend to target geographically close companies. Nevertheless, the possibility of an NGO being informed about a previously unknown mine ownership can lead to noise in the analysis. To ensure an isolated analysis of the prescribed MSD, this study only considers U.S. mines with legal entities that can be easily linked by name to the company registered with the SEC.

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