The Real Effects of Conflict Minerals Disclosures

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Abstract

Section 1502 of the Dodd–Frank Act requires Securities and Exchange Commission issuers to file conflict minerals disclosures (CMD) that indicate whether their product(s) contain tin, tungsten, tantalum, and gold that originate from the Democratic Republic of Congo and its nine neighboring countries (collectively referred to as "covered countries"). We examine the disclosures' real effects on firms' resourcing behavior and on regional conflict mitigation related to natural resources. Our analysis shows that CMDs compel companies to move toward responsible sourcing due to greater public attention, positive market reactions, and positive changes in socially responsible investor holdings, consistent with the reputational cost hypothesis. We also find that after the CMD rule takes effect, conflict incidence in the mining regions of the covered countries decreases relative to those of the non-covered countries. Overall, our evidence suggests that enhancing transparency regarding conflict mineral sourcing may help to alleviate a region's resource curse.

Keywords: Real effects, Dodd-Frank Act, Conflict minerals disclosures, Nonfinancial disclosure, Corporate social responsibility, Responsible sourcing, ESG, Due diligence, Supply chain, Resource curse

JEL Codes: C23; D22; D74; G14; G18; G38; K2; L2; M41; M48; O13; Q34

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1. Introduction

The extraction and distribution of Africa's natural resources have been a long-standing source of conflicts that bears economic, geopolitical, and humanitarian implications (U.N. Security Council, 2010). Many of the region's vast and valuable mineral reserves are set against a landscape of heightened political volatility and corruption, weak institutional structures and accountability, and poor social welfare. Scholars have coined a term for this paradox: the "resource curse" (Auty [1993], Sachs and Warner [1995], Auty [2001], Gylfason [2001]). The curse has been particularly pronounced in the Democratic Republic of Congo (DRC), where since 1996, over 6 million inhabitants have died as a result of conflicts related to its abundant natural resources (Chase [2010]).[1]

Concerned that the corporate purchase of conflict minerals (i.e., tantalum, tin, tungsten, and gold, also referred to as 3TG) was exacerbating the crisis, the U.S. Congress enacted Section 1502 as part of the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010 (hereafter referred to as the "Dodd-Frank Act" or "the Act"). This provision required Securities and Exchange Commission (SEC) issuers to file conflict minerals disclosures (CMDs) by May 31, 2014 and annually thereafter that indicate whether they believe their products contain conflict minerals that originate in the DRC or any of its nine neighboring countries, collectively referred to as the "covered countries."[2] The Enough Project, a nongovernmental organization (NGO) that played a leading role in advocating for Section 1502's passage, claims that 3TG minerals are the most lucrative source of revenue to armed groups in Central Africa; in 2008 alone, these groups

[1] See https://www.bsr.org/reports/BSR_Conflict_Minerals_and_the_DRC.pdf

[2] Covered countries include the DRC and nine "adjoining countries." The term "adjoining countries" is defined in the Dodd-Frank Act as countries that share an internationally recognized border with the DRC. When the SEC issued the CMD rule, these countries were Angola, Burundi, Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia. See Appendix II for a map of the covered countries.

earned an estimated $185 million from conflict minerals (Bafilemba et al. [2014]). By promoting supply chain transparency, the CMDs were intended to compel greater firm accountability and to curb the role of the conflict minerals trade in financing the region's armed groups. However, despite the importance of the SEC's regulation, there is limited empirical evidence on whether the CMD requirement has effectively stimulated responsible sourcing and reduced human rights abuses in the covered countries.[3] To fill this void in the literature, we investigate whether the CMD mandate successfully fulfills its goal of conflict mitigation.

It is ex ante unclear to what degree CMDs compel greater accountability in SEC issuers' sourcing practices. On the one hand, stakeholder activism and public pressure could incentivize companies to make a commitment to responsible sourcing (Bénabou and Tirole [2010], Kraft et al. [2020], She [2021]).[4] On the other hand, there are several reasons why CMDs may not be effective. First, companies may struggle to acquire and therefore provide detailed information about the sourcing of their 3TG minerals, especially if they operate multi-layered supply chains (Kim and Davis [2016]). Second, even if companies discover that their 3TG minerals are sourced from covered countries, they must then take numerous and often complex and costly steps to address the issue.[5] If the costs of altering suppliers outweigh the benefits of potential reputational gain for responsible sourcing, firms may continue to use conflict minerals that originate in the covered countries (Kalkanci, and Plambeck [2020]). Lastly, the SEC mandate does not impose a direct

[3] The present paper defines responsible sourcing as an approach to sourcing and supply chain management where an organization actively sources and procures both products and services in an ethical, sustainable, and socially conscious way. For a literature review, see Yawar and Seuring [2017].
[4] Hombach and Sellhorn [2018] define reputational costs as all reductions in firm value that result from a firm's exposure to public scrutiny. For example, companies incur reputational costs if they are perceived to fund armed groups, and thus conflicts, in the covered countries. Student-led campus initiatives have encouraged universities (e.g., the University of California, Berkeley) to publicly support the conflict-free movement by ceasing the purchase of cell phones, laptops, and other devices known to finance war in the DRC and neighboring countries.
[5] See Appendix III for OECD Due Diligence guidelines.

penalty for using conflict minerals.[6] Thus, companies may continue to source conflict minerals from the covered countries without legal repercussions, particularly given that the mandate does not constitute an embargo on the trade of conflict minerals from all covered countries. Considering these factors, it is an open empirical question whether Section 1502's CMD rule promotes sourcing transparency, let alone whether it reduces conflict in the covered countries.

Our study examines whether CMDs nudge companies to take real actions to source conflict-free minerals and, if so, whether those actions mitigate conflicts in the DRC and neighboring countries.[7] To establish whether CMDs lead companies to responsible sourcing, we hand-collect data on the number of conflict-free smelters and refiners disclosed in CMDs by all firms from 2014 to 2018. We supplement our proprietary hand-collected data with a dataset purchased from Developmental International, a not-for-profit organization that processed information in firms' CMDs issued between 2014 and 2016.

Using our hand-collected data, we find evidence that suggests a gradual increase in the percentage of conflict-free smelters after the CMD requirement. This is consistent with the extant literature finding that mandatory reporting standards induce improved information acquisition (e.g., Chenget al. [2018], Khan et al. [2019], Kang et al. [2021]). Increased public awareness of conflict minerals in firms' supply chains offers a likely explanation for the observed trend toward responsible sourcing. Therefore, we conduct two tests to examine whether reputational costs associated with a higher level of public awareness play a role in a company's decision to move toward responsible sourcing. First, our multivariate analysis using data from conflict minerals reports reveals that a shift toward responsible sourcing is more likely when a firm's CMDs garners

[6] However, issuers that make false or misleading CMDs are liable to any person who purchased or sold a security at a price that was affected by those disclosures.
[7] Conflict-free minerals are defined as minerals that do not directly or indirectly benefit armed groups in the covered countries.

greater public attention, measured by the number of downloads of CMDs. This evidence provides support that companies take real actions pursuant to public attention. Moreover, we find a 0.6% or 0.3% positive market reaction when firms disclose either a greater percentage of conflict-free smelters/refiners or a policy outlining dissociation plans from conflict minerals, respectively. These results provide evidence that the market values responsible sourcing. Second, we follow Christensen et al. [2017] and inspect whether socially responsible investors (SRIs) are sensitive to CMDs. Our results provide evidence that SRIs incorporate CMDs when they reconstitute their firm holdings, showing that investors with high sensitivity to humanitarian issues do care about conflict minerals issues.[8]

Next, we examine whether incidences of conflicts in covered countries' mining regions decline after the conflict minerals disclosure rule takes effect. Specifically, following Berman et al. [2017], we exploit a georeferenced panel dataset that divides the entire continent of Africa into about 10,000 subnational units (i.e., square cells 55 × 55 kilometers in area at the equator) and compare changes in conflict incidence around covered countries' mining areas relative to the contemporaneous changes in conflict incidence in the mining regions of non-covered countries. To obtain data on conflicts, we leverage information from the Armed Conflict Location & Event Database (ACLED), which includes dates, locations, and types of conflict events.[9]

To test our hypothesis, we employ a difference-in-differences (DiD) research design using a sample of 18,662 cell/year observations that includes 45 African countries from 2010 to 2019.

[8] For example, the Morningstar Minority Empowerment Index is constructed using a rules-based methodology to select firms with strong minority empowerment practices. One of the criteria for changing the constituent securities in the Index is firms' conflict minerals programs. For more detail, see https://indexes.morningstar.com/our-indexes/details/morningstar-minority-empowerment-FS0000DR2R?currency=USD&variant=NR&tab=sustainability.

[9] The use of ACLED is in line with a large body of economics and political science literature that examines conflicts in Africa at a PRIO-GRID-level (see Besley and Reynal-Querol [2014]; Berman and Coutteneir [2015]; Berman et al. [2017]; Harari and La Ferrara [2018]). ACLED is directed by Dr. Clionadh Raleigh (see Raleigh et al. [2010]), and its credibility is widely recognized.

We find that relative to non-covered countries' mining regions, conflicts in covered-countries' mining regions decrease by roughly 15% after the CMD mandate, indicating that human rights concerns in covered countries' mining regions were alleviated. This result is robust to the inclusion of cell and year fixed effects as well as a battery of controls related to local economic and labor conditions. In particular, the use of cell fixed effects in our model controls for time-invariant co-determinants of violence and mining at the local level, such as weak state capacity and property rights enforcement in remote places or underlying political instability (Berman et al. [2017]).[10] Our results are also robust to a variety of sensitivity checks, including parallel trends and placebo tests, ensuring the validity of the baseline results. Overall, our evidence suggests that Section 1502 achieves its intended humanitarian goal.

To confirm that Section 1502 effectively mitigates different types of conflicts, we stratify our sample into violent and non-violent conflicts. We document that real effects prevail across both types. Further, to alleviate the concern that the CMD rule motivates the migration of mining areas' armed groups to other regions, we examine whether conflict incidence spills over into non-mining areas and find that conflicts in the mining regions did not decrease at the expense of exacerbating violence elsewhere. Last, in a cross-sectional analysis, we test whether there are more significant decreases in conflicts in countries with weak political institutions. Prior research finds that institutional quality plays a critical role in determining how minerals affect a country's resource curse (Mehlum et al. [2006]). When countries experience resource booms, those with robust and accountable institutions tend to benefit more because these institutions function to control the misappropriation of resources (Robinson et al. [2006]). Consistent with Christensen, Maffett, et al. [2021], we provide evidence of a more pronounced reduction in conflicts in covered countries with

[10] For example, Berman et al. [2017] note that cell fixed effects can control for latent political instability related to ethnic cleavages.

weak political institutions, where the political resource curse is more likely to be prevalent. In sum, our paper is the first to provide compelling evidence that Section 1502's disclosure requirement motivates companies to dissociate themselves from sourcing conflict minerals that fund armed groups in covered countries, which in turn, results in conflict mitigation in the mining regions of covered countries. The effects of enhanced supply chain transparency appear to reverberate through transnational supply chains, thereby improving the humanitarian situation in the mining regions of covered countries.

We are aware of at least two prior studies on Section 1502's impact on the DRC's conflicts. Parker and Vadheim [2017] and Stoop et al. [2018] examine the legislation's effects using the post-period years of 2011–2012 and 2013–2015, respectively, and find that the regulation exacerbated the country's conflicts. These studies appear to expect companies to have acted immediately after the enactment of Section 1502 in 2010 or when the SEC passed the final rule in 2012, rather than after 2014, which is when firms are required to disclose whether their products contain 3TG that originate in the covered countries. Our study differs by using 2015 through 2019 as our post-period years and by focusing on the real effects after the CMD rule takes effect. Appendix IV provides anecdotal examples that validate that firms did not take any action until the disclosure requirement. These anecdotal examples were also confirmed in many private discussions with industry experts.[11]

Furthermore, isolating a credible counterfactual for the average treated mining region makes it difficult to identify the effects of Section 1502. For example, Parker and Vadheim [2017] and Stoop et al. [2018] compare changes in conflict incidence in the DRC's mining regions only to contemporaneous changes in the DRC's non-mining regions, which includes the nation's capital,

[11] Appendix V lists the names, roles, and experience of all the people we consulted during the writing of this paper.

Kinshasa. In comparison, we follow more recent studies and conduct PRIO-GRID analysis that allows us to focus on conflicts that are likely linked to mining activities while also expanding scope to cover all ten covered countries (e.g., Berman et al. [2017]; Harari and La Ferrara [2018]). Specifically, our DiD analysis compares changes in incidences of conflicts in the mining areas of the covered countries to the contemporaneous changes in incidences of conflicts in the mining areas of non-covered countries after the CMD regime becomes effective.

Our paper contributes to the extant literature in several ways. First, our study answers Christensen, Hail et al.'s [2021] call for more research on the consequences of Environmental, Social and Governance (ESG) reporting (Christensen et al. [2017], Ioannou and Serafeim [2017], Birkey et al. [2018], Grewal et al. [2019], Rauter [2020], Krueger [2021], She [2021]).[12] More broadly, we extend the literature on the real effects of disclosures (e.g., Leuz and Verrecchia [2000], Bens and Monahan [2008], Zhang [2009], Amir et al. [2010], Dyreng et al. [2016], Kanodia and Sapra [2016], Roychowdhury et al. [2019]) by examining whether CMDs compel companies to take real actions that have far-ranging effects on non-financial stakeholders (e.g., communities adversely affected by corporations' upstream operations). Through the CMD setting, we assess the impact of mandatory social responsibility disclosures on supply chains. Collectively, our research indicates that Section 1502's CMD requirement encourages companies to take real actions to source responsibly from their supply chains and to invest in initiatives that aim to improve the lives of people in the covered countries.[13]

Second, we add to the large body of economics and political science literature that

[12] The terms "environmental, social, and governance," "non-financial," and "corporate social responsibility" reporting are used interchangeably to describe reports that focus on environmental, social, or corporate governance issues to varying degrees.

[13] During the SEC's Reconsideration of Conflict Minerals Rule Implementation in 2017, the agency received public comment on whether to repeal the mandate. After carefully reviewing all 323 comments, we find that 270 supported the legislation. In Appendix VI, we provide an example of a comment letter issued in support of the Conflict Minerals rule.

examines the link between conflicts and natural resources (Berman et al. [2017], Besley and Reynal-Querol [2014]) and that inspects human rights abuses in cross-border supply chains (Heffernan [2016], Birkey et al. [2018]).[14] We show that conflict minerals disclosures help mitigate negative externalities of firms' upstream operations that affect a neglected stakeholder group—civilians who live near mining areas. In doing so, we extend an emerging body of literature that highlights the real effects of mandating social responsibility disclosures (Christensen et al. [2017], Rauter [2020], She [2021], Christensen, Maffett et al. [2021]).

Third, we inform regulators, corporations, and NGOs by speaking directly to the efficacy of Section 1502. The Government Accountability Office (GAO) is searching for performance indicators to assess progress toward the CMDs' overarching goal of addressing armed groups' exploitation of conflict minerals.[15] The European Union (EU) has also mandated ESG disclosures, including targeted Conflict Minerals Regulation that commenced as of January 2021.[16] While there may be limits to our findings' generalizability, our study provides the first set of evidence on the conflict-mitigating effects of the CMDs—a valuable insight given the aforementioned agenda and relevant initiatives.

Our paper proceeds as follows. In section 2, we discuss the institutional background. In section 3, we present the literature review and hypotheses development. Section 4 contains our empirical results. We summarize and conclude our study in section 5.

2. Institutional Background

2.1 Section 1502 of the Dodd-Frank Act

[14] One of the first widely publicized cases of human rights abuse in transnational supply chains occurred in the 1990s when the apparel and footwear sector was closely linked to sweatshops. Reports over substandard labor and human rights conditions related to well-known athletic apparel manufacturers were publicized by the media (e.g., CBS Evening News, 1996), prompting President Clinton to initiate the Apparel Industry Partnership in 1997, which introduced a workplace code of conduct and monitoring principles.

[15] See https://www.gao.gov/products/gao-20-595

[16] See https://ec.europa.eu/trade/policy/in-focus/conflict-minerals-regulation/regulation-explained/

In response to the 2007–2008 financial crisis, Congress enacted the Dodd-Frank Act in July 2010. Touted as the most comprehensive financial reform legislation since the 1930s, the Dodd-Frank Act aims to "promote the financial stability of the U.S. by improving accountability and transparency in the financial system, to end 'too big to fail,' to protect the American taxpayer by ending bailouts, to protect consumers from abusive financial services practices, and for other purposes." Yet, Sections 1502, 1503, and 1504 relate to furthering social objectives that are unrelated to the SEC's traditional mission of protecting investors and mitigating information friction.[17] In particular, Section 1502 addresses the role of conflict minerals in exacerbating the DRC's human rights crisis by stipulating, via the CMD rule, that SEC issuers design, in good faith, a reasonable inquiry to determine whether their 3TG minerals are sourced from covered countries.[18] To ensure compliance, the CMD rule specifies that SEC issuers must file specialized disclosures by May 31, 2014, and annually thereafter.[19] Firms that discover conflict minerals within their supply chain must *also* submit a conflict minerals report.[20]

Section 1502 exploits supply chain transparency as a mechanism to discourage the sourcing of conflict minerals. Weil et al. [2006] refer to such rules as "targeted transparency" regulations, which compel firms to disclose standardized information to reduce specific risks, ameliorate negative externalities, minimize the given social costs associated with a product, and/or improve provision of public goods and services. Overall, the CMD rule reflects Congress's choice to use a

[17] Section 1503 requires corporations to include information about mine-safety performance in their financial reports. Section 1504 requires firms to disclose information on payments to foreign governments for resource-extraction activities.

[18] It is worth noting that conflict minerals are defined in the U.S. legislation as tantalum, tin, tungsten, and gold, regardless of their extraction location. For example, even if a company's tin is extracted from Canada, because it is considered a conflict mineral, any company that uses it must disclose whether it is "DRC conflict-free" to meet the conflict minerals disclosure rule guidelines.

[19] We use the term conflict minerals disclosures to represent both specialized disclosures (i.e., Form SDs) and the exhibits within the SDs—conflict minerals reports.

[20] For an example of a conflict minerals report, see Appendix VII or https://www.apple.com/supplier-responsibility/pdf/Apple-Conflict-Minerals-Report.pdf

securities law disclosure requirement to achieve a specific humanitarian objective, representing a marked shift from the SEC's traditional role of investor protection to one of stakeholder protection (Lynn [2011]).[21]

2.2 The Resource Curse in the Democratic Republic of Congo

The resource curse refers to the paradox that countries with the largest endowment of natural resources often suffer from greater corruption, grievances, economic distress, and conflicts (Auty [1993], Sachs and Warner [1995], Auty [2001], Gylfason [2001]). Oil-rich Nigeria and the mineral-abundant Republic of Sierra Leone are cases in point. It is also well-documented that an abundance of natural resources attracts armed groups and potentially prolongs the reign of corrupt and incompetent governments through the extraction and sale of natural resources. Given its vast deposits of natural resources, the DRC is noted for suffering gravely from the resource curse (U.N. Security Council, [2010]). Specifically, a study by the United Nations Environment Programme in 2011 estimates that the DRC has an untapped deposit of minerals worth 24 trillion U.S. dollars (International Resource Panel, United Nations Environment Programme [2011]).

It is well-known that paramilitary groups in the DRC exploit the trade of natural resources to finance their operations, and that those revenues fuel further violence (SEC [2012], Prendergast and Bafilemba [2018]). In particular, armed groups in the DRC's eastern regions commit human rights abuses such as the use of child labor and sexual violence, which is motivated to drive a local population away from an artisanal mining area.[22] To this end, Collier et al. [2009] posit that armed

[21] A *New York Times* article states that "Representative Jim McDermott, a Democrat from Seattle, had tried for years to regulate conflict minerals. Mr. McDermott, who served as a Foreign Service medical officer in central Africa during the 1980s, [toured] a hospital that was treating people wounded in the continuing civil war. After visiting with a group of rape victims, he said he was shocked by the human rights abuses. Mr. McDermott traced much of the suffering to armed soldiers who sold tantalum and other minerals to finance their war." (*New York Times*, 2011) See: https://dealbook.nytimes.com/2011/07/13/unearthing-exotic-provisions-buried-in-dodd-frank/

[22] Artisanal mining refers to a manual mode of extraction conducted by individuals or communities. Artisanal mining occurs in approximately 80 countries worldwide; it is particularly widespread in developing countries in Africa, Asia, Central and South America, and Oceania (World Bank). The World Bank estimates that about 100 million people

groups assess operational costs to determine the financial feasibility of waging violence in a particular geographical location. Per the Enough Project's supposition that 3TG minerals are the most lucrative source of revenues for armed groups in Central Africa, a decrease in the demand for conflict minerals from covered countries may dampen the region's armed groups' revenues, compromising the viability of their continuing dominion over those areas.

3. Literature Review and Hypotheses Development

3.1 Literature Review

The extant literature investigates whether mandatory financial disclosures affect corporate decision-making (Leuz and Verrechia [2000], Healy and Palepu [2001], Beyer et al. [2010], Leuz and Wysocki [2016], Kanodia and Sapra [2016], Roychowdhury et al. [2019], Healy and Serafeim [2020]). For instance, Bens and Monahan [2008] show that after FIN 46 required the consolidation of variable interest entities in financial statements, corporations reduced investments in those entities. Zhang [2009] finds that, after SFAS 133 mandated that derivatives be recognized as either assets or liabilities at fair value, corporations decreased their speculative use of derivative instruments. Dambra et al. [2021] show that GASB 68's implementation, which altered disclosure requirements for government pension obligations, led counties to reduce public welfare expenditure, employment, and salary expenses.

There is also evidence that ESG disclosure regulations achieve their intended effects. For example, Christensen et al. [2017] show that when mine owners are obligated to disclose safety performance information in their 10-K filings due to Section 1503, they are incentivized to increase investments in that domain. Also, Rauter [2020] provides evidence that detailed disclosures about extraction payments to foreign host governments reduce illicit payment practices. Furthermore,

(workers and their families) depend on artisanal mining.

She [2021] finds that mandatory nonfinancial disclosures pertaining to firms' investigation of human rights abuses within their supply chains facilitate improved human rights performance on the part of their suppliers.

We extend the existing ESG disclosure studies in several ways. First, in our setting, every SEC issuer is required to identify the inclusion of conflict minerals in their supply chain. In contradistinction, mine safety performance disclosures are required only by mining companies (Christensen et al. [2017]), extraction payment disclosures are required only by natural resource extraction companies (Rauter [2020]), and Supply Chain Transparency Act disclosures only apply to large manufacturing and retail companies doing business in California (She [2021]). Therefore, Section 1502's CMDs are "probably the closest we have to a test of mandatory supply-chain disclosures for all U.S. SEC issuers."[23] Second, whereas in Christensen et al. (2017), the mining companies own their mines, SEC issuers have no ownership over the mines in covered countries that are usually several tiers away from the issuers in the supply chain. Therefore, it is an open empirical question whether companies' real actions (i.e., the move toward responsible sourcing) will fulfill the disclosure rule's objective to alleviate conflicts in covered countries. Finally, whereas mine safety performance disclosures (Christensen et al. [2017]) were publicly disclosed prior to Section 1503's enactment and are now provided via 10-Ks, CMDs were only publicly disclosed as of Section 1502's mandate and are filed with the SEC at the end of May, separately from other mandatory filings (e.g., 10-Ks). Additionally, CMDs provide granular information about companies' responsible sourcing efforts, thus bypassing the limitation of the California Statements mentioned in She [2021]. These two differences allow us to measure stock market reactions to CMDs not confounded by other news and to examine the real effects of public attention

[23] This quotation was taken from a discussion by Hans Christensen on Conflict Minerals Disclosures in Part 1 of the 2021 Journal of Accounting and Economics Conference at https://www.youtube.com/watch?v=NvyfL02IUT0

on companies' responsible sourcing actions.

3.2 Hypotheses Development

Section 1502 outlines the due diligence process required of all SEC issuers regarding their sourcing practices. As a first step, if 3TG are necessary to the functionality of the issuer's product, the issuer must conduct a "reasonable country of origin inquiry" into the source of the minerals. The issuer then has until the end of May of the following year to file a specialized disclosure form (i.e., Form SD) that reports whether the 3TG originated from the covered countries. If a company describes any of its products as "DRC conflict-free" in its CMD, it must obtain an independent private sector audit on its due diligence; if a company has products that are not described as "DRC conflict-free" in its CMD, then it must disclose the smelters or refiners used to produce the conflict minerals and the efforts made to determine the mine or location of origin.

We expect that conflict minerals disclosures will draw public attention and reputational costs that nudge managers toward responsible sourcing.[24] Extant studies provide ample evidence that public scrutiny and shareholder attention can play an important role in managerial discipline and corporate governance (Shleifer and Vishny [1986], Dyreng et al. [2016], Christensen et al. [2017], Rauter [2020], She [2021]). To this end, prior literature shows that opprobrium associated with socially *irresponsible* actions could result in greater cost of equity, stigma for employees, and fewer consumer sales (Cao et al. [2015], Novak and Bilinski [2018], Wang et al. [2018], Hartzmark and Sussman [2019], Rauter [2020]). To the extent that public attention and reputational costs affect corporate responsiveness, we anticipate that CMDs will motivate managers to strive for responsible sourcing. [25] Hence, our first hypothesis focuses on responsible sourcing (stated in the

[24] Hombach and Sellhorn [2018] define reputational cost as all reductions in firm value that result from a firm's exposure to public scrutiny.

[25] We have also considered the reasons for why the CMD rule, despite its intentions, may not achieve its desired aim. First, rather than imposing direct sanctions on specific countries, the U.S. Congress leveraged Section 1502 to *encourage* corporations to dissociate from conflict minerals. Hence, considering that the regulation's beneficiaries are

affirmative):

H1: *In response to the greater public attention associated with the conflict minerals disclosures requirement, firms will source responsibly from risky smelters and refiners that deal in conflict minerals originating in the covered countries.*

To the extent that the CMD regime successfully diminishes irresponsible sourcing of conflict minerals originating in the covered countries (i.e., the value of the spoils that go to the armed groups who control the mining regions), incentives for armed groups to commit acts of violence will also decrease. Given that the U.S. is the world's single largest economy, accounting for more than 20% of global output (www.ustr.gov), we predict that a widespread change in sourcing practices by SEC issuers could compromise armed groups' operations. That is, responsible sourcing by U.S. corporations will decrease rebel groups' incentives to resort to violence as the value of the contestable prize drops. Altogether, we expect managers to alter their sourcing behavior to align with society's expectations, thus reducing demand for conflict minerals that originate in the covered countries and disincentivizing the exertion of violence to control the mining areas.[26] We state our second hypothesis in the affirmative:

H2: *In response to the conflict minerals disclosure requirement, conflict incidence in the mining*

civilians in the covered countries who may lack financial claims over the firm, it is possible that the real effects may not materialize due to lack of substantive incentive to drive corporate behavioral sourcing changes. Second, the average firm may be unable to accurately conclude whether its products are "DRC conflict-free," since it can be challenging for a corporation that operates multi-layered supply chains to track the origins of its rawest inputs (Kim and Davis [2016], Islam and Van Staden [2018]). This difficulty can, for instance, encourage firms to elect to state that they were "unable to determine with certainty" whether the minerals do not originate in the covered countries *without* changing their sourcing behavior. If the costs of altering suppliers outweigh the benefits of attaining positive reputational standing, firms may continue to use conflict minerals that originate in the covered countries.

[26] For instance, firms can shift from using conflict minerals that originate in the covered countries to using recycled/scrapped 3TG.

regions of the covered countries is alleviated.

4. Responsible Sourcing and Its Impact on Conflicts in Covered Countries

To test our two hypotheses, we employ two datasets. In the first sub-section, exploiting hand-collected firm-level data, we examine the real effects of Dodd-Frank Act Section 1502 and observe whether firms shift to responsible sourcing due to CMDs. In the second sub-section, we use geopolitical data and investigate whether the CMD requirement alleviates the resource curse in the covered countries.

4.1. Responsible Sourcing

4.1.1 Data and Descriptive Statistics

To determine how the CMD requirement compels firms toward responsible sourcing, we begin by leveraging hand-collected data from the specialized disclosures and the exhibited conflict minerals reports.[27] As mentioned in Section 2.2, all SEC issuers are required to file a specialized disclosure. If a firm uses conflict minerals, it must also disclose a conflict minerals report that includes (i) a description of the products manufactured or contracted to be manufactured that are not ‘‘DRC conflict-free,’’ (ii) the facilities (e.g., smelters and refiners) used to process the conflict minerals, (iii) the country of origin of the conflict minerals, and (iv) the efforts made to identify the mine or location of origin. We utilize hand-collected data from items in the conflict minerals reports for the period of 2014–2018. Specifically, we gather information on the total number of smelters and the number of verified, conflict-free smelters/refiners for all firms for which the CMD rule applies during the sample period.

Further, we leverage data from Developmental International, a not-for-profit organization that collected qualitative data from CMDs between 2014 and 2016. For instance, when firm *i*

[27] See Appendix VII for examples of a specialized disclosure and conflict minerals report.

indicates that it has "implemented risk management plans, monitored and tracked performance of risk mitigations, and suspended or discontinued engagement with a supplier after failed attempts at risk mitigation or corrective action," Developmental International codes that firm *i* has "dissociation policies in place" related to conflict minerals. Our sample construction begins with all specialized disclosures submitted between 2014 and 2018. This sample consists of 4,082 firm-year observations for 1,035 unique firms. We then match this sample with price information from the *Center for Research in Security Prices* (*CRSP*) database and financial data from the *Compustat* annual file. After requiring non-missing information, our sample is limited to 1,956 firm-year observations for 776 unique firms.

To execute our empirical analysis, we employ two measures to proxy for *Responsible Sourcing*. Using our hand-collected data, our first measure, *% of Conflict-Free Smelters/Refiners*, is the ratio of the number of conflict-free smelters/refiners over the number of total smelters/refiners. Using the data from Development International, *Dissociation*, is an indicator variable equal to one if there is evidence that a firm suspends or plans to suspend its purchases from risky smelters and refiners, and equal to zero otherwise. To examine market reactions to the specialized disclosures, we use a standard event study methodology and calculate the cumulative market-adjusted return for each firm in our sample in the five-day window surrounding the annual specialized disclosure (*CAR*[-2, +2]). Given that the specialized disclosure is filed at the end of May, separately from other mandatory filings (e.g., annual reports), there are very few concurrent firm-specific news events. However, to mitigate the effect of observations that might be contaminated with other news, *CAR*[-2, +2] is winsorized at the 1% level.[28]

[28] Results remain qualitatively unchanged when we truncate or do not winsorize the sample.

Panel A of Table 1 reports the descriptive statistics for the variables of our constructed sample. The average *% of Conflict-Free Smelters/Refiners* is 71.6% in our sample. *Dissociation* statements can be found in 52.2% of the disclosures in our sample.[29] The average firm's market-adjusted abnormal returns around the disclosure event, *CAR*[-2, +2], is 0.3%. On average, a specialized disclosure is downloaded 85 times per year. The average firm has $9.293 billion in total assets, $11.157 billion in market value, and $6.730 billion in sales.

Panel B of Table 1 provides descriptive evidence of changes in *Responsible Sourcing* by year. The average *% of Conflict-Free Smelters/Refiners* monotonically increases from 44.6% in 2014 to 81.9% in 2018 and the cumulative level of firms that adopt or plan to adopt dissociation policies (i.e., *Dissociation*) increases from 45% to 64.5% between 2014 and 2016. These trends demonstrate that corporations are able to obtain and disclose information about the conflict minerals in their supply chains as they meet the due diligence requirements of CMDs.[30] Moreover, corporations' gradual dissociation from smelters and refiners that source minerals from the covered countries provides preliminary evidence supporting our first hypothesis.

(TABLE 1 ABOUT HERE)

4.1.2 Empirical Analysis of Responsible Sourcing

Increased public awareness of conflict minerals within a firm's supply chain may incentivize managers to shift toward more responsible sourcing practices. To determine whether public attention motivates them to do so, we estimate the following regression[31]:

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[29] For an example of a dissociation statement, Apple's 2017 Conflict Minerals Report (in Appendix VII) states: "*In 2017, Apple directed its suppliers to remove from its supply chain 10 smelters and refiners not willing to participate in, or complete, a Third Party Audit within given timelines.*"

[30] Shroff (2017) suggests that managers acquire new information because of disclosure requirements. Along the same lines, Roychowdhury et al. (2019) note that managers may only learn new information if a regulation forces them to collect it. Steinmeier and Stich (2019) posit that requiring corporations to produce sustainability reports can enhance the efficiency of managers' sustainability-related decisions.

[31] We run an ordinary least squares regression when the *Responsible Sourcing* variable is *% of Conflict-Free Smelters/Refiners* and a probit regression when the *Responsible Sourcing* variable is *Dissociation.*

$$Responsible\ Sourcing_{i,t} = \beta_1 Public\ Attention_{i,t-1} + \beta_{2-8} Controls_{i,t-1} + \eta_{ind} + \eta_{t-1} + \varepsilon_{i,t-1} \quad (1)$$

We use *Public Attention,* the total number of firm *i*'s specialized disclosures downloaded by non-robots from EDGAR during the previous calendar year, as a proxy for public scrutiny of companies.[32] We expect that companies with higher levels of *Public Attention* will be subject to greater reputational costs, following Dambra et al. [2021]. As for control variables, we follow Kim and Davis [2016] and construct several firm characteristic variables that could potentially confound the effects of public attention on *Responsible Sourcing*, such as profitability (e.g., *ROA*), the natural logarithm of revenues (e.g., *Sales*), and the natural logarithm of total assets (e.g., *Total Assets*). We account for growth by including the book-to-market ratio (*BTM*). We also control for the natural logarithm of cash (*Cash*) and free cash flow (*Free Cash Flow)* to account for firms' financial positions to alter their sourcing behavior. Lastly, we control for a firm's leverage ratio (*Leverage*). All variables are defined in Appendix I. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the impact of outliers. In all regression specifications where we test the real effects of CMDs related to firm sourcing, we include Fama-French 12 industry fixed effects to account for time-invariant unobserved heterogeneity at the industry level and year fixed effects to account for annual shocks.

Table 2 presents the results for estimating Equation (1). The coefficient on *Public Attention* indicates that companies are more likely to source responsibly, as proxied by *% of Conflict-Free Smelters/Refiners* and *Dissociation* by 1.2% and 4.5%, respectively, when there is greater public attention directed toward their conflict minerals reports. We multiply public attention by 100 to

[32] The EDGAR Server Log data, which contain information on internet search traffic for EDGAR filings through SEC.gov, are produced by the SEC's Division of Economic and Risk Analysis. For more information, visit *https://www.sec.gov/dera/data/edgar-log-file-data-set.html*. We follow Loughran and McDonald [2017] to obtain our data.

express the rate per 100 downloads/year. Thus, the economic interpretation is as follows: 100 downloads of a firm's specialized disclosure from EDGAR generates a 1.2% increase in *% of Conflict-Free Smelters/Refiners* and a 4.5% increase in the likelihood of *Dissociation.*[33] These results suggest that the shift toward responsible sourcing in year *t* is stronger for firms that receive more public attention in the prior year, consistent with the reputational cost hypothesis, which postulates that managers integrate social expectations into their sourcing decisions. Overall, our evidence suggests the CMD rule's efficacy as a transparency measure to nudge firms towards responsible sourcing.

(TABLE 2 ABOUT HERE)

To better understand sourcing motivations, in additional analyses, we examine whether disclosure of a firm's responsible sourcing results in positive or negative market reactions. Table 3 reports the results for our univariate analysis. Panel A of Table 3 reports the differences in the mean values of selected variables for firms that indicate that they suspend their purchases from risky smelters and refiners and those that do not. The results show that firms that dissociate (*Dissociation*=1) from risky smelters and refiners experience larger cumulative abnormal returns, are larger, and have lower book-to-market ratios than firms that do not dissociate (*Dissociation*=0). We use the entropy-balancing approach to mitigate concerns associated with the underlying differences between the two subsamples (Hainmueller and Xu [2013]). Results from Panel B show that there are no longer significant differences in the mean values of selected variables between firms with and without dissociation policies.

(TABLE 3 ABOUT HERE)

[33] The information on specialized disclosures can also be found on firms' websites or through other channels such as NGO reports. Therefore, note that the number of EDGAR log downloads of a firm's specialized disclosure from the prior year is a proxy of public attention to firms' conflict minerals due diligence.

4.1.3 Market Reactions to Responsible Sourcing

Next, we examine market reactions using the following regressions:

$$CAR[-2, +2]_{i,t} = \beta_0 + \beta_1 \, Responsible\ Sourcing_{i,t} + \beta_2 \, Size_{i,t} + \beta_3 \, BTM_{i,t} + \beta_4 Leverage_{i,t} + \varepsilon_{i,t.} \quad (2)$$

Following prior literature (Dhaliwal and Reynolds [1994], Warfield et al. [1995]), we control for the natural logarithm of market capitalization (*Size*), the book-to-market ratio (*BTM*), and the leverage ratio (*Leverage*) of firm *i*. Table 4 reports the regression results. Columns (1) and (2) show that the coefficient on *% of Conflict-Free Smelters/Refiners* is positive and statistically significant either without or with the inclusion of control variables. Columns (3) and (4) show that the coefficient on *Dissociation* is positive and statistically significant either without or with the inclusion of control variables. Specifically, we find that an increase in one standard deviation of *% of Conflict-Free Smelters/Refiners* (24.2%) leads to an increase of about 0.6% in market value.[34] Moreover, we observe an increase of about 0.3% in market value for firms that disclose dissociation policies over the five-day window. Given that the average firm's market value is $11.157 billion, an increase of 0.1% equates to $11.157 million. Overall, our results reflect the market's positive reaction to responsible sourcing and the enhanced value it associates with such commitments.

(TABLE 4 ABOUT HERE)

4.1.4 Socially Responsible Investors' Sensitivity to Conflict Minerals Disclosures

Next, we follow Christensen et al. [2017] and examine mutual fund reactions to CMDs. We focus on mutual funds because they are required to disclose their positions in equities, and, thus, are subject to public scrutiny (Stulz, [2007)). Furthermore, the number of funds that have

[34] The standardized regression coefficient estimate is generally calculated as follows: $B_1 \times \frac{Standard\ Error_{Responsible\ Sourcing}}{Standard\ Error_{CAR\,[-2,+2]}}$
For *% of Conflict-Free Smelters/Refiners*, the calculation is $0.007 \times \frac{0.242}{0.027} = 0.059$

made commitments to "socially responsible investing" (SRI) has grown significantly during the past decade. Many of these funds invest (or overweight relative to the market portfolio) in firms that are ethically sound based on environmental, social, or corporate governance criteria and meet standards such as U.N. global compact principles.[35] We use the Thomson Reuters Mutual Funds database to identify fund holdings of firms subject to the CMD requirement for the period from 2010, the year of Section 1502's enactment, to 2019. Following Hong and Kostovetsky [2012], we classify mutual funds' SRI status based on their inclusion in an index maintained by The Forum for Sustainable and Responsible Investment.[36] We assess mutual fund sensitivity to conflict mineral-related issues by examining each fund's percentage change in holdings from the end of the quarter prior to the disclosures of conflict minerals to the end of the current quarter by estimating the following OLS regression at the fund-firm-quarter level (suppressing fund, firm and year-quarter subscripts):

$$\begin{aligned} \%\Delta Holdings_{i,j,t} \\ &= \beta_0 + \beta_1 CM_{i,j,t} + \beta_2 CM \times CMD_{i,j,t} + \beta_3\, SRI \times CM_{i,j,t} \\ &+ \beta_4\, SRI \times CM \times CMD_{i,j,t} + \sum \beta_i\, Fixed\ Effects_{i,t} + \varepsilon_{i,j,t} \end{aligned} \tag{3}$$

%ΔHoldings is the percentage change in holdings for fund *i* in firm *j* from quarter$_{t-1}$ to quarter$_{t+1}$. *CM* is an indicator variable equal to one if a firm is subject to the CMD rule in a given quarter *t*.[37] *CMD* is an indicator coded as one after the CMD requirement (i.e., in the post-CMD

[35] The UN Global Compact provides a principles-based approach to doing business that meets fundamental responsibilities in the areas of human rights, labor, environment, and anti-corruption. See https://www.unglobalcompact.org/what-is-gc/mission/principles

[36] This index is available online at http://charts.ussif.org/mfpc/. We accessed this data in August 2021.

[37] Although the CMD mandate required all SEC issuers to file CMDs, we find that the number of SDs filed only represent approximately 15% of total active SEC issuers (measured by the sum of 10-K and 20-F filings) per year. For example, in 2014, there were 8,760 total active SEC issuers, yet only 1,334 of them filed SDs. Thus, we define SEC issuers who filed at least one CMD in their lifetime as CMs—firms subject to the CMD rule. Considering the percentage of firms that complied with the CMD rule, we believe that a reduction in information asymmetry leads SRI funds to respond positively to CMDs.

period). *SRI* is an indicator coded as one if a fund is identified as socially responsible. We include year-quarter fixed effects to control for any potential trends in ownership and allow these coefficients to vary across SRI and non-SRI investors. We also include mutual fund fixed effects to control for time-invariant differences in trading behavior and investment preferences across funds. We truncate the top and bottom 1% of *%ΔHoldings* to remove outliers and cluster standard errors at the fund level. In this specification, we distinguish the effect of CMD from changes in mutual funds' trading behavior around CMD's inception for CM quarters relative to non-CM quarters and for SRI relative to non-SRI funds.

We present the results of estimating Equation (3) in Table 5. Consistent with a lack of mutual-fund demand for firms with conflict minerals, the coefficient of 0.000 on *CM* indicates that, on average, prior to the disclosure requirement, mutual funds were insensitive to firms that would be subject to the conflict minerals rule. The coefficient of -0.019 on *CM* × *CMD* shows that mutual funds become sensitive to such firms when the disclosure requirement takes effect and decrease their ownership stakes by 1.9% on average, consistent with their decreased ownership allocations in firms that complied with the CMD rule. A potential explanation is that most mutual funds consider the CMDs to be immaterial and impose an additional burden on firms.

Looking at the incremental sensitivity of SRI funds to CMs, the coefficient on *SRI* × *CM* of −0.038 suggests that following Dodd-Frank's enactment, SRI funds respond more negatively to firms that would be subject to the CMD rule than other types of mutual funds. However, in the post-CMD period, the coefficient on *SRI* × *CM* × *CMD* of 0.039 indicates that SRI funds responded positively to the disclosures and increased their ownership stakes by 3.9% on average, consistent with their increased ownership allocations in firms that complied with the CMD rule. Overall, these findings indicate that SRI fund holdings react and attach positive value to CMDs at their time of filing.

(TABLE 5 ABOUT HERE)

4.2 Conflicts in Covered Countries

4.2.1 Data and Descriptive Statistics

In order to analyze how the disclosure rule impacts conflict incidence in covered countries' mining regions, we assemble a PRIO-GRID/year-level panel data set that includes 53 African countries represented by roughly 10,000 cells. Specifically, drawing upon Berman et al.'s [2017] design, we create a geo-referenced panel data set that divides the entire continent of Africa into 10,335 subnational units (i.e., square cells 55 × 55 kilometers in area at the equator) over the course of the period between 2010 and 2019. This data set covers virtually all of Africa's terrestrial regions, with a resolution of 0.5 × 0.5 longitude and latitude across 10 years. We supplement these data with Raw Material Data (RMD), which provides the locations of large-scale mining sites. Using these combined databases, we follow Berman et al. [2017] and Harari and La Ferrara [2018] and define *Mining Region* as an indicator variable equal to one if at least a single mine was recorded in any of the cells that surround the cell, and zero otherwise.[38]

Next, following the extant economics and political science literature examining conflicts in Africa (e.g., Berman et al. [2017], Harari and La Ferrara [2018]), we obtain data from the Armed Conflict Location and Event dataset (Raleigh et al. [2010]) on the dates, locations, and types of conflict events between 2010 and 2019.[39] Then, in accordance with prior research, we merge the

[38] Since the RMD dataset primarily contains data on large-scale mines, it is uncertain whether our data captures small-scale mines (e.g., armed groups' artisanal mines). While these measurement errors may introduce some attenuation bias into our estimates, we believe that our empirical strategy mitigates this concern. First, given the inclusion of cell fixed effects, measurement errors are unlikely to attenuate our estimates. Second, because our unit of analysis is a mining area (i.e., a 0.5 × 0.5 degree-cell), we interpret our mining region as a proxy for the extraction area of minerals rather than as coding for a specific RMD-referenced mine. If mines are spatially clustered, which has been confirmed in field discussions, then these mining areas encompass all mines, including large- and small-scale mines. Note that, consistent with prior literature, we also include the surrounding cells of the mining cells (Berman et al. [2017]).

[39] According to ACLED, its coding process "assures that it is accurate, comprehensive, transparent, and regularly updated. Data are posted as they are complete, although there are ongoing checks to ensure the thoroughness of previously collected events. ACLED data are coded by a range of experienced researchers who collect information primarily from secondary source information and apply the guidelines outlined in the codebook to extract information

ACLED data with the geo-referenced panel dataset after collapsing conflict information at the cell/year-level. This methodology allows us to test changes in conflict incidence at the cell/year-level and to account for a conflict's occurrence in a mining region. We remove cells that correspond to the four nations where conflicts were not reported in ACLED data during our sample period.[40] Finally, we gather information about country-level economic activities from TheGlobalEconomy.com, which contains over 300 indicators culled from multiple official sources, including the World Bank and the World Economic Forum.[41] Specifically, we collect the following control variables: (i) gross domestic product (GDP), (ii) GDP-per-capita, (iii) labor force, (iv) labor participation rate, (v) male unemployment rate, and (vi) capital investment.[42] We exclude observations with missing control variables, leading to the omission of four more nations. To mitigate the effect of outliers, we winsorize all continuous variables at the 1st and 99th percentiles. Lastly, we restrict our sample to mining regions, resulting in a final total of 18,662 cell/year observations that includes 45 African countries. Table 6 summarizes this process.

(TABLE 6 ABOUT HERE)

Panel A of Table 7 reports descriptive statistics for the variables of mining regions between 2010 and 2019. The average number of *Conflicts* in our sample is 0.92, indicating that an average cell (i.e., 55 km × 55 km) experiences slightly less than 1 conflict incidence a year. Furthermore, the average number of *Violent Conflicts* is 0.44, and the average number of *Non-Violent Conflicts*

from news reports. ACLED data are collected each week after individual researchers have scrutinized the information from reports; they are then aggregated and revised by the first coding reviewer, investigated and cross-checked by the second reviewer and then event notes and details are inspected by the third and final reviewer. The process is designed to assure: (1) Validity through intra- and inter-coder checks; (2) Accuracy to correct mistakes in coding; and (3) Relevance by determining whether each compiled event constitutes an act of political violence or protest."

[40] These four countries are Sao Tome and Principe, Rep. of Mauritius, Union of Comoros, and the Rep. of Cape Verde.

[41] See https://www.theglobaleconomy.com/download-data.php.

[42] The extant literature documents various factors aside from natural resources that contribute to the prevalence of conflicts in Africa (e.g., Ross [2004], Autesserre [2012], Geenen [2012], Seay [2012], Radley and Vogel [2015]. Vogel and Raeymaekers [2016]). These elements include: (i) weak and poorly functioning political institutions, (ii) ethnic fragmentation and polarization, and (iii) endemic poverty. We attempt to control for these constructs by using cell fixed effects.

is 0.31. For the nations represented in our sample, the median *GDP* and *GDP-per-capita* are $29.31 billion and $1,743.65, respectively. The median country has 10.94-million *Labor Force*, $8.27-billion *Capital Investment*, *Labor Participation Rate* of 62.73%, and a *Male Unemployment Rate* of 8.11%. Panel B of Table 7 presents pairwise Pearson and Spearman correlations between *Ln Conflicts* and the aforementioned country characteristics. *Ln Conflicts* is negatively correlated with *GDP-per-capita* and positively correlated with *GDP*, *Labor Force*, and *Capital Investment*.

(TABLE 7 ABOUT HERE)

4.2.2 Empirical Analysis of Impact in Covered Countries

Our objective in this sub-section is to determine whether Section 1502 of the Dodd-Frank Act successfully reduced conflict in the DRC and its adjoining countries. To compare the changes in conflict incidence in the mining regions of covered countries to contemporaneous changes in the mining regions of non-covered countries after the CMD regime took effect, we estimate the following regression:

$$Ln\ Conflicts_{k,t} = \beta_1 Post\ CMD \times Covered\ Country_{k,t} + \beta_{2-7} Controls_{c,t} + \eta_c + \eta_t + \varepsilon_{k,t}, \quad (4)$$

where *Ln Conflicts* is the natural logarithm of (1 + the number of conflicts) in a cell *k* during year *t*. *Post CMD* is an indicator variable equal to one for years after 2014, and equal to zero otherwise.[43] *Covered Country* is an indicator variable equal to one if country *c* is designated as a covered country under Section 1502, and equal to zero otherwise. Our main coefficient of interest on *Post CMD* × *Covered Country* estimates the change in the level of conflict incidence in covered countries' mining regions relative to the contemporaneous changes in non-covered countries'

[43] While the specialized disclosure first became public at the end of May 2014, we set our post indicator variable to begin in 2015. This is because, consistent with prior literature on conflict minerals disclosures, we find that firms need time to acquire supply chain information. A 2019 report by the U.S. Government Accountability Office substantiates this claim. The report indicates that the percentage of companies that could determine the origins of their inputs rose from just 30% in 2014 to about 50% in 2015 (GAO-19-607).

mining regions.[44] We include cell fixed effects (i.e., η_k) to account for time-invariant unobserved heterogeneity at the cell level. To this end, our identification strategy exploits within-cell variations in conflicts and controls for time-invariant unobservables at the cell-level.[45] We also include year fixed effects (i.e., η_t). Furthermore, we control for various theoretical determinants of conflicts, such as national wealth and male unemployment rate. For instance, we follow prior literature and control for *GDP-per-capita* at the country level (Besley and Reynal-Querol [2014]). We also control for social influences on crime, such as *Labor Force* and *Labor Participation Rate*. In addition, we control for *Capital Investment*, since both public and private investments can offset social issues related to unemployment. Lastly, we cluster standard errors by country, given that our treatment effect is at the country level (see Bertrand et al. [2004]). Appendix I presents the detailed variable definitions.

Columns (1) and (2) of Table 8 present the results of estimating Equation (4) before and after controlling for country characteristics and cell and year fixed effects, respectively. Over our time series, we observe a 17.7% ($e^{0.163} - 1$) increase in conflicts, as evidenced by a positive and statistically significant coefficient on *Post*. Moving on to relative effects, we focus on the interaction term *Post* × *Covered Country*, which captures the CMD regime's incremental effect. Column (1) shows that the number of conflicts declined for covered countries relative to uncovered countries following the CMD rule (coeff. = -0.098, p-value < 0.01). This coefficient suggests a

[44] While Section 1502 distinguishes between 3TG and non-3TG minerals, it is difficult to isolate how the mandate affected these two groups within our sample. This is because a large number of non-3TG mines are clustered within 3TG mining regions and, as a result, our PRIO-GRID analysis captures many non-3TG mines as 3TG mines.

[45] Leuz (2018) states that "regulation does not occur in a vacuum," and we acknowledge that our empirical analysis is susceptible to other institutional changes. For example, there is the potential concern that the conflict reporting in ACLED data is biased toward certain countries due to differences in media coverage. But our empirical methodology renders it unlikely that this characteristic affects our results, as structural differences in media coverage are captured by cell fixed effects. In addition, we show that our results are obtained across both violent and non-violent conflicts. Moreover, our private discussions with industry experts confirm that while other initiatives have alleviated conflicts in the covered countries, Section 1502 has been the single largest driver of conflict mitigation.

9.3% ($e^{-0.098} - 1$) decline in conflict incidence in the covered countries' mining regions relative to those of the non-covered countries. We find a decline of 15.1% ($e^{-0.164} - 1$) in Column (2) after including several control variables, as well as year and cell fixed effects. Adding the *Post* and *Post* × *Covered Country* coefficients in tandem reveals that although conflicts increase significantly in non-covered countries' mining regions, their escalation is lower in the covered countries, suggesting that the CMD rule does help to mitigate conflict escalation.

Next, we examine whether the CMD rule effectively suppressed both violent and non-violent conflicts. As reflected in Section 1502, the legislation was intended to promote the humanitarian goal of alleviating conflict in the DRC, which has been partially financed by the exploitation and trade of conflict minerals that originating there. To assess the rule's achievement of these broader aims, we rely on the ACLED distinction between violent and non-violent conflicts to examine whether both types are mitigated following the CMD rule.[46] We test for this by replacing the outcome variable in Equation (4) with the natural log of violent and non-violent conflicts, respectively, for Equation (5):

$$Ln\ (Non)Violent\ Conflicts_{k,t} = \beta_1 Post\ CMD \times Covered\ Country_{k,t} + \beta_{2-7} Controls_{c,t} + \eta_k + \eta_t + \varepsilon_{k,t} \quad (5)$$

Columns (3) and (4) of Table 8 present the results of estimating Equation (5) for violent conflicts, while Columns (5) and (6) present the results for non-violent conflicts. The coefficients of interest in Columns (4) and (6) suggest a 9.70% ($e^{-0.102} - 1$) decline in the incidence of violent conflicts in the post-disclosure period and an 8.42% ($e^{-0.088} - 1$) decline in the incidence of non-violent conflicts. Overall, our results show that the CMD rule effectively mitigates both types of conflicts.

[46] Violent and non-violent conflicts are defined in Appendix I. Examples of conflicts are presented in Appendix VIII.

(TABLE 8 ABOUT HERE)

4.2.3 Spillover Test

To alleviate concern that the CMD rule motivated armed groups to migrate from mining areas into other regions, we perform an additional test to examine whether conflicts in the mining regions spilled over to surrounding areas.[47] We test for this by re-estimating Equations (4) and (5) using the non-mining region sample. Our results, reported in Table 9, indicate that conflicts in the covered countries' mining regions did not spread to other regions. Specifically, the coefficients on *Post* × *Covered Country* are statistically insignificant across our dependent variables when we compare conflict incidence changes in the non-mining regions of the covered countries with the contemporaneous changes in non-mining regions of the non-covered countries.

(TABLE 9 ABOUT HERE)

4.2.4 The Role of Political Institutions

Prior research finds that institutional quality plays a critical role in determining how mineral wealth affects a country's resource curse (Mehlum et al. [2006]). Robust and accountable institutions serve to control the misappropriation of resources in the event of a country's resource boom (Robinson et al. [2006]). Therefore, after the CMD rule, we expect to observe more significant decreases in conflict incidence in countries with weak political institutions, where the resource curse is likely to be most prevalent.

To test this prediction, we follow Christensen, Maffett et al. [2021] and divide the covered countries based on the strength of their political institutions. Specifically, we classify countries' political institutions as strong or weak based on the Center for Systemic Peace's Polity IV Democracy Index from 2010 to 2019. The Polity IV index ranks countries' political institutions on

[47] Our discussions with field experts confirmed that armed groups did not migrate from mining regions of covered countries to those in non-covered countries.

a scale of -10 (autocracy) to 10 (full democracy). If a country's Polity IV score is less than 6, which represents the threshold for a democracy, it is considered a weak political institution. To test the differential effects of the CMD rule on covered countries with strong political institutions and weak political institutions, we include all controls but allow the coefficients on *Post* × *Covered Country* to differ between covered countries with strong-political institutions and weak-political-institutions and estimate Equation (6):

$$\begin{aligned} Ln\,(Non)[Violent]\,Conflicts_{k,t} \\ &= \beta_1 Covered\ Country_{Strong_{k,t}} \\ &+ \beta_2 Post\ CMD \times Covered\ Country_{Strong_{k,t}} \\ &+ \beta_3 Covered\ Country_{Weak_{k,t}} \\ &+ \beta_4 Post\ CMD \times Covered\ Country_{Weak_{k,t}} \\ &+ \beta_{5-10} Controls_{c,t} + \eta_k + \eta_t + \varepsilon_{k,t} \end{aligned} \tag{6}$$

Table 10 presents the results of this analysis using non-covered countries as the control group. Specifically, consistent with Christensen, Maffett et al. (2021), we find that the post-CMD observed decrease in conflicts is significantly larger in covered countries with weak political institutions as compared with those with strong institutions. The coefficient of interest in $Post\ CMD \times Covered\ Country_{Strong}$ and in $Post\ CMD \times Covered\ Country_{Weak}$ shown in Column (1) suggests a statistically significant 6.76% ($e^{-0.070} - 1$) decline in conflict incidence in strong-political-institutions countries and a statistically significant 12.98% ($e^{-0.139} - 1$) decline in weak-political-institutions countries relative to the control group, respectively. In Column (2), we find a statistically insignificant decline in violent conflict incidence in strong-political-institutions countries but a statistically significant decline in violent conflict incidence in weak-political-institutions countries. In Column (3), we find qualitatively similar results as Column (1)

for nonviolent conflicts. The difference in the *Post* × *Covered Country* for covered countries with strong and weak political institutions is statistically significant, as reflected by the p-value of (0.01) 0.02 for (violent) conflicts. However, the difference is statistically insignificant for non-violent conflicts, as reflected by the p-value of 0.23. These results are consistent with the CMD requirement's positive impact on alleviating the resource curse, as the reduction in conflicts is most pronounced in covered countries with weak political institutions.

(TABLE 10 ABOUT HERE)

4.2.5 Parallel Trends and Robustness

We recognize that our DiD research design relies on the parallel trends assumption (Bertrand et al. [2004], Gow et al. [2016], Cuny et al. [2021]). To test for the assumption that conflicts in the mining regions of covered and non-covered countries would have followed parallel trends in the rule's absence, in Panels A through C of Figure 1, we plot the log-adjusted conflicts for each of the three groups in our analyses (all conflicts, violent conflicts, and non-violent conflicts) between the years 2010 and 2019.[48] All three panels show that both the treatment group of covered countries and the control group of non-covered countries follow parallel trends in the pre-CMD period. These groups begin to diverge in 2015, when there is a decrease in the number of conflicts in covered countries and an increase in the number of conflicts in non-covered countries. There are two possible reasons for increased conflict incidence in 2016: election-related political unrest (e.g., President Joseph Kabila's refusal to step down at the official end of his mandate) and other instabilities related to ethnic conflicts and disputes with the central

[48] Consistent with standard DiD approaches (i.e., Angrist and Pischke [2009]), our identifying assumption is that in the absence of treatment, the difference in levels (and not the percentage changes) would remain the same across groups.

government.[49] After 2016, the number of conflicts increases at a slower pace in covered countries (and is stagnant for violent conflicts) relative to non-covered countries.

Overall, Figure 1 supports the parallel trends assumption and provides preliminary evidence that the CMD requirement contributes to a reduction in conflicts in covered countries' mining regions relative to those in non-covered countries. Furthermore, this comparative decrease appears to be driven by the maintenance of conflict levels in the mining regions of covered countries (except for violent conflicts in 2016), while the number of conflicts continues to increase in the mining regions of non-covered countries.

(FIGURE 1 ABOUT HERE)

We employ three additional tests to support the parallel trends assumption. First, we follow Angrist and Pischke [2009] and Lechner [2011] and test the parallel trends assumption by using pre-treatment time period indicator variables. To do so, we replace the *Post* × *Covered Country* indicator in Equations (4) and (5) with separate interactions for each of the years in our sample (except for 2014, which serves as the benchmark). The results of this analysis are reported in Table 11. In Figure 2, we graph the *Year* × *Covered Country* coefficient estimates and their corresponding 95% confidence intervals. In support of the parallel trends assumption, the estimated treatment effects in the pre-treatment period are close to zero and statistically indistinguishable from the benchmark period. Consistent with the notion that the CMD regime suppresses conflicts in covered countries, during the post-period, treated cells exhibit a gradually decreasing level of conflicts relative to control cells. The gradual decrease in the coefficient estimate is consistent with the supposition that armed groups are unlikely to abruptly halt their activities.

[49] See https://acleddata.com/2016/12/09/democratic-republic-of-congo-december-2016-update/

(TABLE 11 ABOUT HERE)

(FIGURE 2 ABOUT HERE)

In our second analysis, we follow Serfling [2016] and add linear time trends specific to covered and non-covered countries to Equations (4) and (5), respectively. These group-specific time trends control for the possibility that the number of conflicts (violent and non-violent) in covered countries and the number of those in non-covered countries trend differently throughout the sample period due to coincidence with the CMD regime. As shown in Table 12, our results are statistically and economically similar after controlling for these trends, which suggests that there is no pre-treatment trend.

(TABLE 12 ABOUT HERE)

Third, we follow prior studies and perform a placebo test (Amore and Bennedsen [2013], Derrien and Kecskes [2013], Gilje and Taillard [2016], Almeida et al. [2017]) to examine the validity of our choice of after 2014 as our post period. Specifically, we re-estimate Equations (4) and (5) but re-define our *Post* indicator as equal to one for years after 2011, instead of 2014, while focusing on the sample period between 2010 and 2014 (i.e., pre-Section 1502). The lack of statistical significance across all columns reported in Table 13 confirms that the trends were similar prior to 2014 and, thus, that the parallel trends assumption is justified.

(TABLE 13 ABOUT HERE)

5. Conclusion

When the SEC passed Section 1502 of the Dodd-Frank Act, it included the provision to require firms to exercise due diligence regarding the source and chain of custody of materials known for fueling conflicts. Despite the importance of the CMD rule and the debate about its

consequences, the literature is largely silent on whether the CMD mandate has effectively reduced conflicts. As such, we examine the following two questions: (1) Does enhanced supply chain transparency motivate corporations to dissociate from smelters or refiners that deal in conflict minerals irresponsibly sourced from the covered countries? (2) Does conflict incidence in the mining regions of the covered countries decrease after the CMD requirement takes effect?

We find that following the CMD requirement, firms gradually shift toward more responsible sourcing and that the market reacts positively to these actions. Using PRIO-GRID/year panel data for the period from 2010 to 2019, we show that Section 1502 effectively decreased conflicts after 2014. Further, we document that conflicts in the mining regions did not spread to other regions. Collectively, we provide evidence that enhanced transparency in the U.S., promotes responsible sourcing behavior, and, in so doing, reduces conflicts in the DRC and its neighboring countries.

Caveats are in order. Conflict minerals are not the only drivers of conflict within our study's purview. Specifically, the extant literature proposes three additional factors that might prolong conflicts in Africa: weak and poorly functioning political institutions, ethnic fragmentation and polarization, and endemic poverty (see Ross [2004]). While we have closely followed prior literature (e.g., cell-fixed effects, controlling for GDP, male unemployment rate, etc.), it is difficult to accurately control for all of the determinants of civil conflict. Additionally, we do not claim to have documented the complete cessation of conflicts. While our empirical evidence suggests that the CMD regime reduced conflicts and improved the quality of life in the covered countries, the United Nations continues to report serious human rights violations as of 2019. In addition, according to a 2019 report by the GAO, members of the Congolese national military and police still derive illegal revenues from smuggling and the illicit taxation of minerals from eastern Congolese mines. Despite these ongoing challenges, our paper provides initial evidence on the

potentially transformative role that disclosures play in altering firms' sourcing behavior and mitigating conflicts in the covered countries.

APPENDIX I
Variable Definitions

Variable	Definition
Responsible Sourcing Variables:	
% Conflict-Free Smelters/Refiners	The ratio of the number of conflict-free smelters and refiners over the number of total smelters and refiners.
Dissociation	An indicator variable equal to one if there is evidence that a firm suspends its purchases from risky smelters and refiners, and equal to zero, otherwise.
Public Attention	The number of EDGAR downloads of specialized disclosures from the previous year.
CAR	The average firm's market-adjusted abnormal returns cumulated over a five-day window around the specialized disclosure.
Size	The natural logarithm of (Market Capitalization)
BTM	Book Value of Equity / Market Value of Equity
Free Cash Flow	(Net Cash Flow from Operating Activities – Dividends) / Total Assets
ROA	Earnings Before Income Tax, Depreciation, and Amortization / Total Assets
Leverage	(Long-Term Debt + Current Liabilities) / Total Assets
Cash	The natural logarithm of (1 + Cash)
Sales	The natural logarithm of (Total Annual Sales)
Total Assets	The natural logarithm of (Total Assets)
% Change in Holdings	The percentage change in holdings for fund *i* in firm *j* from quarter$_{t-1}$ to quarter$_{t..}$
CM	An indicator variable equal to one if a firm is subject to the conflict minerals disclosure rule, and equal to zero, otherwise.

CMD	An indicator variable equal to one starting from the year 2015, and zero otherwise (i.e., between 2015 and 2019 in our main specification).
SRI	An indicator variable equal to one if a mutual fund is classified as SRI based on inclusion in an index maintained by *The Forum for Sustainable and Responsible Investment* (*USSIF*).

Mining Region Variables

Ln Conflicts	The natural logarithm of (one plus the number of conflicts) in cell *k* of year *t*.
Ln Violent	The natural logarithm of (one plus the number of violent conflicts) in cell *k* of year *t*. The ACLED's definition of violent conflicts as battles (interactions between two organized armed groups), explosions (one-sided events in which the tactic creates asymmetry by disabling target response), violence against civilians (events where an organized armed group deliberately inflicts violence upon unarmed non-combatants), and riots (events where demonstrators or mobs engage in disruptive acts or disorganized acts of violence against property or people).
Ln Nonviolent	The natural logarithm of (one plus the number of non-violent conflicts) in cell *k* of year *t*. The ACLED defines non-violent conflicts as protests (a public demonstration against a political entity, government institution, policy, or group in which the participants are not violent) and strategic developments (events that may contribute to a state's political disorder and/or may trigger future events).
Post CMD	An indicator variable equal to one after the year 2014 and zero otherwise (i.e., between 2015 and 2019 in our main specification).
Mining Region	An indicator variable equal to one if at least one mine was recorded in any of the cells that surround cell *k* and zero otherwise, following the specification of Berman et al. (2017).
Covered Country	Defined by Section 1502 of the Dodd-Frank Act as the DRC and nine other "adjoining countries": Angola, Burundi, Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia.

$Covered\ Country_{Strong}$	An indicator variable equal to one if a covered country's Polity IV score is 6 or higher, the threshold for a democracy, in a given year and zero otherwise. The Polity IV score is based on the Center for Systemic Peace's Polity IV Democracy Index from 2010 to 2019.
$Covered\ Country_{Weak}$	An indicator variable equal to one if a covered country's Polity IV score is lower than 6, the threshold for a democracy, in a given year and zero otherwise. The Polity IV score is based on the Center for Systemic Peace's Polity IV Democracy Index from 2010 to 2019.
GDP	The sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in current U.S. dollars.
GDP-per-capita	Gross domestic product divided by mid-year population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in current U.S. dollars.
Labor Force	The segment of the population that is 15 years or older and able to work.
Labor Participation Rate	The proportion of the population age 15 and older that is economically active: all people who supply labor for the production of goods and services during a specified period.
Male Unemployment Rate	The share of the male labor force that is without work but available for and seeking employment.
Capital Investment	Outlays on additions to the economy's fixed assets plus net changes in inventory levels. Data are in current U.S. dollars.

APPENDIX II
Covered Countries and Non-Covered Countries of Africa

Appendix II shows the Democratic Republic of Congo and its nine adjoining countries—collectively referred to as "covered countries" under Section 1502 of the Dodd-Frank Act—in dark grey and all non-covered countries in light grey.

APPENDIX III
OECD Due Diligence Guidance for Responsible Mineral Supply Chains from Conflict-Affected and High-Risk Areas

STEP 1: Establish strong company management systems

A) Adopt, and clearly communicate to suppliers and the public, a company policy for the supply chain of minerals originating from conflict-affected and high-risk areas. This policy should incorporate the standards against which due diligence is to be conducted.

B) Structure internal management to support supply chain due diligence.

C) Establish a system of controls and transparency over the mineral supply chain. This includes a chain of custody or a traceability system or the identification of upstream actors in the supply chain. This may be implemented through participation in industry-driven programs.

D) Strengthen company engagement with suppliers. A supply chain policy should be incorporated into contracts and/or agreements with suppliers. Where possible, assist suppliers in building capacities with a view to improving due diligence performance.

E) Establish a company-level, or industry-wide, grievance mechanism as an early-warning risk-awareness system.

STEP 2: Identify and assess risks in the supply chain

A) Identify risks in the supply chain.

B) Assess risks of adverse impacts in light of the standards of the supply chain.

STEP 3: Design and implement a strategy to respond to identified risks

A) Report findings of the supply chain risk assessment to the designated senior management of the company.

B) Devise and adopt a risk management plan. Devise a strategy for risk management by either i) continuing trade throughout the course of measurable risk mitigation efforts; ii) temporarily suspending trade while pursuing ongoing measurable risk mitigation; or iii) disengaging with a supplier after failed attempts at mitigation or where a company deems risk mitigation not feasible or unacceptable. Consider the ability to influence, and where necessary take steps to build leverage, over suppliers who can most effectively prevent or mitigate the identified risk. If companies pursue risk mitigation efforts while continuing trade or temporarily suspending trade, they should consult with suppliers and affected stakeholders, including local and central government authorities, international or civil society organizations and affected third parties, where appropriate, and agree on the strategy for measurable risk mitigation in the risk management plan. Companies may draw on suggested measures and indicators to design conflict and high-risk sensitive strategies for mitigation in the risk management plan and measure progressive improvement.

C) Implement the risk management plan, monitor and track performance of risk mitigation efforts and report back to designated senior management. This may be done in cooperation and/or consultation with local and central government authorities, upstream companies, international or civil society organizations and affected third-parties where the risk management plan is implemented and monitored in conflict-affected and high-risk areas.

D) Undertake additional fact and risk assessments for risks requiring mitigation, or after a change of circumstances.

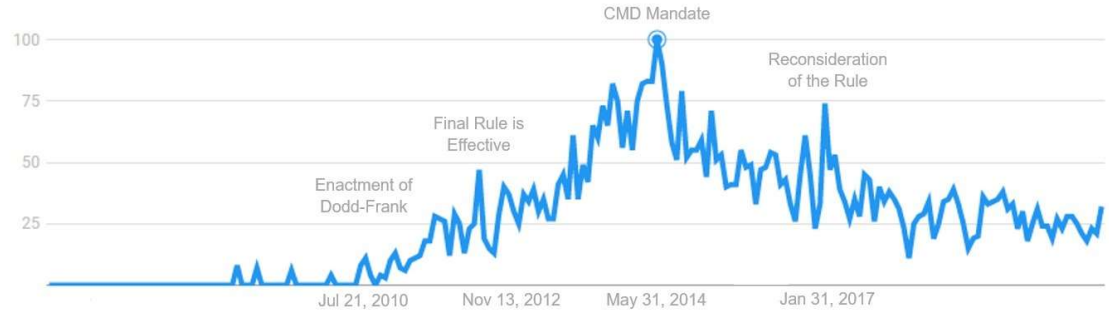
STEP 4: Carry out independent third-party audit of smelter/refiner's due diligence practices

STEP 5: Report annually on supply chain due diligence

Source: OECD iLibrary | OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Third Edition (oecd-ilibrary.org)

APPENDIX IV
Selection of 2015 as Boundary Year for Treatment Observation

Figure V.1: Google Searches for Conflict Minerals between January 2004 and December 2021



Notes: This figure shows the natural logarithm of Google search activity related to "conflict minerals" from 2004 to 2021. *Relative Google Search* is an index that captures the frequency of Google searches that include the term "conflict minerals" measured relative to all other Google searches over the same period. We obtain data on Google searches from Google Trends.

Figure V.1 plots the trend of Google searches for the term "conflict minerals" between 2004 and 2021. The first increase in search frequency occurs in December 2010, which is when Dodd-Frank was enacted. This trend is higher in 2012, when the final rule was approved by the SEC, and reaches its peak in May 2014, when companies were first required to provide conflict mineral disclosures. The trend dissipates after 2014 but is still relatively high compared to the pre-Dodd Frank Act period. Overall, this figure provides evidence that it took several years after the Dodd-Frank was enacted to achieve high levels of public awareness. This is consistent with Bond et al. [2012], who claim that for real effects to occur, firms must first file their disclosures and receive feedback from the market. Managers extract the information from market pricing and use it to guide their firm's decisions. As such, it is evident that most companies rely upon market feedback and subsequently more investments to spur due diligence of their supply chains and that this process defines the timeline for observation of the CMD mandate's real effects. Therefore, we chose 2015 as the onset of the treatment period (i.e., when the real effects of conflict minerals disclosures are most likely to begin materializing).

The examples below show that most firms implemented decisions around conflict minerals after the CMD mandate took effect in 2014. We include these examples to contextualize our choice of 2015 as the first year expected to evidence the real effects of Section 1502. Overall, the following examples suggest that firms did not move substantively toward eradicating conflict minerals in their supply chains until after 2014. This lag may not be surprising, given that the SEC has estimated the cost of compliance at $3 billion to $4 billion, and the rule's critics have deemed it as high as $16 billion during the first year of implementation alone (SEC [2012]). This line of evidence suggests that the transition to responsible sourcing may be either slow to materialize or elusive. In addition to the examples, our discussions with field experts indicate that it took companies significant time to map their supply chain and fully understand whether, and to what extent, they source conflict minerals.

Example 1: Dr. Denis Mukwege, Nobel Prize winner for his efforts to fight conflict minerals, contributes his opinion on Tracing the Source of 'Conflict Minerals' in the *New York Times* (April 2015)

"The United States took a positive step in 2010, introducing legislation to compel listed companies that use tantalum, tin, gold or tungsten in their production or products to investigate their supply chains. The regulations, which were adopted in 2012, require these companies to submit annual findings to the Securities and Exchange Commission, starting in 2014, and publish their reports online.

Some corporations have made commendable efforts, sending teams to visit the mines and smelters where their minerals are extracted and processed, and acting on the results. Since 2010, Apple has endeavored to map its supply chain and has reported an increase in the number of conflict-free smelters it uses. Electronics companies like Intel and Hewlett Packard, facing growing consumer pressure, have also taken steps to identify the sources of their minerals. Last year, Intel announced that all of its microprocessors would be produced using conflict-free minerals. But others have done the opposite, hiding behind industry groups like the National Association of Manufacturers and the United States Chamber of Commerce to challenge the law in court.

Last year, over a thousand companies filed their first minerals reports with the S.E.C. Now Global Witness and Amnesty International have published an analysis of about 100 of these documents, submitted by many of America's biggest corporations. The results are sobering. Of their sample, 85 percent had not contacted or attempted to contact the smelters or refiners that processed their minerals. Forty-one percent could not show that they had a policy to identify risks in their supply chain. Only 16 percent could indicate what country their minerals came from. The results reveal that most companies are unaware of whether or not their products contain minerals that have been sold to fund violence.

This is unacceptable. When the next round of reports is filed this year, investors and consumers should be able to see verifiable improvement.

Businesses that don't comply with this legislation must receive adequate punishment. The S.E.C. has the authority to sanction companies that fail to file minerals reports, or file false or misleading documents. In practice, however, S.E.C. action would likely require pressure from investors; this is a step each one of us can take. An executive order passed in July could also be invoked to penalize individuals or companies that support Congo's armed groups "through the illicit trade in natural resources."

Example 2: Kim and Davis [2016] find that in 2014, 80% of Companies Don't Know If Their Products Contain Conflict Minerals.

"Eligible companies had more than three years to investigate their supply chains; the first disclosure reports were due in May 2014. We now have three years' worth of reports in hand, and our analysis, published in the Academy of Management Journal, shows that giant multinational corporations often have little idea where their raw materials come from.
We analyzed every conflict minerals report submitted to the SEC in 2014, 2015, and 2016 (though our paper only includes results for the first two years). Filing companies were primarily based in

the U.S. but they included foreign firms listed on U.S. stock markets. Using computerized content analysis and human coders, we categorized every company into one of three groups: "DRC conflict-free," for companies that certify that their products are free of DRC conflict minerals beyond a reasonable doubt; "no reason to believe," a somewhat lower standard of evidence, implying that it is more likely than not that products are conflict-free; and "DRC conflict undeterminable," for those that were unable to answer the question with reasonable certainty. Firms could also admit that their products contained DRC conflict minerals, but thus far none have done so.

Only about 1% of the companies were able to declare that their products were conflict-free beyond a reasonable doubt. Of the rest, 19% declared that they had no reason to believe their products contained DRC conflict minerals. The remaining 80% admitted that they were unable to determine their raw materials' country of origin.
Two things stood out to us. First, the more global the company (in terms of the range of countries it operated in and the proportion of its sales made outside the U.S.), the less likely it was to declare its products conflict-free. Second, the bigger and more dispersed the supply chain (we created this measure using data from Bloomberg), the less likely the company was to declare itself conflict-free.

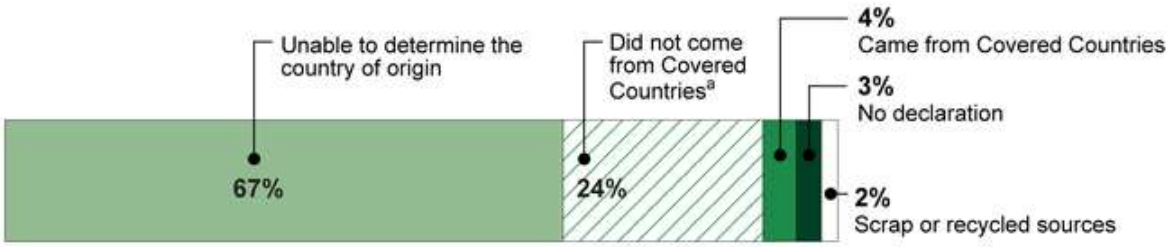
We also interviewed a dozen supply chain executives, lawyers, and activists, who told us that their supply chains were simply too complex to track every input. Most notable brands are typically several tiers removed from actual smelters and mining sites that produce the minerals that go into their products. For example, for companies to know where their tantalum comes from — the metal is widely used by the electronics, chemical, pharmaceutical, and aircraft turbine industries — they need to survey their suppliers and persuade them to survey *their* suppliers, and so on. If suppliers don't bother to respond to the survey or cannot persuade their own suppliers to respond, the inquiry grinds to a halt, leaving the company in the dark."

Example 3: The U.S. Government Accountability Office (GAO) report titled "SEC Conflict Minerals Rule: Initial Disclosures Indicate Most Companies Were Unable to Determine the Source of Their Conflict Minerals"

"According to a generalizable sample GAO reviewed, company disclosures filed with the Securities and Exchange Commission (SEC) for the first time in 2014 in response to the SEC conflict minerals disclosure rule indicated that most companies were unable to determine the source of their conflict minerals. Companies that filed disclosures used one or more of the four "conflict minerals"—tantalum, tin, tungsten, and gold—determined by the Secretary of State to be financing conflict in the Democratic Republic of the Congo (DRC) or adjoining countries. Most companies were based in the United States (87 percent). Almost all of the companies (99 percent) reported performing country-of-origin inquiries for conflict minerals used. Companies GAO spoke to cited difficulty obtaining necessary information from suppliers because of delays and other challenges in communication. Most of the companies (94 percent) reported exercising due diligence on the source and chain of custody of conflict minerals used. However, most (67 percent) were unable to determine whether those minerals came from the DRC or adjoining countries (Covered Countries), and none could determine whether the minerals financed or benefited armed groups in those countries. Companies that disclosed that conflict minerals in their products came from covered countries (4 percent) indicated that they are or will be taking action to address the

risks associated with the use and source of conflict minerals in their supply chains. For example, one company indicated that it would notify suppliers that it intends to cease doing business with suppliers who continue to source conflict minerals from smelters that are not certified as conflict-free."

Types of Company Declarations Reported in Response to the SEC Conflict Minerals Disclosure Rule in 2014



Source: GAO. | GAO-15-561

APPENDIX V
List of Experts

The table below lists the names and roles of people that we held private discussions with about the finding of our paper. While we do not quote specific people in the paper, we confirmed and validate our description of institutional background, our assumptions, and our results,

Entity	Contact Person	Role	Additional info
Apple	Annie Signorelli	Responsible Sourcing Lead	Annie Signorelli engages companies, industry associations, affected communities, civil society, policymakers, and investors on responsible sourcing policies and human rights due diligence. She is passionate about developing creative and impactful strategies that leverage the power of responsible business to build a more just and equitable world.
Development International	Christopher Bayer	Principal Investigator	Chris Bayer is an international development practitioner and academic with two decades of experience in research design and execution. Chris has worked in the DRC, Kenya, South Africa, Ghana, Burkina Faso, Cote d'Ivoire, Senegal, and in 2012 lectured at the American University of Nigeria. As a consultant for Tulane University, he implemented a number of research and capacity-building projects, which included in-depth studies on human rights and public health issues in agricultural and extractive industries of West Africa and the Great Lakes Region of Africa. Since 2014, Chris has served as Principal Investigator at International Development e.V., a not-for-profit organisation based in Germany that specializes in areas where law, business, and development intersect. Research on corporate Environment, Social and Governance (ESG) performance has included conflict minerals (Dodd-Frank Section 1502), modern slavery (California TISC and UK MSA), and non-financial reporting (EU NFRD studies on Sweden, Germany, and Austria), as well as duty of care (French Duty of Vigilance).
Development International	Jiahua Xu	Research Project Manager at University College London (UCL)	Dr Jiahua Xu is a postdoctoral fellow at the UCL Centre for Blockchain Technologies. Her research interests lie primarily in blockchain economics, behavioural finance, and risk management. She has been a research associate at Harvard Business School. She is the lead data scientist at Development International.
Development International	Juan Ignacio Ibanez	Centre Administrator at UCL CBT, LL.M. in Law & Economics, Juris Doctor, Licentiate in International Relations	Juan Ignacio Ibañez is a research associate at the UCL Centre for Blockchain Technologies and a research affiliate at the Catholic University of Córdoba, Argentina. With a Law and Economics background, his research interests include blockchained triple-entry accounting, blockchain in supply chains and blockchain, energy, and climate. The focus of his work lies on setting the historical record of triple-entry accounting straight, applying accounting categories to distributed ledger technology, and making the economic case for and against distributed ledger technology in particular and blockchain in general. Other works published in affiliation with German NGO Development International e.V. are focused on supply chain transparency.
Government Accountability Office	Kimberly Gianopoulos	Director at U.S. Government Accountability Office	Kimberly Gianopoulos oversees the international trade portfolio in GAO's International Affairs and Trade Team, including such issues as intellectual property, sanctions, free trade agreements, tariffs, export controls, and international government procurement. She concurrently manages 12-15 groups of analysts who travel internationally to complete performance evaluations using government auditing standards. She has testified before Congressional committees several times on a variety of topics including the Dodd-Frank Act, the Export-Import Bank, conflict minerals, and

			Central American migration.
Government Accountability Office	Ryan Vaughan	Assistant Director at U.S. Government Accountability Office	Ryan Vaughan is an assistant director of the U.S. Government Accountability Office. He holds a master's degree in public policy analysis from the University of Southern California and a Bachelor of Arts in Economics and International Relations from Pepperdine University.
IBM	Lily Asia	Responsible Sourcing Project Executive	Lily Asia has extensive professional experience in Supply Chain, Responsible Minerals, Blockchain, Budget Forecast, Capacity Planning, Data Analytics, and Sales. Prior to joining IBM, she worked for Apple, Hewlett-Packard, and Compaq, pre-merger HP. In 2019, she joined IBM's Global Business Services team as a core contributor in the Responsible Sourcing Blockchain Network (RSBN). In August 2020, she was recognized in the Top 100 Corporate Social Responsibility Influence Leaders by Assent. In 2021, she co-authored IBM's Journey in Responsible Minerals Sourcing article on behalf of IBM Corporation.
IPIS	Ken Matthysen	Researcher	Ken Matthysen holds a degree in political and social sciences (University of Antwerp) and obtained a Master of Conflict and Development at Ghent University. In March 2008 he joined IPIS's research team. His focus is on natural resources and security in Central Africa. He has published numerous papers on artisanal and small-scale mining in the eastern DRC.
iTSCi	Kay Nimmo	Representative of the International Tin Association	Kay Nimmo leads environmental, social and governance activities at the International Tin Association, the voice of the world's largest tin producers, and engages with multiple stakeholders, including the artisanal and small scale mining sector. Nimmo graduated with a degree in metallurgy and has a background in successful alloy development. She instigated, developed, and leads a number of industry-critical global activities, including the award-winning International Tin Supply Chain Initiative that addresses links between minerals and conflict financing in supply chains from central Africa and the development of the tin associations' Code of Conduct for responsible production standards in the tin industry.
OECD	Benjamin Katz	National Resources Officer, Economic Growth Office	Benjamin Katz has been a policy analyst for responsible mineral supply chains at the OECD's Centre for Responsible Business Conduct since early 2019. His work at the OECD focuses on sourcing of cobalt and battery materials, mineral sourcing from Central Africa, and measuring the uptake and impact of the OECD Due Diligence Guidance for Responsible Mineral Supply Chains.
OECD	Luca Maiotti	Policy Analyst of Responsible Business Conduct	Luca Maiotti provides technical policy advice on international regulatory initiatives and industry-led initiatives related to responsible business conduct in the extractives sector. He conducts research on human rights abuses, conflict financing, corruption, and money laundering in mineral supply chains. He helps with the design of capacity-building programmes for industry, government and civil society organisations.
Project on Resources and Governance (PRG)	Jihae Hong	Staff member	Jihae Hong holds a master's degree in research methodology and quantitative methods from Columbia University. She also holds a bachelor's degree in Mathematics from the University of Chicago. She works on bringing practitioners and academic researchers together to identify effective developmental interventions.
Responsible Minerals Initiative	Fabiana Di Lorenzo	Senior Director, Responsible	Fabiana Di Lorenzo is a senior director of one of the largest electronic industry associations committed to strengthening companies' abilities to make informed decisions about

		Business Alliance	mineral sourcing. Di Lorenzo leads impact and innovation projects to help members with responsible mining and sourcing practices and serves as the main expert on responsible sourcing of materials used in the digital and green transition, relevant policy, and legal trends as well as on the implementation of the OECD and UNGPs.
Responsible Sourcing Network (RSN)	Raphael Deberdt	Anthropology PhD Student and Minerals Supply Chains Sustainability Consultant	Raphael Deberdt specializes in minerals traceability and corporate efforts to promote sustainable raw commodities supply chains. He works with brand companies to support their due diligence efforts and advocate for more discussion between academia, non-profits, and the industry. He has been mentioned in Bloomberg, Gartner and Le Monde. Raphael holds an MA in International Relations from Sciences Po Lyon, France, an MA in African Studies from Stanford University, an LLM in African Legal Studies from Paris 1 Panthéon Sorbonne University, and an MA in Anthropology at the École des Hautes Études en Sciences Sociales (EHESS). He is now pursuing a PhD in anthropology at the University of British Columbia.
Responsible Trade, LLC	Mike Loch	President	Mike Loch is a recognized leader in the field of Sustainability with significant achievements in developing and launching comprehensive strategies and turning them into world-class programs. He has extensive international experience, demonstrated global leadership, and a strong record of success across numerous international organizations and cultures. He was ranked #1 Conflict Minerals Influence Leader for 2016. He was formerly the director of sustainability at Motorola Solutions.
UCLA	Darin Christensen	Assistant Professor of Public Policy and Political Science and Co-Executive Director and Co-Founder of Project on Resources and Governance (PRG)	Darin Christensen is an assistant professor of Public Policy. He received his Ph.D. in political science and M.A. in economics from Stanford University. Darin studies political economy, focusing on institutions and policies that promote investment and mitigate social conflict in developing countries in sub-Saharan Africa, Southeast Asia, and Latin America. He has consulted on projects for The Asia Foundation, USAID, and The World Bank. Darin is co-founder of the Project on Resources and Governance (PRG) and an affiliate of several academic centers, including the California Center for Population Research, Center for Effective Global Action, Evidence in Governance and Politics, The Luskin Center for Innovation, and UCLA's African Studies Center.
US Labor Department	Pilar Velasquez	Senior International Relations Officer	Pilar Velasquez is a representative of the Public Private Alliance for Responsible Minerals Trade.
US State Department	Alyssa Perkinson	Officer	Alyssa Perkinson works for the Office of Threat Finance Countermeasures, in conjunction with other State Department bureaus and U.S. agencies, to sever the links between mineral resources and conflict through government-to-government diplomatic efforts.
US State Department	Dan Katz	Officer	Dan Katz works for the Office of Threat Finance Countermeasures, in conjunction with other State Department bureaus and U.S. agencies, to sever the links between mineral resources and conflict through government-to-government diplomatic efforts. The office builds international support for due diligence guidelines intended to help develop a responsible minerals trade from conflict-affected and high-risk areas in the African Great Lakes Region. It engages with a variety of domestic and international partners from governments, the business community, and non-governmental organizations to promote

			the creation and use of conflict–free supply chains for gold, tin, tantalum and tungsten. It also assists other U.S. government agencies in providing support to the DRC and adjacent countries to improve transparency and regulatory reform in the minerals sector as part of a comprehensive effort to implement Section 1502 of the Wall Street Consumer Reform and Protection Act. In 2017, the State Department renewed the Public Private Alliance for Responsible Minerals Trade (PPA) for another five years. The PPA is a multi-sector and multi-stakeholder initiative that supports supply chain solutions to conflict minerals challenges in the Democratic Republic of Congo (DRC) and the Great Lakes Region (GLR) of Central Africa.
USAID	Agathe Tshimpanga	Senior Program Manager	Agathe Tshimpanga is an International Development Affairs professional with nearly 17 years of experience. Her area of expertise spans across Democracy, Rights and Governance (DRG) programming including governance, media, rule of law, public policy, legislative support, human rights; sectorial integration; Monitoring Learning and Evaluation (M&E) and HIV community prevention in post-conflict setting. She is responsible for overseeing and ensuring quality design, implementation and monitoring of programs/projects/activities related to the DRG sector, covering all the programming in the areas of Rule of Law and Human Rights, Good Governance, Political Competition and Consensus Building, and Civil Society in the Democratic Republic of Congo (DRC). She maintains an up-to-date understanding of the host government ministries and institutions and play a coordination and collaboration with the (Ministry of Justice and Human Rights, Ministry of Interior, Ministry of Decentralization (MOD), Media and Communication, Education, Electoral Management Body, the Human Rights commission, the parliament, the high council of Magistrates, Extractive Industries Transparency Initiative (EITI) committee, and the Media High Authority), international organizations (IOs), local non-governmental organizations (NGOs), private sectors, and civil society organizations (CSOs). She also serves as a Mission Integration expert promoting DRG integration in other sectors: Health, Education, Economic, Growth.
USAID	Benjamin Skolnik	Environment Foreign Service Officer	Benjamin Skolnik works in the field of international sustainable development and conservation biology. He seeks to build on his practical skills in program management, institutional capacity-building, policy, biodiversity, energy, minerals, and community-based initiatives. He is a Foreign Service Officer at the Responsible Minerals Trade & Power Africa Team Lead, Economic Growth Office, Democratic Republic of Congo.
USAID	Brooke Stearns Lawson	Senior Conflict, Governance and Crime Advisor	Brooke Stearns Lawson is an accomplished international development professional with more than 20 years of experience working in the private sector, government, and civil society. She serves as key representative and collaborator with other U.S. Government agencies and actors, foreign government officials, non-governmental organizations, international partners, and the public. She trains USAID staff and other practitioners on conflict sensitivity, prevention, and management. She leads and participates in a range of working groups across USAID, including technical work (e.g., natural resource management and conflict and violence prevention) and employee engagement (e.g., diversity and inclusion, remote telework).

			She managed a team of five people and a $30 million portfolio as Acting Peace and Security Office Director for USAID/Democratic Republic of Congo .
USAID	Melody McNeil	Director, Central Africa Regional Program for the Environment	Melody McNeil holds a bachelor's degree in economics from Elmira College and a master's degree in agriculture and natural resource economics from Michigan State University. She has been an assistant director of development at UC Davis and has been working with USAID for more than 10 years. Currently, she is in the Democratic Republic of the Congo as a Director of the Central Africa Regional Program for the Environment.

APPENDIX VI
Comment Letters

RCS GLOBAL
Making Sure.

13 March 2017

Dear Acting Chairman Michael S. Piwowar,

RCS Global is one of the world's leading responsible raw materials supply chain audit and advisory groups. Our directors – Harrison Mitchell and Nicholas Garrett were two of the first people to write on conflict minerals in the DRC in 2008, publishing the first supply chain investigation providing evidence of the link between the global electronics industry's supply chains and militarized mining in North Kivu in the Financial Times and – publishing "Trading Conflict for Development" for the UK Department for International Development and "Beyond Conflict" for the World Bank, both in 2009.

Over the past 10 years we have worked extensively on conflict minerals all along the supply chain - upstream in the DRC conducting audits or reviews, midstream with smelters and manufacturers in China and downstream, helping companies develop strategy and responses to DF1502.

While we were initially skeptical of the potential impact of DF1502 on conflict dynamics in the region, which are subject to broader geopolitical events, looking back its clear that the rule has dramatically increased transparency in mineral supply chains and in doing so provided much needed insight into the structures which enable extreme poverty, child- and forced labor and human rights abuse, including conflict.

This transparency, which is in place all the way from SEC issuers to mine sites in the DRC, is not total or perfect, but it achieves two important strategic objectives:

- It prevents large scale abuses occurring as companies are required and enabled to be more aware of risks in their supply chain and act upon their discovery.
- It acts as an enabling agent for positive interventions in the supply chain such as minimum good practice standards for extraction and trade, fairer pricing, and better market access for good suppliers.

To put this another way – in order for an industry to enact any positive change at a mine site or smelter, it first has to know who that miner or smelter is.

One key question the SEC is deliberating is - what does the future look like if DF1502 is repealed?

It's certainly true that some industries are likely to stop meeting DF1502 obligations, but for others, such as the electronics sector the genie is out of the bottle and responsible sourcing commitments are slowly but surely becoming the norm, rather than the exception. Indeed, while a number of companies have

provided submissions to the SEC referring to the cost of compliance, the cost of non-compliance also needs to be pointed out. These include loss of brand reputation, including through supply chain activism and press coverage as is evident in the cobalt sector presently, legal challenges, and an inability to meet demands of an increasingly sophisticated and aware group of investors and consumers.

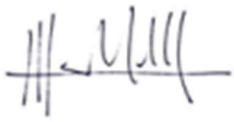
This is not just our opinion. A recent survey we conducted of 20 global leaders in responsible sourcing from the private, public and non-profit sector confirmed that pressure from governments, civil society, investors and consumers will both ensure companies continue efforts to source responsibly and will require them to adapt and respond to new challenges in their supply chains.

In summary, liability for SEC issuers will not end simply because a rule is repealed, but the rule can provide issuers with clarity on what their activities should be as well as promote transparency in the whole supply chain. Looking forward, the SEC might wish to provide greater freedom for companies to adopt approaches best suited to their circumstance – so long as these remain within the framework of the internationally recognized OECD Due Diligence Guidance, which is applicable to all minerals and metals globally and has been accepted by the market as the go to good practice guideline in the responsible sourcing context. Approaches compliant with this framework, can and should also be validated as compliant by a qualified auditor and the efforts involved in companies' approaches should be made public.

This approach would enable companies to adopt measures appropriate to their circumstance, be accountable to a qualified third party and the public, while at the same time supporting the supply chain transparency crucial for the responsible sourcing of raw materials.

We wish you the best in your deliberations.

Yours Sincerely,



Harrison Mitchell

Dr. Nicholas Garrett

Directors, RCS Global

www.rcsglobal.com

APPENDIX VII
Form Specialized Disclosure

SD 1 d383904dsd.htm FORM SD

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM SD
Specialized Disclosure Report

Apple Inc.
(Exact name of registrant as specified in its charter)

California	001-36743	94-2404110
(State or other jurisdiction of incorporation or organization)	(Commission File Number)	(IRS Employer Identification No.)

1 Infinite Loop
Cupertino, California 95014
(Address of principal executive offices) (Zip Code)

D. Bruce Sewell
Senior Vice President,
General Counsel and Secretary
(408) 996-1010
(Name and telephone number, including area code, of the person to contact in connection with this report.)

Check the appropriate box to indicate the rule pursuant to which this form is being filed, and provide the period to which the information in this form applies:

☒ Rule 13p-1 under the Securities Exchange Act (17 CFR 240.13p-1) for the reporting period from January 1 to December 31, 2016.

Section 1 – Conflict Minerals Disclosure

Items 1.01 and 1.02 Conflict Minerals Disclosure and Report, Exhibit

Conflict Minerals Disclosure
A copy of Apple Inc.'s ("Apple's") Conflict Minerals Report for the reporting period January 1, 2016 to December 31, 2016 is provided as Exhibit 1.01 hereto and is publicly available at investor.apple.com/sec.cfm. Apple's determination and related disclosures relating to materials that may come from recycled and scrap sources are included in Apple's Conflict Minerals Report and incorporated by reference herein.

Section 2 – Exhibits

Item 2.01 Exhibits

Exhibit 1.01 – Conflict Minerals Report for the reporting period January 1, 2016 to December 31, 2016.

* * * * *

2

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the duly authorized undersigned.

Apple Inc.

By: /s/ D. Bruce Sewell Date: May 5, 2017
D. Bruce Sewell
Senior Vice President,
General Counsel and Secretary

3

EXHIBIT INDEX

Exhibit Number	Description
1.01	Conflict Minerals Report for the reporting period January 1, 2016 to December 31, 2016.

4

Source: https://www.sec.gov/Archives/edgar/data/0000320193/000119312517159397/d383904dsd.htm

APPENDIX VII - Continued
Exhibit Conflict Minerals Report

Exhibit 1.01

CONFLICT MINERALS REPORT

Summary of Apple's Commitment

Apple is deeply committed to upholding human rights and using minerals in its products that do not directly or indirectly finance armed conflict or benefit armed groups. Apple works to safeguard the well-being of people involved in its supply chain and to protect the place where these materials are found. As of December 31, 2017—for the third straight year—100 percent of identified smelters and refiners* in Apple's supply chain for all applicable products manufactured during calendar year 2017 participated in an independent third-party conflict minerals audit ("Third Party Audit") program for gold, columbite-tantalite (coltan), cassiterite, wolframite, tantalum, tin, and tungsten (collectively, "conflict minerals"). In 2017, Apple directed its suppliers to remove from its supply chain 10 smelters and refiners not willing to participate in, or complete, a Third Party Audit within given timelines.

Reaching and maintaining 100 percent participation is significant because Apple believes Third Party Audits are the foundation of a strong due diligence program. However, to help end abuses caused by conflict and to protect human rights, further measures beyond Third Party Audits are needed. Apple believes human rights considerations are fundamental. Apple works hard to go beyond basic requirements in order to meet and exceed internationally accepted due diligence standards. The company also takes additional steps to help protect people in its supply chain, with the ultimate goal of improving conditions on the ground in the Democratic Republic of the Congo ("DRC") and adjoining countries.

Apple's commitment goes beyond basic requirements in a number of ways. First, while Apple requires its suppliers to ensure that conflict minerals smelters and refiners in its supply chain participate in Third Party Audit programs, it also maintains a strict Supplier Code of Conduct and Supplier Responsibility Standards that pertain to Apple's partners at all levels. Second, Apple now instructs its suppliers to engage with smelters and refiners in its supply chain to assess and identify a broader range of risks beyond conflict risk. Third, by supporting the expansion of a whistleblowing mechanism, Apple supports initiatives that foster independent, local voices that can raise issues and report abuses at the mine-site level and throughout the supply chain, which Apple believes ultimately will help improve conditions for people living in the DRC and beyond. Finally, Apple annually reviews reported supply chain incidents and public allegations of abuse, potentially linked to certain smelters and refiners in the supply chain, and uses that information to help improve conflict minerals traceability schemes and Third Party Audit programs.

* 250 in total as of December 31, 2017.

Source: https://www.sec.gov/Archives/edgar/data/320193/000119312518073716/d538673dex101.htm

APPENDIX VIII
Examples of Conflicts

- On 19 February 2011, FLDR rebels are witnessed committing 56 rapes in a town in Sud-Kivu in four days.
- On 13 March 2011, Eight civilians were killed and dozens abducted during an attack on a village by Lords Resistance Army rebels in the Central African Republic mining town of Nzako on Sunday. Between 30 and 50 people were abducted by the rebels, and dozens of properties were looted and/or burnt. 3 more people died while being detained by the group.
- On 03 May 2011, FDLR rebels and Mayi Mayi militia (DRC) members attack civilians around the Hauts Plateaux of Bijombo. Reports of looting and raping.
- On 01 September 2012, LRA raided Balifondo and Zobe Mbari villages of Bangassou in Mbomou on 1 September, abducting 55 people, mostly girls, including 41 in Balifondo. 52 girls were released a week later by the LRA. They were reportedly sexually abused while being detained.
- On 11 January 2013, ADF-NALU attacked civilians in Kiravo, Mbau. They pillaged and raped 2 women.
- On 15 January 2013, FDLR rebels carried out 28 rapes in Lubero throughout January.
- On 15 April 2013, M23 & FDLR rebels are carrying out abuses on civilians including looting, sexual harassment and violence.
- On 08 March 2015, more than 100 FRPI fighters armed with guns and knives attacked the Lagabo IDP camp. They reportedly seriously injured 12 people with machetes and raped a woman who refused to help them carry looted goods for them. Soldiers later arrived but the men had already left the area.
- On 12 May 2015, as many as 37 people were killed by armed men wielding axes and machetes in two villages, Sabu and Mapiki, in the Mbau area. Thousands of people have fled following the violence. The attack is attributed to the ADF.
- On 15 and 16 July 2015, FRPI elements allegedly raped three women and two girls at Koni village near Aveba.
- On 18 June 2017, 10 LRA fighters attacked a mining camp near Gangala. They looted gold, diamonds and money, and abducted 8 artisanal miners.
- On 06 June 2017, LRA forces armed with automatic weapons raided 2 communities near Gangala, abducting 10 civilians. They then looted food, gold, and diamonds from the mine near Gangala.
- On 24 Oct 2018, ADF militiamen attacked Bakaiku neighborhood of Oicha rural commune. They killed three people and burned houses and vehicles before being repelled by the FARDC. The attackers also looted goats, drugs and other property.

Source: ACLED (acleddata.com)

REFERENCES

ALMEIDA, H., I. CUNHA, M.A. FERREIRA, and F. RESTREPO. 'The Real Effects of Credit Ratings: The Sovereign Ceiling Channel.' The Journal of Finance 72 (2917)(1): 249-290.

AMIR, E., Y. GUAN, and D. OSWALD. 'The Effect of Pension Accounting on Corporate Pension Asset Allocation.' Review of Accounting Studies 15 (2010)(2): 345-366.

AMORE, M.D., and M. BENNEDSEN. 'The Value of Local Political Connections in a Low-Corruption Environment.' Journal of Financial Economics 110 (2013)(2): 387-402.

ANGRIST, J.D. and J.S. PISCHKE. 'Instrumental Variables in Action: Sometimes You Get What You Need.' Mostly Harmless Econometrics: An Empiricist's Companion (2009): 113-220.

AUTESSERRE, S. 'Dangerous Tales: Dominant Narratives on the Congo and Their Unintended Consequences.' African Affairs 111 (2012)(443): 202-222.

AUTY, R.M. Sustaining Development in Mineral Economies: The Resource Curse Thesis. London: Routledge, 1993.

AUTY, R.M. 'The Political Economy of Resource-Driven Growth.' European Economic Review 45 (2001) (4-6): 839-846.

BAFILEMBA, F., T. MUELLER, and S. LEZHNEV. 'The Impact of Dodd-Frank and Conflict Minerals Reforms on Eastern Congo's Conflict.' The Enough Project, 2014.

BENABOU, R. and J. TIROLE. 'Individual and Corporate Social Responsibility.' Economica, 77 (2010)(305): 1-19.

BENS, D.A., and S.J. MONAHAN. 'Altering Investment Decisions to Manage Financial Reporting Outcomes: Asset-Backed Commercial Paper Conduits and FIN 46.' Journal of Accounting Research 46 (2008)(5): 1017-1055.

BERMAN, N. and M. COUTTENIER. 'External Shocks, Internal Shots: The Geography of Civil Conflicts.' Review of Economics and Statistics 97 (2015)(4): 758-776.

BERMAN, N., M. COUTTENIER, D. ROHNER, and M. THOENIG. 'This Mine Is Mine! How Minerals Fuel Conflicts in Africa.' American Economic Review 107 (2017) (6): 1564-1610.

BERTRAND, M., E. DUFLO, and S. MULLAINATHAN. 'How Much Should We Trust Differences-in-Differences Estimates?' The Quarterly Journal of Economics 119 (2004)(1): 249-275.

BESLEY, T., and M. REYNAL-QUEROL. 'The Legacy of Historical Conflict: Evidence from Africa.' American Political Science Review (2014): 319-336.

BEYER, A., D.A. COHEN, T.Z. LYS, and B.R. WALTHER. 'The Financial Reporting Environment: Review of the Recent Literature.; Journal of Accounting and Economics 50 (2010) (2-3): 296-343.

BIRKEY, R.N., R.P. GUIDRY, M.A. ISLAM, and D.M. PATTEN. 'Mandated Social Disclosure: An Analysis of the Response to the California Transparency in Supply Chains Act of 2010.' Journal of Business Ethics 152 (2018)(3): 827-841.

BOND, P., A. EDMANS. and I. GOLDSTEIN. 'The Real Effects of Financial Markets.' Annual Review of Financial Economics 4 (2012)(1): 339-360.

CHASE, M. 'Conflict Minerals and the Democratic Republic of Congo.' San Francisco: Business for Social Responsibility, 2010. Retrieved from: http://www. bsr. org/reports/BSR_ Conflict_Minerals_and_the_DRC. pdf.

CAO, Y., J.N. MYERS, L.A. MYERS, and T.C. OMER. 'Company Reputation and the Cost of Equity Capital.' Review of Accounting Studies 20 (2015)(1): 42-81.

CBS EVENING NEWS. 'Boycott Nike.' CBS News (1996)

CHENG, Q., Y.J. CHO, and H. YANG. 'Financial Reporting Changes and the Internal Information Environment: Evidence from SFAS 142.' Review of Accounting Studies 23 (2018)(1): 347-383.

CHRISTENSEN, H.B. 'Is Corporate Transparency the Solution to Political Failure on our Greatest Problems?' JAE Day 1 Livestream. (2021) https://www.youtube.com/watch?v=NvyfL02IUT0

CHRISTENSEN, H.B., E. FLOYD, L.Y. LIU, and M. MAFFETT. 'The Real Effects of Mandated Information on Social Responsibility in Financial Reports: Evidence from Mine-Safety Records.' Journal of Accounting and Economics 64 (2017)(2-3): 284-304.

CHRISTENSEN, H.B., L. HAIL, and C. LEUZ. 'Mandatory CSR and Sustainability Reporting: Economic Analysis and Literature Review.' Review of Accounting Studies (2021): 1-73.

CHRISTENSEN, H.B., M.G. MAFFETT, and T. RAUTER. 'Reversing the Resource Curse: Foreign Corruption Regulation and Economic Development.' (2021) Available at SSRN 3712693.

COLLIER, P., A. HOEFFLER, and D. ROHNER. 'Beyond Greed and Grievance: Feasibility and Civil War.' Oxford Economic Papers 61 (2009)(1): 1-27.

CUNY, C., O. EVEN-TOV, and E.M. WATTS. 'From Implicit to Explicit: The Impact of Disclosure Requirements on Hidden Transaction Costs.' Journal of Accounting Research 59 (2021)(1): 215-242.

DAMBRA, M., O. EVEN-TOV, and J. NAUGHTON. 'The Economic Consequences of GASB Financial Statement Disclosure.' Working Paper, 2021.

DERRIEN, F., and A. KECSKÉS. 'The Real Effects of Financial Shocks: Evidence from Exogenous Changes in Analyst Coverage.' The Journal of Finance 68 (2013)(4): 1407-1440.

DHALIWAL, D.S., and S.S. REYNOLDS. 'The Effect of the Default Risk of Debt on the Earnings Response Coefficient.' The Accounting Review (2019): 412-419.

DYRENG, S.D., J.L. HOOPES, and J.H. WILDE. 'Public Pressure and Corporate Tax Behavior.' Journal of Accounting Research 54 (2016)(1): 147-186.

GEENEN, S. 'A Dangerous Bet: The Challenges of Formalizing Artisanal Mining in the Democratic Republic of Congo.' Resources Policy 37 (2012)(3): 322-330.

GILJE, E.P., and J.P. TAILLARD. 'Do Private Firms Invest Differently than Public Firms? Taking Cues from the Natural Gas Industry.' The Journal of Finance 71 (2016)(4): 1733-1778.

GOW, I.D., D.F. LARCKER, and P.C. REISS. 'Causal Inference in Accounting Research.' Journal of Accounting Research 54 (2016)(2): 477-523.

GREWAL, J., E.J. RIEDL, and G. SERAFEIM. 'Market Reaction to Mandatory Nonfinancial Disclosure.' Management Science 65 (2019)(7): 3061-3084.

GYLFASON, T. 'Natural Resources, Education, and Economic Development.' European Economic Review 45 (2011)(4-6): 847-859.

HAINMUELLER, J., and Y. XU. 'Ebalance: A Stata Package for Entropy Balancing.' Journal of Statistical Software 54 (2013)(7).

HARARI, M., and E.L. FERRARA. 'Conflict, Climate, and Cells: A Disaggregated Analysis.' Review of Economics and Statistics 100 (2018)(4): 594-608.

HARTZMARK, S.M. and A.B. SUSSMAN. 'Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows.' Journal of Finance 74 (2019)(6): 2789–2837.

HEALY, P.M., and K.G. PALEPU. 'Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature.' Journal of Accounting and Economics 31 (2001)(1-3): 405-440.

HEALY, P.M. and G. SERAFEIM. 'Voluntary, Self-Regulatory, and Mandatory Disclosure of Oil and Gas Company Payments to Foreign Governments.' Accounting Horizons 34 (2020)(1): 111-129.

HEFFERNAN, I. 'Peace Diamonds: Combating Civil War with a Diamond Certification Scheme.' (2016).

HONG, H., and L. KOSTOVETSKY. 'Red and Blue Investing: Values and Finance.' Journal of Financial Economics 103 (2012)(1): 1-19.

HOMBACH, K., and T. SELLHORN. 'Firm Value Effects of Targeted Disclosure Regulation: The Role of Reputational Costs.' (2018). Available at SSRN 3204505.

INTERNATIONAL RESOURCE PANEL, UNITED NATIONS ENVIRONMENT PROGRAMME. SUSTAINABLE CONSUMPTION AND PRODUCTION BRANCH. Decoupling Natural Resource Use and Environmental Impacts from Economic Growth. UNEP/Earthprint, 2011.

IOANNOU, I., and G. SERAFEIM. 'The Consequences of Mandatory Corporate Sustainability Reporting.' Harvard Business School Research Working Paper (11-100), 2017.

ISLAM, M.A. and C.J. VAN STADEN. 'Social Movement NGOs and the Comprehensiveness of Conflict Mineral Disclosures: Evidence from Global Companies.' Accounting, Organizations and Society 65 (2018): 1-19.

KANG, J., M. LOUMIOTI, and R. WITTENBERG-MOERMAN. 'The Harmonization of Lending Standards within Banks through Mandated Loan-Level Transparency.' Journal of Accounting and Economics (2021).

KALKANCI, B., and E.L. PLAMBECK. 'Managing Supplier Social and Environmental Impacts with Voluntary Versus Mandatory Disclosure to Investors.' Management Science 66 (2020)(8): 3311-3328.

KANODIA, C., and H. SAPRA. 'A Real Effects Perspective to Accounting Measurement and Disclosure: Implications and Insights for Future Research.' Journal of Accounting Research

54 (2016)(2): 623-676.

KHAN, U., S.G. RYAN, and A. VARMA. 'Fair Value Versus Amortized Cost Measurement and the Timeliness of Other-than-Temporary Impairments: Evidence from the Insurance Industry.' The Accounting Review 94 (2019)(6): 285-307.

KIM, Y.H., and G.F. DAVIS. 'Challenges for Global Supply Chain Sustainability: Evidence from Conflict Minerals Reports.' Academy of Management Journal 59 (2016)(6): 1896-1916.

KRAFT, T., L. VALDÉS, and Y. ZHENG. 'Motivating Supplier Social Responsibility under Incomplete Visibility.' Manufacturing & Service Operations Management 22 (2020)(6): 1268-1286.

KRUEGER, P., Z. SAUTNER, D.Y. TANG, and R. ZHONG. 'The Effects of Mandatory ESG Disclosure around the World.' Available at SSRN 3832745, 2021.

LECHNER, M. 'The Estimation of Causal Effects by Difference-in-Difference Methods. Foundations and Trends (R) in Econometrics 4 (2011)(3): 165-224.

LEUZ, C. 'Evidence-Based Policymaking: Promise, Challenges and Opportunities for Accounting and Financial Markets Research.' Accounting and Business Research 48 (2018)(5): 582-608.

LEUZ, C., and R. VERRECHIA. 'The Economic Consequences of Increased Disclosure.' Journal of Accounting Research 38 (2000): 91-123

LEUZ, C., and P.D. WYSOCKI. 'The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research.' Journal of Accounting Research 54 (2016)(2): 525-622.

LOUGHRAN, T., and B. MCDONALD. 'The Use of EDGAR Filings by Investors.' Journal of Behavioral Finance 18 (2017)(2): 231-248.

LYNN, D.M. 'The Dodd-Frank Act's Specialized Corporate Disclosure: Using the Securities Laws to Address Public Policy Issues.' Journal of Business & Technology Law 6 (2011): 327.

MEHLUM, H., K. MOENE, and R. TORVIK. 'Institutions and the Resource Curse.' The Economic Journal 116 (2006)(508): 1-20.

NOVAK, J., and P. BILINSKI. 'Social Stigma and Executive Compensation.' Journal of Banking and Finance 96 (2018): 169–184.

PARKER, D.P., and B. VADHEIM. 'Resource Cursed or Policy Cursed? US Regulation of Conflict Minerals and Violence in the Congo.' Journal of the Association of Environmental and Resource Economists 4 (2017)(1): 1-49.

POLITY, I.V. 'Political Regime Characteristics and Transitions, 1800-2015: Dataset Users' Manual.' Center for Systemic Peace Report Project (2016).

PRENDERGAST, J., and F. BAFILEMBA. Congo Stories: Battling Five Centuries of Exploitation and Greed. UK: Hachette, 2018.

PROTESS, B. 'Unearth Exotic Provisions Buried in Dodd-Frank' The New York Times Deal Book (2011)

RADLEY, B., and C. VOGEL. 'Fighting Windmills in Eastern Congo? The Ambiguous Impact of the 'Conflict Minerals' Movement.' The Extractive Industries and Society 2(3) (2015): 406-

410.

RALEIGH, C., A. LINKE, H. HEGRE, and J. KARLSEN. 'Introducing ACLED: An Armed Conflict Location and Event Dataset: Special Data Feature.' Journal of Peace Research 47 (2010)(5): 651-660.

RAUTER, T. 'The Effect of Mandatory Extraction Payment Disclosures on Corporate Payment and Investment Policies Abroad.' Journal of Accounting Research 58 (2020)(5): 1075-1116.

ROBINSON, J.A., R. TORVIK, and T. VERDIER. 'Political Foundations of the Resource Curse.' Journal of Development Economics 79 (2006)(2): 447-468.

ROSS, M.L. 'What Do We Know about Natural Resources and Civil War?' Journal of Peace Research 41 (2004)(3): 337-356.

ROYCHOWDHURY, S., N. SHROFF, and R.S. VERDI. 'The Effects of Financial Reporting and Disclosure on Corporate Investment: A Review.' Journal of Accounting and Economics 68 (2019)(2-3): 101246.

SACHS, J.D., and A.M. WARNER. Natural Resource Abundance and Economic Growth (No. w5398). National Bureau of Economic Research, 1995.

SEAY, L. 'What's Wrong with Dodd-Frank 1502? Conflict Minerals, Civilian Livelihoods, and the Unintended Consequences of Western Advocacy.' Center for Global Development Working Paper (284), 2012.

SECURITIES AND EXCHANGE COMMISSION (SEC). 'Final Rule: Conflict Minerals (November).' 2012. Retrieved from: https://www.sec.gov/rules/final/2012/34-67716.pdf

SERFLING, M. 'Firing Costs and Capital Structure Decisions.' The Journal of Finance 71 (2016)(5): 2239-2286.

SHE, G. 'The Real Effects of Mandatory Nonfinancial Disclosure: Evidence from Supply Chain Transparency.' The Accounting Review (2021).

SHLEIFER, A., and R.W. VISHNY. 'Large Shareholders and Corporate Control.' Journal of Political Economy 94 (1986)(3, Part 1): 461-488.

SHROFF, N. 'Corporate Investment and Changes in GAAP.' Review of Accounting Studies 22 (2017)(1): 1-63.

STEINMEIER, M., and M. STICH. 'Does Sustainability Assurance Improve Managerial Investment Decisions?' European Accounting Review 28 (2019)(1): 177-209.

STOOP, N., M. VERPOORTEN, and P. VAN DER WINDT. 'More Legislation, More Violence? The Impact of Dodd-Frank in the DRC.' PloS one 13 (2018)(8), p.e0201783.

STULZ, R.M. 'Hedge Funds: Past, Present, and Future.' Journal of Economic Perspectives, 21 (2007)(2): 175-194.

U.N. SCOR, 65th Sess., 6324th mtg., U.N. Doc. S/PV.6324 (May 28, 2010), available from https://undoc.org/en/S/PV.6324

VOGEL, C., and T. RAEYMAEKERS. 'Terr (it) or (ies) of Peace? The Congolese Mining Frontier and the Fight Against "Conflict Minerals".' Antipode 48 (2016)(4): 1102-1121.

WANG, Z., A. LEE, and M. POLONSKY. 'Egregiousness and Boycott Intensity: Evidence from

the BP Deepwater Horizon Oil Spill.' Management Science 64 (2018)(1): 149-163.

WARFIELD, T.D., J.J. WILD, and K.L. WILD. 'Managerial Ownership, Accounting Choices, and Informativeness of Earnings.' Journal of Accounting and Economics 20 (1995)(1): 61-91.

WEIL, D., A. FUNG, M. GRAHAM, and E. FAGOTTO. 'The Effectiveness of Regulatory Disclosure Policies.' Journal of Policy Analysis and Management: The Journal of the Association for Public Policy Analysis and Management 25 (2006)(1): 155-181.

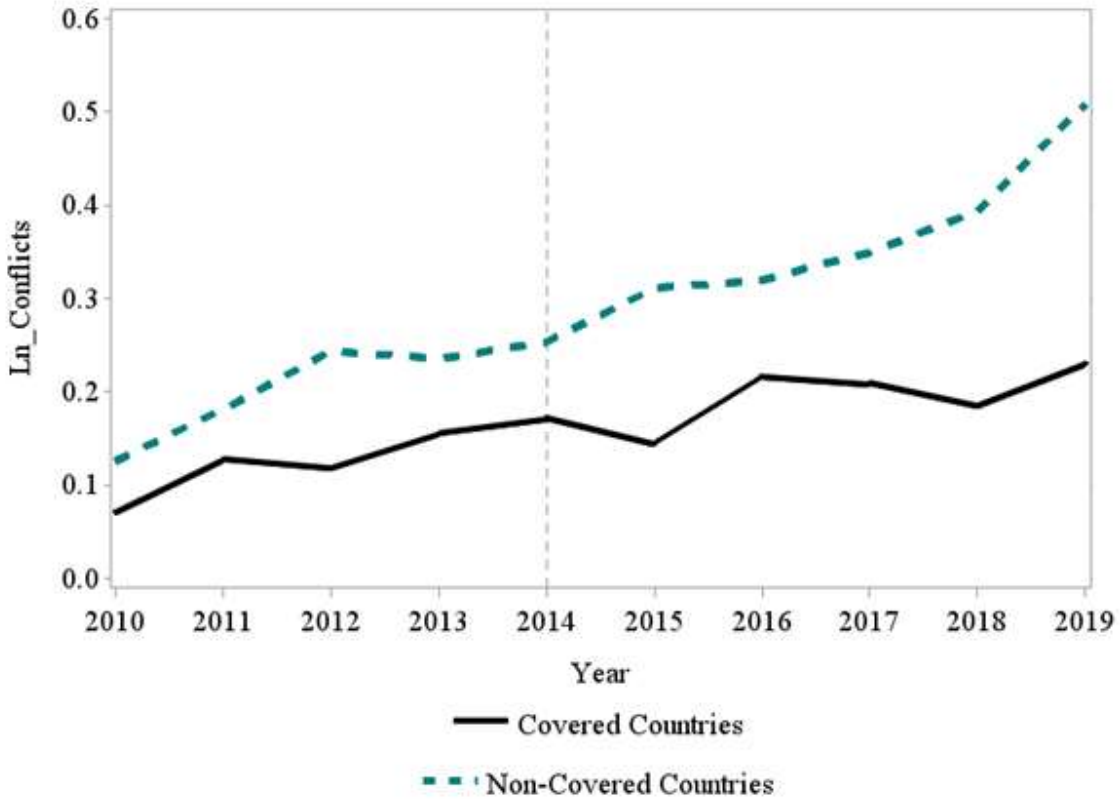
YAWAR, S., and S. SEURING. 'Management of social issues in supply chains: a literature review exploring social issues, actions and performance outcomes.' Journal of Business Ethics 141 (2017)(3): 621-643.

ZHANG, H. 'Effect of Derivative Accounting Rules on Corporate Risk-Management Behavior.' Journal of Accounting and Economics 47 (2009)(3): 244-264.

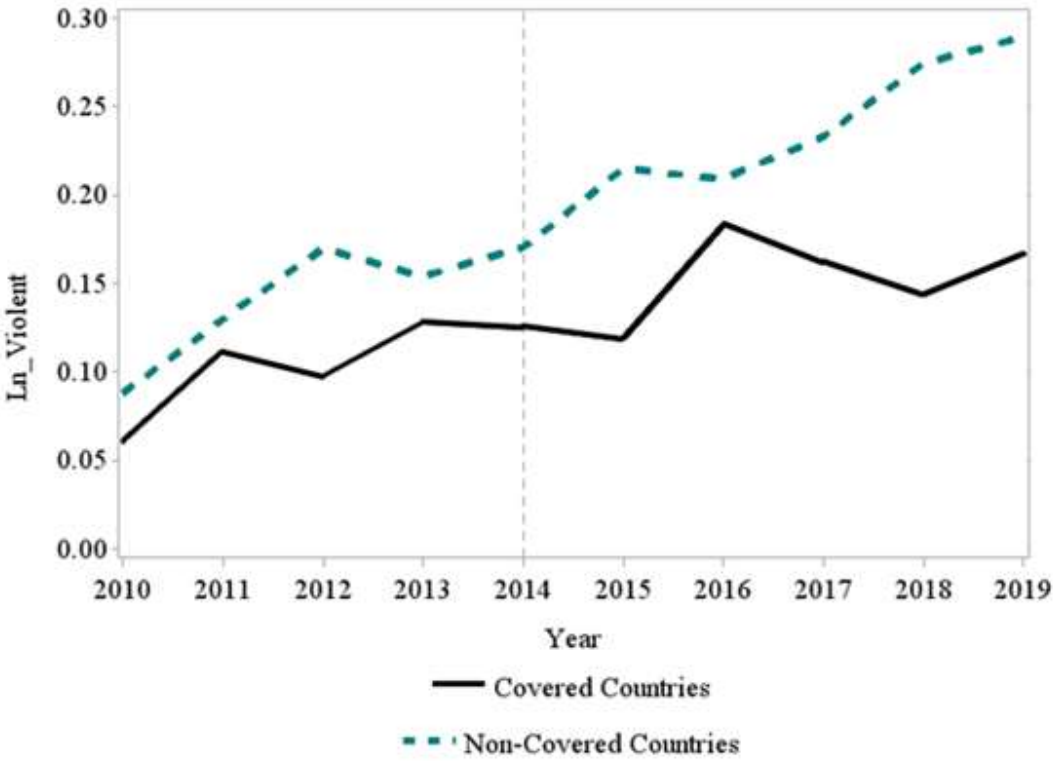
Figure 1
Time-Series Variation in Conflicts for Covered or Non-Covered Countries

This figure presents plots for the natural log-adjusted conflicts in covered countries (solid line) and non-covered countries (dashed-line) over our sample period. Panel A shows the variation in the natural log-adjusted number of all conflicts. Panel B shows the variation in natural log-adjusted violent conflicts. Panel C shows the variation in natural log-adjusted non-violent conflicts. For each panel, years are displayed on the x-axis. The vertical dashed line partitions our sample by pre- and post-Conflict Minerals Disclosure (CMD) years (i.e., 2010 to 2014 are pre-CMD and 2015 to 2019 are post-CMD). All variables are defined in Appendix I.

Panel A. Ln Conflicts



Panel B. Ln Violent



Panel C. Ln Non-Violent

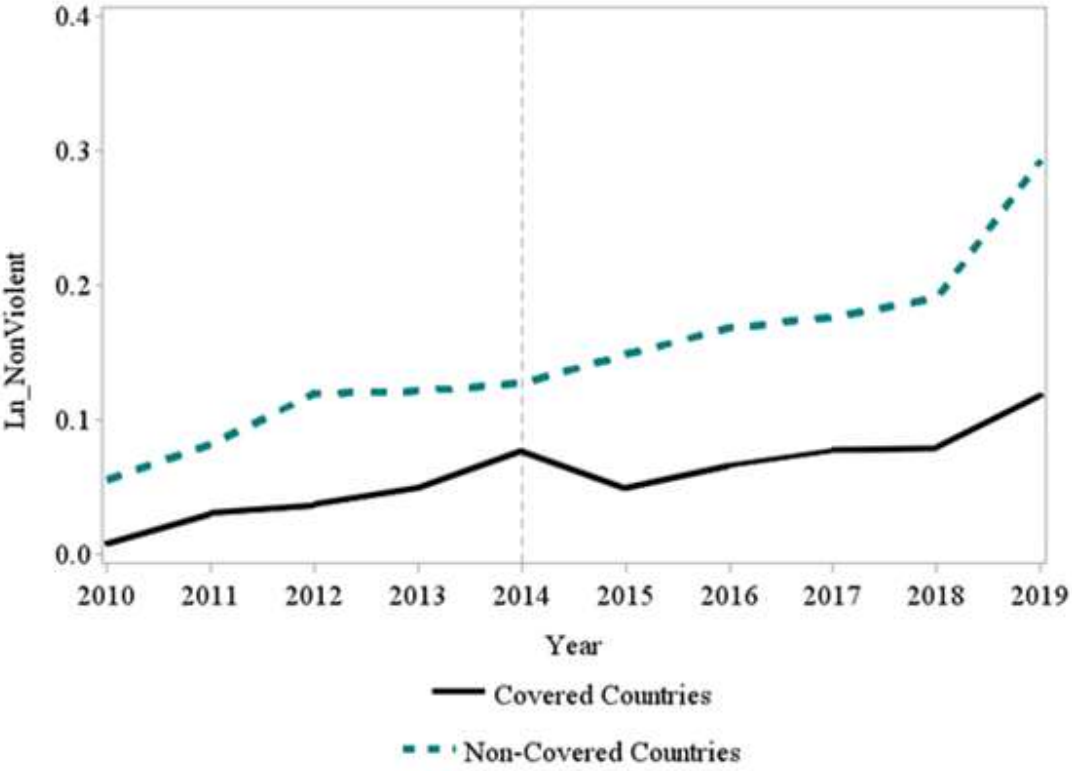
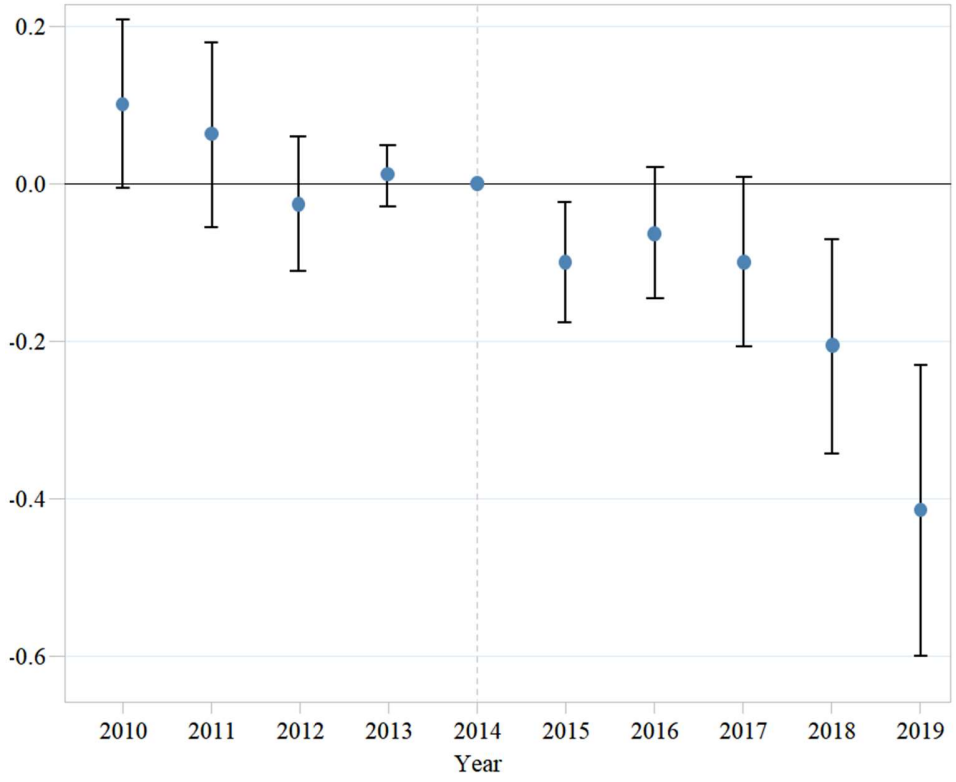


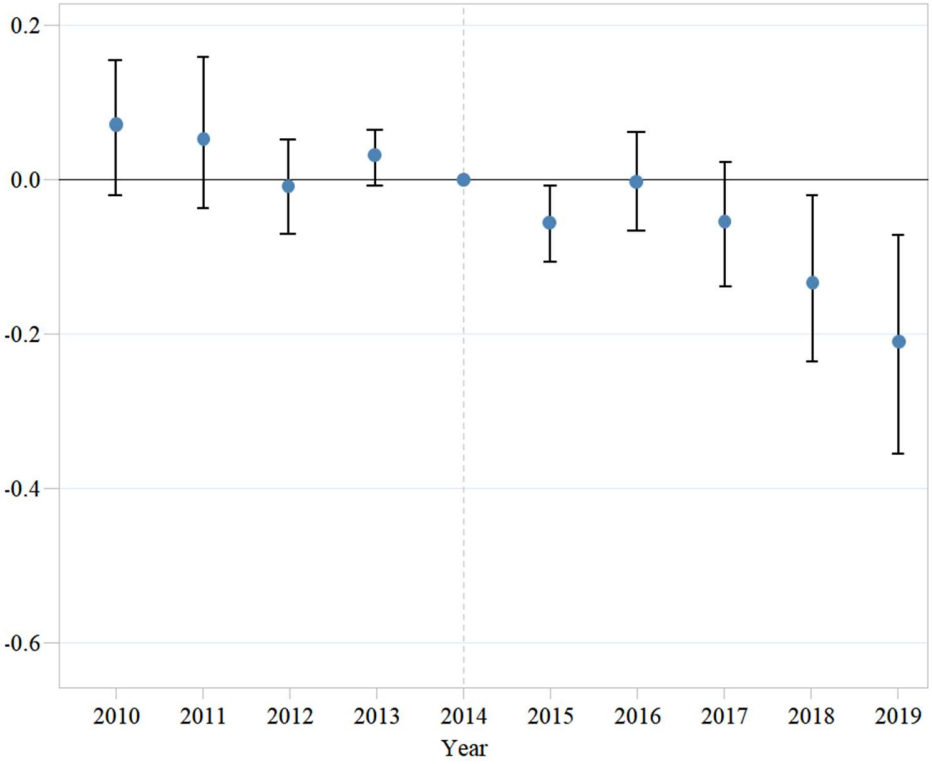
Figure 2
Coefficients on Year Dummy x Covered Country of Table 9

This figure presents coefficient estimates and 95% confidence intervals for OLS regressions estimating the effects of the post-CMD decrease in conflicts for each year (See Table 9). Panel A plots the coefficients of column 1 of Table 9. Panel B plots the coefficients of column 2 of Table 9. Panel C plots the coefficients of column 3 of Table 9. All variables are defined in Appendix I.

Panel A. Ln Conflicts



Panel B. Ln Violent



Panel C. Ln Non-Violent

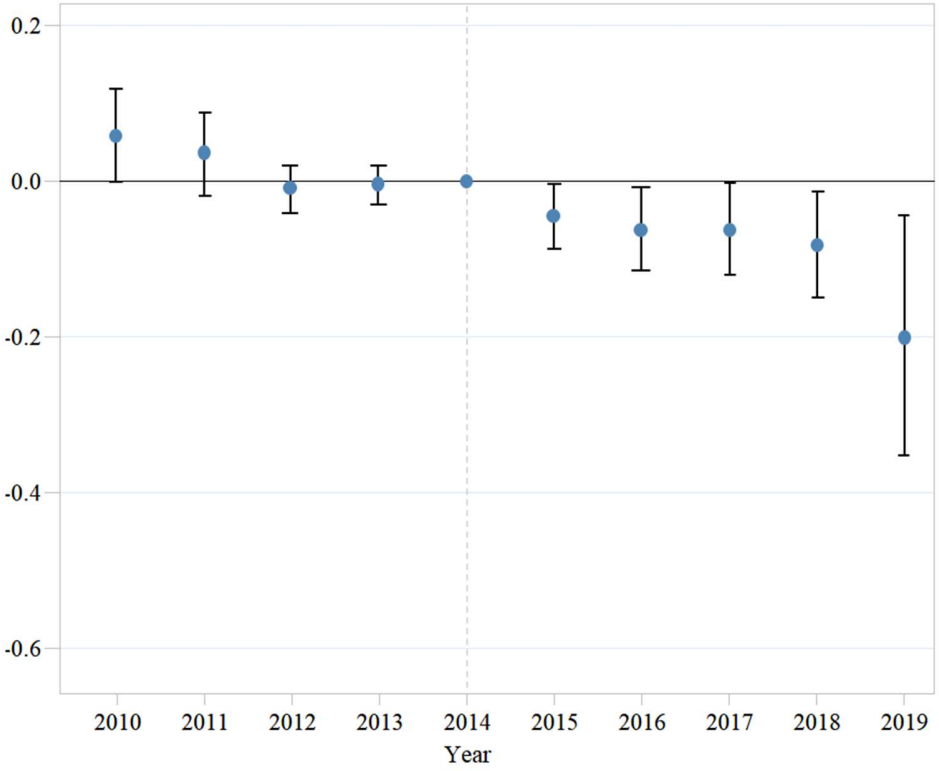


TABLE 1
Descriptive Statistics

Panel A provides summary statistics for the variables used in our hand-collected sample. Panel B provides the distribution of the *Responsible Sourcing* measures by year. All variables are defined in Appendix I. All continuous variables are winsorized at the 1st and 99th percentiles. The sample period for our *% of Conflict-Free Smelters/Refiners* measure is between 2014 and 2018, while the sample period for the *Dissociation* measure is between 2014 and 2016 based on data available from Developmental International.

PANEL A – Descriptive Statistics

Variable	*n*	Mean	S.D.	Q1	Median	Q3
% of Conflict-Free Smelters/Refiners	1,358	0.716	0.242	0.593	0.776	0.903
Public Attention	1,251	84.392	109.340	33.000	53.000	88.000
Dissociation	1,956	0.522	0.500	0.000	1.000	1.000
CAR	1,956	0.003	0.029	-0.010	0.002	0.016
Size	1,956	7.404	2.139	6.045	7.464	8.828
BTM	1,956	0.622	0.267	0.425	0.595	0.788
Free Cash Flow	1,956	0.049	0.123	0.032	0.069	0.105
ROA	1,956	0.090	0.143	0.066	0.113	0.156
Leverage	1,956	0.432	0.213	0.279	0.423	0.551
Cash	1,956	0.182	0.161	0.059	0.138	0.252
Sales	1,956	7.094	2.021	5.770	7.300	8.430
Total Assets	1,956	7.284	2.051	5.886	7.457	8.637

PANEL B – Responsible Sourcing by Year

Variable	*n*	Mean	S.D.	*n*	Mean	S.D.
Responsible Sourcing	*% of Conflict-Free Smelters/Refiners*			*Dissociation*		
2014	147	0.446	0.265	669	0.450	0.498
2015	252	0.637	0.255	656	0.477	0.500
2016	324	0.726	0.215	631	0.645	0.479
2017	319	0.792	0.186			
2018	316	0.819	0.172			
Total	1,358	0.716	0.242	1,956	0.522	0.500

TABLE 2
Public Attention and Responsible Sourcing

This table presents coefficient estimates from regressions of *Responsible Sourcing* variables on *Public Attention*. Column (1) reports the regression of *% of Conflict-Free Smelters/Refiners*, the ratio of the number of conflict-free smelters/refiners over the number of total smelters/refiners, on *Public Attention* with controls. Column (2) reports the probit regression of *Dissociation,* an indicator that a firm has already suspended or intends to suspend its purchases from problematic smelters and refiners, on *Public Attention* with controls. The variable of interest is *Public Attention,* the previous year's number of EDGAR downloads of a firm's specialized disclosure. All variables are defined in Appendix I. Standard errors are clustered at the industry level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variables	
	% of Conflict-Free Smelters/Refiners	*Dissociation*
	(1)	(2)
Independent Variables		
Public Attention	0.012**	0.045***
	2.35	3.34
Free Cash Flow	0.122	0.493
	1.78	0.85
ROA	-0.072	-0.498
	(-0.75)	(-1.15)
Cash	-0.038	-0.343
	(-0.30)	(-0.97)
Leverage	0.064**	-0.082
	2.67	(-0.52)
BTM	-0.01	-0.242***
	(-0.43)	(-2.78)
Sales	-0.012	0.143
	(-0.45)	1.26
Total Assets	-0.003	-0.062
	-0.18	(-0.62)
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Pseudo/Adjusted R^2	0.085	0.052
Observations	920	1,248

TABLE 3
Univariate Analysis of Conflict Minerals Disclosures by Dissociation

This table reports the means and differences-in-means of variables used in analysis, partitioned by whether there is evidence that a firm has already suspended or intends to suspend its purchases from problematic smelters using the dissociation dummy (*Dissociation*). Panel A (Panel B) provides our descriptive statistics across our unweighted sample variables (entropy-balanced weighted control variables) between firms classified as *Dissociation* = 1 and those classified as *Dissociation* = 0. All variables are defined in Appendix I. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

PANEL A: Univariate Analysis

	Dissociation = 0		*Dissociation* = 1		
	N = 935		*N = 1,021*		
Variable	Mean (1)	t-stat. (2)	Mean (3)	t-stat (4)	Difference (3) – (1)
CAR	0.001	1.49	0.004	5.17	0.003**
					(2.33)
Size	7.193	100.59	7.598	116.93	0.405***
					(4.20)
BTM	0.640	70.84	0.606	74.97	-0.033***
					(-2.77)
Leverage	0.432	60.51	0.432	66.58	0.000
					(0.04)

PANEL B: Univariate Analysis After Entropy Balancing

	Dissociation = 0		*Dissociation* = 1		
	N = 935		*N = 1,021*		
Variable	Mean (1)	t-stat (2)	Mean (3)	t-stat (4)	Difference (3) – (1)
Size	7.598	107.56	7.598	116.93	0.000
					(0.00)
BTM	0.618	70.47	0.606	74.97	-0.012
					(-1.01)
Leverage	0.432	62.39	0.432	66.58	0.000
					(0.00)

TABLE 4
Market Reactions to Conflict Minerals Disclosures

This table reports the regression results for the five-day market-adjusted cumulative abnormal return (*CAR*) on the *Responsible Sourcing* variables. Columns (1) and (3) report the regressions of *CAR* on the *Responsible Sourcing* variables without controls. Columns (2) and (4) report the regression results including the control variables. Columns (3) and (4) report the results for weighted ordinary least squares regressions where we both control for and entropy balance the mean, variance, and skewness between the two groups of all control variables. The sample period for our *% of Conflict-Free Smelters/Refiners* measure is 2014 through 2018, while the sample period for the *Dissociation* measure is 2014 through 2016 based on data from Developmental International. All variables are defined in Appendix I. Standard errors are clustered at the firm and year level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable = CAR			
	(1)	(2)	(3)	(4)
% of Conflict-Free Smelters/Refiners	0.007**	0.007**		
	(2.27)	(2.15)		
Dissociation			0.003**	0.003**
			(2.37)	(2.35)
Size		-0.001		-0.000
		(-1.03)		(-0.59)
BTM		-0.004		-0.001
		(-1.14)		(-0.34)
Leverage		0.004		0.004
		(0.94)		(1.21)
Adjusted R^2	0.003	0.003	0.002	0.002
Observations	1,340	1,340	1,956	1,956

TABLE 5

Mutual Fund Ownership Sensitivity to Conflict Minerals Disclosures

This table reports an analysis of the percentage change in mutual fund ownership following quarters with firms subject to the conflict minerals disclosure requirement that filed a specialized disclosure in the Post-CMD period. The sample period spans January 1, 2010 to December 31, 2019. *CM* is a binary indicator variable that takes the value of one if a firm is subject to the conflict minerals disclosure requirement. *CMD* is a binary indicator that takes the value of one if the *CM* is in the Post-CMD period. *SRI* is a binary indicator that takes the value of one if a mutual fund is identified as socially responsible. The mutual fund data are from Thomson Reuters' Mutual Funds database. SRI mutual fund data is from The Forum for Sustainable and Responsible Investment (USSIF) (we accessed this dataset in August 2021). Column (1) includes mutual fund, year-quarter, and year-quarter × SRI fixed effects. All variables are defined in Appendix I. Standard errors clustered at the mutual fund level. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable = % Change in Holdings	(1)
Mutual Fund Sensitivity to CMs Pre- and Post-CMD:	
CM	0.000
	(0.21)
CM × *CMD*	-0.019***
	(-8.90)
Incremental SRI-Fund Sensitivity to CMs Pre- and Post-CMD:	
SRI × *CM*	-0.038*
	(-1.86)
SRI × *CM* × *CMD*	0.039*
	(1.76)
Fixed Effects:	
Fund	Yes
Year-Quarter	Yes
Year-Quarter × SRI	Yes
Adjusted R^2	0.085
Observations (Fund-Firm, Year-Quarter)	45,505,988

TABLE 6
Sample Construction of Grid-Level Analysis

This table provides details on the construction of our final sample of mining region cells.

	Number of Observations
All 10,335 cells over a 10-year sample period between 2010 and 2019	103,350
Less:	
Cells that correspond to countries in which ACLED does not report conflicts	(110)
Cells with missing control variables	(13,462)
Cells that correspond to non-mining regions	(71,116)
Final sample	**18,662**

TABLE 7
Descriptive Statistics of Mining Regions

Panel A provides descriptive statistics of mining regions for the years 2010–2019. Panel B provides the pairwise Pearson (Spearman) correlations among variables of mining regions in the upper (lower) triangular region. Correlations that are statistically significant at the 5% level of significance are reported in bold. All variables are defined in Appendix I. All continuous variables are winsorized at the 1st and 99th percentiles.

PANEL A – Descriptive Statistics of Our Mining Regions Sample

Variable	Mean	S.D.	Min	Q1	Median	Q3	Max
Ln Conflicts	0.27	0.64	0	0	0	0	3.37
Ln Violent	0.18	0.48	0	0	0	0	3.05
Ln Non-Violent	0.13	0.41	0	0	0	0	2.30
GDP (billion USD)	107.50	138.14	0.85	13.45	29.31	161.21	568.50
GPD-per-capita (USD)	2949.84	2428.90	234.24	787.24	1743.85	5303.31	8279.60
Labor Force (mil. people)	12.93	11.40	0.32	5.61	10.94	20.36	58.40
Labor Participation Rate	63.08	12.65	41.15	53.05	62.73	74.68	86.65
Capital Investment (billion USD)	24.80	28.82	0	3.11	8.57	41.01	97.40
Male Unemployment Rate	10.28	7.45	0.39	4.76	8.11	14.67	26.39

PANEL B – Pairwise Correlations

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) *Ln Conflicts*		**0.91**	**0.86**	**0.08**	**-0.02**	**0.09**	**-0.02**	**0.06**	0.00
(2) *Ln Violent*	**0.88**		**0.61**	**0.08**	**-0.03**	**0.10**	**0.02**	**0.04**	-0.01
(3) *Ln Non-Violent*	**0.76**	**0.51**		**0.06**	**0.01**	**0.04**	**-0.06**	**0.05**	**0.02**
(4) *GDP*	**0.09**	**0.08**	**0.08**		**0.65**	**0.63**	**-0.47**	**0.92**	**0.63**
(5) *GDP-per-capita*	**-0.01**	**-0.03**	**0.03**	**0.56**		**0.05**	**-0.43**	**0.65**	**0.84**
(6) *Labor Force*	**0.09**	**0.10**	**0.05**	**0.78**	**0.01**		**-0.09**	**0.54**	**0.04**
(7) *Labor Participation Rate*	0.00	**0.03**	**-0.05**	**-0.39**	**-0.47**	**-0.11**		**-0.55**	**-0.47**
(8) *Capital Investment*	**0.04**	**0.03**	**0.05**	**0.93**	**0.57**	**0.71**	**-0.49**		**0.56**
(9) *Male Unemployment Rate*	**-0.05**	**-0.06**	-0.01	**0.43**	**0.81**	**-0.02**	**-0.59**	**0.45**	

TABLE 8

Conflicts in Mining Regions around Conflict Minerals Disclosures: DID Regression Analysis

This table reports the regression results of the differential changes in the number of conflicts pre- and post-Conflict Minerals Disclosure based on whether the country is covered under Section 1502 of the Dodd-Frank Act. The sample period spans from January 1, 2010 to December 31, 2019. The dependent variable, *Ln Conflicts (Ln Violent) {Ln Non-Violent},* is the natural log of (1 + the number of all (violent) {non-violent} conflicts) in cell *k* during year *t*. The variable of interest is *Post* × *Covered Country. Post* is an indicator variable equal to one for years after 2014. *Covered Country* is an indicator variable equal to one if the cell is within the Democratic Republic of Congo or an adjoining country. Columns (2), (4), and (6) include cell and year fixed effects. All variables are defined in Appendix I. Standard errors are clustered at the country level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Ln Conflicts		*Ln Violent*		*Ln Non-Violent*	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
Post	0.163***		0.100***		0.090***	
	(16.08)		(13.14)		(14.05)	
Covered Country	-0.079***		-0.037***		-0.061***	
	(-4.63)		(-2.93)		(-5.59)	
Post × *Covered Country*	-0.098***	-0.164***	-0.050***	-0.102***	-0.056***	-0.088***
	(-3.93)	(-5.59)	(-2.70)	(-3.70)	(-3.56)	(-4.52)
GDP		0.000		0.000		0.000
		(0.17)		(0.12)		(0.07)
GDP-per-capita		-0.000**		-0.000		-0.000*
		(-2.19)		(-1.07)		(-2.03)
Labor Force		0.009		0.016		0.000
		(0.73)		(1.55)		(0.03)
Labor Participation Rate		-0.017***		-0.009*		-0.010**
		(-2.96)		(-1.91)		(-2.67)
Capital Investment		0.007**		0.003		0.005***
		(2.09)		(1.24)		(3.07)
Male Unemployment Rate		-0.017*		-0.006		-0.010
		(-1.87)		(-0.94)		(-1.62)
Cell Fixed Effects	No	Yes	No	Yes	No	Yes

Year Fixed Effects	No	Yes	No	Yes	No	Yes
Adjusted R^2	0.019	0.609	0.012	0.523	0.017	0.567
Observations	18,662	18,662	18,662	18,662	18,662	18,662

TABLE 9
Spillover Tests

This table reports whether there are spillovers of different conflict types into non-mining regions. The sample period spans January 1, 2010 to December 31, 2019. The dependent variable, *Ln Conflicts,* is the natural log of (1 + the number of conflicts) in cell *k* during year *t*. The dependent variable, *Ln Violent (Ln Non-Violent),* is the natural log of (1 + the number of violent (non-violent) conflicts) in cell *k* during year *t*. The variable of interest is *Post* × *Covered Country. Post* is an indicator variable equal to one for years after 2014. *Covered Country* is an indicator variable equal to one if the cell is within the Democratic Republic of Congo or an adjoining country. All variables are defined in Appendix I. Standard errors are clustered at the country level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Non-Mining Regions		
	Ln Conflicts	*Ln Violent*	*Ln Non-Violent*
Independent Variables	(1)	(2)	(3)
Post × *Covered Country*	-0.043	-0.021	-0.016
	(-1.34)	(-0.82)	(-0.76)
GDP	0.001**	0.001***	0.000
	(2.25)	(2.77)	(1.34)
GDP-per-capita	0.000	0.000	-0.000
	(0.40)	(0.93)	(-1.25)
Labor Force	0.015**	0.010	0.011***
	(2.52)	(1.60)	(3.76)
Labor Participation Rate	-0.013	-0.010	-0.004
	(-0.96)	(-0.95)	(-0.72)
Capital Investment	-0.003*	-0.003*	-0.000
	(-1.68)	(-1.99)	(-0.69)
Male Unemployment Rate	0.007	0.008	0.003
	(0.52)	(0.66)	(0.61)
Cell Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Adjusted R^2	0.680	0.633	0.622
Observations	71,116	71,116	71,116

TABLE 10
The Role of Political Institutions

This table reports whether institutional quality plays a role in the relation between conflict mineral disclosures and different conflict types in the covered countries. The sample period spans January 1, 2010 to December 31, 2019. The dependent variable, Ln Conflicts, is the natural log of (1 + the number of conflicts) in cell k during year t. The dependent variable, Ln Violent (Ln Non-Violent), is the natural log of (1 + the number of violent (non-violent) conflicts) in cell k during year t. The variable of interest is Post × $Covered\ Country_{Strong}$ ($Covered\ Country_{Weak}$). Post is an indicator variable equal to one for years after 2014. $Covered\ Country_{Strong}$ ($Covered\ Country_{Weak}$) is an indicator variable equal to one if the cell is within a covered country that is a Democracy (Non-Democracy) and zero otherwise. All variables are defined in Appendix I. Standard errors are clustered at the country level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Mining Regions		
	Ln Conflicts	*Ln Violent*	*Ln Non-Violent*
Independent Variables	(1)	(2)	(3)
$Covered\ Country_{Strong}$	0.356***	0.163*	0.243***
	(3.58)	(2.01)	(3.84)
$Post \times Covered\ Country_{Strong}$	-0.070**	-0.030	-0.050**
	(-2.18)	(-1.20)	(-2.58)
$Covered\ Country_{Weak}$	1.938***	1.325***	1.430***
	(3.79)	(3.41)	(3.35)
$Post \times Covered\ Country_{Weak}$	-0.139***	-0.087***	-0.070***
	(-4.27)	(-3.90)	(-3.20)
GDP	-0.000	-0.000	-0.000
	(-0.34)	(-0.35)	(-0.23)
GDP-per-capita	-0.000**	-0.000	-0.000**
	(-2.23)	(-1.09)	(-2.14)
Labor Force	0.001	0.010	-0.004
	(0.04)	(0.85)	(-0.43)
Labor Participation Rate	-0.018***	-0.010**	-0.011**
	(-2.93)	(-2.06)	(-2.69)
Capital Investment	0.007**	0.004	0.005***
	(2.34)	(1.45)	(3.42)
Male Unemployment Rate	-0.016*	-0.006	-0.009
	(-1.77)	(-1.01)	(-1.40)
F-test for difference [p-value]: $Post \times Covered\ Country_{Strong} + Post \times Covered\ Country_{Weak}$	[0.024]	[0.007]	[0.230]
Cell Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Adjusted R^2	0.660	0.581	0.621
Observations	22,335	22,335	22,335

TABLE 11
Time-Period Indicator Tests

This table checks for the parallel trend assumption using time-period indicator variables. The sample period spans from January 1, 2010 to December 31, 2019. The dependent variable, *Ln Conflicts*, is the natural log of (1 + the number of conflicts) in cell *k* during year *t*. The dependent variable, *Ln Violent* (*Ln Non-Violent*), is the natural log of (1 + the number of violent (non-violent) conflicts) in cell *k* during year *t*. *Covered Country* is an indicator variable equal to one if the cell is within the Democratic Republic of Congo or an adjoining country. *Year* is a set of indicator variables for each year in our sample period. We estimate the model from Table 7 but replace the indicator variable *Post* × *Covered Country* with separate interactions for each of the years in our sample (except for 2014, which serves as the benchmark). All variables are defined in Appendix I. Standard errors are clustered at the country level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Ln Conflicts	*Ln Violent*	*Ln Non-Violent*
Independent Variables	(1)	(2)	(3)
Year 2010 ×	0.094*	0.057	0.040
Covered Country	(1.91)	(1.34)	(1.50)
Year 2011 ×	0.063	0.050	0.018
Covered Country	(1.14)	(1.04)	(0.67)
Year 2012 ×	-0.027	-0.013	-0.024
Covered Country	(-0.66)	(-0.41)	(-1.33)
Year 2013 ×	0.010	0.026	-0.017
Covered Country	(0.56)	(1.30)	(-1.27)
Year 2014 × *Covered Country*	Dropped	Dropped	Dropped
Year 2015 ×	-0.100***	-0.062**	-0.057**
Covered Country	(-2.96)	(-2.47)	(-2.52)
Year 2016 ×	-0.059	-0.006	-0.072***
Covered Country	(-1.28)	(-0.16)	(-2.77)
Year 2017 ×	-0.099*	-0.056	-0.068**
Covered Country	(-2.01)	(-1.37)	(-2.32)
Year 2018 ×	-0.194***	-0.139**	-0.092***
Covered Country	(-3.13)	(-2.59)	(-3.00)
Year 2019 ×	-0.374***	-0.218***	-0.202***
Covered Country	(-4.58)	(-3.19)	(-2.94)
Controls	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Adjusted R^2	0.611	0.524	0.568
Observations	18,662	18,662	18,662

TABLE 12
Group Time Trends

This table reports the robustness checks of controlling for group-specific linear time trends. The sample period spans from January 1, 2010 to December 31, 2019. The dependent variable, *Ln Conflicts*, is the natural log of (1 + the number of conflicts) in cell *k* during year *t*. The dependent variable, *Ln Violent* (*Ln Non-Violent*), is the natural log of (1 + the number of violent (non-violent) conflicts) in cell *k* during year *t*. The variable of interest is *Post* × *Covered Country. Post* is an indicator variable equal to one for years after 2014. *Covered Country* is an indicator variable equal to one if the cell is within the Democratic Republic of Congo or its adjoining countries, as defined by the Act. All variables are defined in Appendix I. Standard errors are clustered at the country level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Ln Conflicts	*Ln Violent*	*Ln Non-Violent*
Independent Variables	(1)	(2)	(3)
Post	-0.011	0.009	-0.022
	(-0.40)	(0.56)	(-1.01)
Post × *Covered Country*	-0.168***	-0.104***	-0.090***
	(-5.45)	(-3.64)	(-4.62)
Time Trends	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	No	No	No
Adjusted R^2	0.606	0.522	0.564
Observations	18,662	18,662	18,662

TABLE 13
Placebo Tests

This table reports our placebo test results. The sample period spans from January 1, 2010 to December 31, 2014. The dependent variable, *Ln Conflicts*, is the natural log of (1 + the number of conflicts) in cell *k* during year *t*. The dependent variable, *Ln Violent* (*Ln Non-Violent*), is the natural log of (1 + the number of violent (non-violent) conflicts) in cell *k* during year *t*. The variable of interest is *Post* × *Covered Country*. *Covered Country* is an indicator variable equal to one if the cell is within the Democratic Republic of Congo or an adjoining country. *Post* is an indicator variable equal to one (zero) for years 2013 and 2014 (2010 and 2011). Observations related to year 2012 are dropped. All variables are defined in Appendix I. Standard errors are clustered at the country level. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Ln Conflicts	*Ln Violent*	*Ln Non-Violent*
Independent Variables			
	(1)	(2)	(3)
Post × *Covered Country*	0.061	0.061	0.022
	(0.91)	(1.13)	(0.58)
Controls	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Adjusted R^2	0.614	0.518	0.569
Observations	7,672	7,672	7,672