

**When it's the Slaves that Pay:
In Search of a Fair Due Diligence Cost Distribution in Conflict Mineral
Supply Chains**

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Abstract

Modern slavery and conflict minerals are often treated as two separate grand challenges governed by different legislation, yet conflict mineral settings commonly involve and inflict slavery in supply chains – hence these two wicked problems are deeply interconnected. This paper focuses on due diligence in the context of conflict mineral supply chains, and in doing so provides important insights for modern slavery in general. Using more than 38 hours of recordings from exploratory interviews with 46 experts from 43 organizations, our study investigates: a) how due diligence costs and benefits are actually distributed in supply chains in practice; and b) the means through which due diligence costs and benefits can be (more appropriately) shared. We find that there is a lack of contextualization of cost-sharing mechanisms to conflict mineral supply chains, with most mechanisms being imported from the standard business literature where the producer must pay the production costs before reaping the benefits that offset these costs. But in conflict mineral supply chains, these benefits often do not materialize for the producer and, consequently, cost-sharing mechanisms lead to unintended consequences. The findings question the usefulness of due diligence, call for alternative financing mechanisms, and for contextualized solutions designed from the bottom up. This in turn has important implications for enhancing legislation on modern slavery.

Keywords: *Modern Slavery; Supply Chain Due Diligence; Conflict Minerals; Cost Sharing; Corporate Social Responsibility; Unintended Consequences.*

1. Introduction

Although there is some debate on how modern slavery should be defined (Caruana et al. 2021), authors generally agree that it can take various forms, including forced labor, human trafficking and debt bondage (Feasley 2016). It encapsulates various types of human exploitation, including humiliation, inhumane working conditions, and the violation of employment and human rights (Paz-Fuchs 2016; Voss et al. 2019). From a supply chain perspective, modern slavery is broadly concerned with exploiting individuals who lose their freedom at any stage along the supply chain, from raw material extraction right through to the final consumer (Gold et al. 2015). While there is now a substantial literature on socially sustainable supply chain management (Koberg and Longoni 2019), it has long been argued that modern slavery is a particularly acute social problem that demands specific attention in its own right (e.g. New 2015). Yet, the hidden,

criminal nature of the threat means that conducting research in this sphere is challenging (Stringer and Simmons 2015). Studies rarely gain access to actors or individuals close to or directly affected by modern slavery, particularly in the upper tiers of supply chains (LeBaron and Crane 2019). Instead, the focus in the literature is typically on the Western focal buying firm's perspective (Fridell 2022), particularly on how it detects and responds to modern slavery risks or to legislation. This research is frequently based on a secondary data analysis of either modern slavery reporting statements or the financial effects of disclosure (e.g. Stevenson and Cole 2018; Flynn 2019; Cousins et al. 2020; Meehan and Pinnington 2021). While there are exceptions (e.g. Benstead et al. 2018), there is still a need for more primary research, particularly on the upstream end of supply chains and in emerging economy or developing country contexts (e.g. Govindan et al. 2021). While modern slavery can occur anywhere along the supply chain (Stevenson 2022), the risk is considered particularly high in these upper, less visible echelons of supply chains.

While modern slavery is a crime in itself, forced labor practices in particular have also been associated with other forms of illicit behavior, particularly in the mining industry, including the mining of conflict minerals (Crane 2013; Martin-Ortega et al. 2015). Bringing a raw mineral to the consumer market involves multiple actors, and includes mining and exploration, processing (i.e. refining and smelting), manufacturing (i.e. fabrication), retail, and trading (van den Brink et al. 2019). It is specifically the upstream supply chain that is prone to modern slavery. These steps, from the mine to the refineries, includes intermediaries such as local traders, exporters from the country of origin, transporters, and international traders (OECD 2016). Tin, tungsten, tantalum, and gold, often referred to as the "3TGs" (Kim and Davies 2016), are conflict minerals, yet many other resources, such as copper, cobalt or specific rare earth minerals are considered to be of the same status (Sovacool 2021). The systematic exploitation of and trade in these resources in the context of conflict-affected and high-risk areas (CAHRA) has been used to finance armed groups, fuel forced labor and other human rights abuses, and support both corruption and money laundering (European Commission 2020). Conflict minerals generate significant resources and income for armed groups that suppress and enslave not only miners but also entire regions for their own benefit (Gold et al. 2015; Hofmann et al. 2018) – hence, it is enabled by practices that form part of modern slavery definitions (e.g. Gold et al. 2015; Caruana et al. 2021; Simpson et al. 2021). The 3TGs, plus cobalt, copper and others are highly sought-after materials that are found not only in jewelry but also in many everyday products in the form of processed components (Hofmann et al. 2018). For instance, tantalum is extracted from coltan and used to make tantalum capacitors, which are found in mobile phones, automobiles, and computers. Copper and tantalum are needed for batteries, which are pivotal to transition to a decarbonized and circular economy, and consequently are a key part of mitigating climate change (Sovacool et al. 2020). Approximately 64% of cobalt in 2018 and 40% of coltan in 2019 was sourced from the Democratic

Republic of Congo, where the extraction of minerals has been linked to various forms of slavery (Sovacool 2021; The Economist 2021).

Despite the close connection between modern slavery and conflict minerals, until now the two issues have been largely treated separately in the literature (Gold et al. 2015). One reason for this is that they are governed by different legislation. This is important since the US Dodd-Frank Act 2010 (Section 1502) (hereafter referred to as DFA), which governs conflict minerals, involves different duties for firms than is encouraged by legislation for modern slavery, e.g. the California Transparency in Supply Chains Act or the UK Modern Slavery Act. Whereas the UK Modern Slavery Act relies on company statements and *voluntary* disclosure, according to the DFA, companies *must* exercise due diligence on the source and chain of custody of their conflict minerals. The reporting duty contained in the DFA reaches into the supply chain as it is concerned with the point of origin from which the minerals are sourced (LeBaron and Rühmkorf 2017).

Legislation aimed at addressing modern slavery is frequently criticized for a lack of enforcement (Monciardini et al. 2021); hence, the stricter legislation specifically aimed at conflict minerals and due diligence could provide important implications for modern slavery legislation. That is, investigating specifically the context of conflict minerals and due diligence allows us to assess the effectiveness of enforced due diligence, which could have implications for modern slavery where due diligence could potentially be enforced in the future. Hence, this provides important policy guidance on how to bring about the greatest benefit to people on the ground. It is well-documented that focal firms are under increasing pressure to maintain due diligence over their supply chains, as they are being held responsible for the actions of their supply chain members (Hartmann and Moeller 2014; Hofmann et al. 2018; Smit et al. 2020; Shi et al. 2021). Regulations and stakeholders push these firms towards taking on a state-like governance role (Heidingsfelder 2019), whether this be in the context of conflict minerals with its associated human rights implications or in the context of modern slavery (Caruana et al. 2021).

While taking on this expanded political corporate social responsibility (CSR) role allows firms to better manage their reputational risks and legal liabilities (Drobetz et al. 2014; Chan et al. 2020) and may bring about benefits for the supply chain as a whole (Hofmann et al. 2014; Hajmohammad and Vachon 2016), it is resource-intensive (Fasterling and Demuijnck 2013) and incurs significant costs (Bayer 2014; Blome et al. 2016). In terms of these costs, scholars and ethicists have argued that firms have a moral obligation to uphold human rights and that “meeting human rights duties is to be understood as a necessary cost of doing business” (Arnold 2010, p. 384; Cragg 2012), even if there are no obvious or immediate benefits. But this is not what frequently occurs in practice, especially since prior research suggests that costs and benefits are not equally and/or “fairly” shared in global supply chains (Clarke and Boersma 2017; Dindial et al. 2020; Caspersz et al. 2022). In response, this study uses exploratory interviews in the context of conflict minerals

to assess how due diligence costs and benefits are currently shared, and the means through which they can be more appropriately shared.

The remainder of this study is structured as follows. Section 2 provides the backdrop to our study before the research method is outlined in Section 3. Results from our exploratory interviews are presented in Section 4. A discussion is then presented in Section 5, including suggestions on how to realize a fairer share of due diligence costs. This includes an outline of major obstacles and important avenues for future research. Finally, the paper concludes in Section 6.

2. Background

2.1 Extended Responsibility in Supply Chains

The concept of CSR has traditionally been understood as referring to “taking actions that appear to further some social good, beyond the interests of the firm and that which is required by law” (McWilliams and Siegel 2001, p. 117). Yet, over recent decades and amidst the groundswell of academic literature on sustainable supply chain management (cp. Touboulic and Walker 2015), CSR has been incrementally transcended by stakeholders and regulators towards a greater degree of firm responsibility for wrongdoings that traditionally did not fall within their direct sphere of influence (Amaeshi et al. 2008; Kumar et al. 2021; Smit et al. 2021). Indeed, social and environmental issues have become part of “regulation outsourcing”, a phenomenon that describes the emergence of new non-governmental regulatory structures, usually built on strong collaboration with Non-Governmental Organizations (NGOs) and other third parties in the context of standards-setting and monitoring (cp. O’Rourke 2003, Sarfaty 2015), which has resulted in new concepts such as “political CSR” (Matten and Crane 2005; Scherer and Palazzo 2007; 2011).

Political CSR has gained attention following the seminal work of Matten and Crane (2005) and Scherer and Palazzo (2007; 2011), and the political CSR literature has been expanding ever since (e.g. Whelan 2012; Rotter et al. 2014; Reinecke and Ansari 2016). In essence, political CSR differs from traditional CSR in its desire to transcend not only the initial role of businesses – i.e. to go beyond profit maximization by delivering social good – but also to fill in the void created by the erosion of international and national regulations that has resulted from globalization (Scherer and Palazzo 2007). As such, some companies, particularly internationally-significant actors with global supply chains, have begun to take on state-like roles – making up for failed states and the lack of supra- and international regulatory frameworks (Matten and Crane 2005) – by tackling “wicked problems” and “grand challenges”, including modern slavery and conflict minerals (George et al. 2016; Reinecke and Ansari 2016). Consequently, focal firms are increasingly required to be aware of the provenance of their materials and to track and manage the sources of social conflicts in their supply chains, particularly at the upstream end (Swift et al. 2019).

In the context of conflict minerals, several small-scale regulatory attempts to contain the most severe repercussions of trade in conflict minerals were followed by an enormous push towards establishing a higher degree of accountability amongst downstream firms in developed countries through NGO activism (Reinecke and Ansari 2016) and larger regulative norms. This began with the DFA followed by the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from CAHRAs (hereafter referred to as OECD Guidance) in 2011. Although different in their approaches to conflict mineral management, DFA and OECD Guidance have increased companies' awareness of the consequences of conflict minerals for their reputational risk exposure and legal liability. For example, Section 1502 of the DFA stipulates that U.S.-listed firms must disclose whether they use conflict minerals and whether they originate in the Democratic Republic of the Congo, or an adjoining country. In the most recent regulative development, the European Union passed a regulation "*laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas*" (EU 2017/821 2017), which took effect in 2021.

2.2 The Role of Due Diligence

Responding to regulation like the OECD Guidance, the EU regulation, and other measures aimed at addressing trade in conflict minerals is reliant on due diligence. Due diligence is a continuous, holistic, proactive and reactive process through which companies can ensure that they respect human rights and protect the environment (Ruggie 2008; OECD 2016). Accordingly, it can be applied not only in the context of conflict minerals but also in the context of, for example, responding to modern slavery legislation or deforestation detection and prevention (Christ and Burritt 2021; OECD 2021). Indeed, shortly after the DFA, the California Transparency in Supply Chains Act was introduced in 2012, requiring firms doing business in California to publicly disclose their efforts to eliminate modern slavery and human trafficking from their supply chains. This was followed by the 2015 Modern Slavery Act in the UK, which was designed to create more transparency by requiring firms with an annual turnover of £36 million or greater that do business in the UK to develop and publish an annual modern slavery act statement outlining the steps they take to address human trafficking and modern slavery in their supply chains. Similar legislation has since been introduced in a number of other countries, such as Australia, The Netherlands, Germany, and France (Smit et al. 2020).

The OECD provides five steps for implementing risk-based due diligence in order to prevent or mitigate negative repercussions in connection with firms' operations, procurement decisions, products and services and their business relationships (UN 2011): (1) establishing strong company management systems; (2) identifying and assessing risk in the supply chain; (3) designing and implementing a strategy to respond to

identified risks; (4) carrying out independent third-party audits of supply chain due diligence at identified points in the supply chain; and, (5) reporting on supply chain due diligence (OECD 2016).

2.3 The Cost of Due Diligence

Although due diligence in global supply chains has its merits, and more and more companies are adopting it (Hofmann et al. 2018; Smit et al. 2021), due diligence processes are often burdensome (Fasterling and Demuijnck 2013) and the steps involved do not come without significant costs. For instance, Bayer (2014) found that firms spend an average of half a million USD and six million staff hours in total to prepare conflict mineral reports. Further, Blome et al. (2016) found that downstream companies pay an average of approximately 270,000 EUR as an initial investment cost towards due diligence in the first year, which can then go as high as 535,000 EUR for recurring annual cost expenditures. While these figures should be taken cautiously, it is inarguably a matter of a firm's and supply chain's risk exposure as to how costly due diligence processes prove themselves to be. It is clear that gathering information and managing it, as well as fostering traceability and transparency through different evaluations and sources, such as internal data as well as external stakeholders, are resource-intensive measures (Fasterling and Demuijnck 2013).

Scholars and ethicists have argued that firms have a moral obligation to uphold human rights and that “meeting human rights duties is to be understood as a necessary cost of doing business” (Arnold 2010, p. 384; Cragg 2012). However, it remains opaque how the costs and potential benefits of ensuring due diligence and human rights protection are actually distributed across supply chains, and whether it is really the focal firm that takes the largest share of the costs (Postma et al. 2021). For example, prior research has emphasized that power imbalances in global value chains severely affect the way costs and benefits are distributed, which might even lead to a reinforcement of modern slavery practices (Anner et al. 2013; Clarke and Boersma 2017; Dindial et al. 2020; Caspersz et al. 2022; LeBaron and Lister 2022). Our first research question (RQ1) therefore asks:

RQ1: How are due diligence costs and benefits actually distributed in practice?

By answering this research question, we seek to shed light on potential unintended consequences, which are caused by conflicting stakeholder interests, for those very people these regimes claim to protect (Koch and Kinsbergen 2018; Matos et al. 2020, Caspersz et al. 2022; The Economist 2021). Prior research emphasizes that solutions in global supply chains have only been myopically studied, in mostly technocratic ways “with narrow measures of effectiveness, [while] the full costs of supply chain solutions – to the public good, to workers and to the planet – tend to be hidden and obscured” (LeBaron and Lister 2022, p. 674). Accordingly, our study sheds light on whether due diligence really improves working conditions or if there

are other priorities or tensions that hinder and corrupt the realization of legislation like the DFA (Koch and Kinsbergen 2018; Stoop et al. 2018). Meanwhile, previous research has called for more collective efforts to reduce the cost of investigating supply chains (Kim and Davies 2016). This study contributes to this effort by investigating potential due diligence cost-sharing mechanisms. Our second research question (RQ2) therefore asks:

RQ2: Through which means can (and should) due diligence costs and benefits be appropriately shared?

By exploring this second question, we provide examples of supply chains configurations that aim to generate regimes in which the costs and benefits of due diligence are equally distributed. These cost-sharing mechanisms are a major concern in transitions towards sustainability in general (Bogdanov et al. 2021), but also in the adoption of sustainable supply chain practices (e.g. Govindan et al. 2021). The vehicle used in our study to answer both questions will be exploratory interviews with organizations and people on the ground, as will be described next.

3. Methodology

3.1 Research Approach

Figure 1 provides a simple depiction of mineral supply chains and associated sustainability risks. This study focusses on the sharing of due diligence costs and benefits across this supply chain. Cost sharing in this kind of multi-tier supply chains is a rather complex phenomenon (Denk et al. 2012; Bansal et al. 2018), which integrates different direct and indirect stakeholders. This complexity is further aggravated in the context of grand challenges and, to the best of our knowledge, cost-sharing mechanisms have hardly been empirically studied in the wider sustainable supply chain and modern slavery literature. Due to these attributes of novelty, complexity, and the need for different knowledgeable stakeholder perspectives, a qualitative research approach is deemed as most suitable (Eisenhardt 1989; Yin 2014; Carter et al. 2015). Our study therefore relies on exploratory data analysis in order to discover, explore and empirically detect phenomena related to cost-sharing in the context of conflict minerals and modern slavery. It provides a first abductive step grounding future theory building and testing research.

[Take in Figure 1 approximately here]

Although multiple case studies dominate exploratory data analysis in our field (Barratt et al. 2011), often following the standards of Eisenhardt et al. (1989), we decided to gather data from knowledgeable interview partners across supply chains in order to increase the likelihood that all relevant cost-sharing mechanisms are captured through our data collection. Our design is therefore more in line with the Gioia method (e.g.

Gioia et al. 2013), where we consider conflict mineral supply chains as a case and try to capture diverse empirical evidence across industry sectors and different supply chain tiers. Our method follows the guidelines given in Corley and Gioia (2004), while it adopts interpretative approaches in order to analyze the observed variance in our data (Gehman et al. 2018).

3.2 Sampling and Data Collection

Based on NGO reports and discussions with representatives from an intergovernmental body, we identified industries with a high probability of sourcing conflict minerals (e.g. automotive, electronics, jewelry, aerospace and manufacturing). Next, we identified firms along these supply chains (e.g. focal firms, suppliers, smelters, mines), including further intermediaries (e.g. trading platforms, technology providers) and third parties (e.g. government agencies and NGOs). Although we did not have a theoretically predefined list of possible interview partners (Corbin and Strauss 2015), we identified an initial list of 116 firms based on conference attendance, industry and company reports, as well as third party advice. As the aim of this study is to gather diverse views on cost-sharing mechanisms in conflict mineral supply chains, we did not solely rely on supply chain managers, but rather sought to identify the most knowledgeable interview partner per organization. In some cases, this was the CEO (e.g. in smelters and smaller entities), while other firms had dedicated conflict mineral teams (e.g. focal firms). Meanwhile, procurement managers (e.g. focal firms, suppliers), sustainability officers, or auditors were identified in other cases.

Our final sample comprises interviews from 46 interviewees from 43 organizations that were collected between 2018 and 2019. A table with the complete list is given in the e-companion. All interviews were recorded, apart from 3 interviews for which we only were allowed to take notes due to firm protocols. The total duration of interviews was 38 hours, resulting in more than 250 pages of interview transcriptions. Two authors conducted the interviews via Skype, telephone and in person, first jointly to establish a similar protocol and harmonize the interviewing technique, and then separately. The interviews were based on a semi-structured interview guide, yet sufficient scope was provided to follow the exploratory nature of the research. For instance, the interview protocol was adapted throughout the process as different cost-sharing mechanisms emerged that informed later interviews (Yin 2014). This approach enabled us to further develop the concepts that emerged from the data (Gioia et al. 2013).

3.3 Analysis and Coding

As per the Gioia method, we moved constantly between data collection and data analysis, attempting to identify new relevant phenomena and distinguish different cost-sharing mechanisms by comparing similarities and differences (Gioia et al. 2013). Instead of pursuing more complex hierarchical data

structures through software, we pursued a simplified version of the Gioia method by coding our interviews in Word and Excel documents. As the aim was not to link different concepts, but to identify and uncover different phenomena, we deemed this simpler approach to data analysis to be more effective. The two interviewers of the study were accompanied in this process by two further researchers in order to have sufficient independent interpretation of the collected data. To ensure reliability, the data were frequently presented to different stakeholders, interviewees and at an international, intergovernmental conference in 2019. In total, we identified 8 different types of cost-sharing mechanism (i.e. supplier development, supplier empowerment, premiums, safeguarding the market and certifications, contracts, levy schemes, government, and blockchain and information).

4. Results

Our first research question was concerned with the distribution of due diligence costs, i.e. who is actually paying for the costs of due diligence. The majority of interviews highlighted that it is the upstream side of the supply chain that is currently paying the costs of supply chain due diligence; for example, “*everything has to be paid by the smelters*” [FIR2], “*all the cost goes to the [...] artisanal miners*” [Executive Director, MSI11], and “*this is a pre-requisite to the producer. If they do not bear the cost, and they have to 100%, they are out of the game*” [TA3].

This is partly due to a lack of power: “*I think the companies, the larger companies that negotiate with the ITSCI [International Tin Supply Chain Initiative] or BSP [Better Sourcing Program] they [...] can negotiate and get better deals, but the artisans, the small-scale miners don't have that choice*” [GOV1]. Larger players can also choose from a large set of different auditing firms to control their direct costs. In contrast, “*the mines must pay [...] for the audit themselves, but they of course have this limited list of auditors to choose from*” [MSI3]. In fact, costs may even increase disproportionately when moving upstream in the supply chain: “*If I take now the case of tungsten, okay? Which is one of the mines which has 800 miners, who are all independent [...] what they call 'independent miners' [interviewee laughs]. Sorry for the small laugh, but this is how they call it. The compliance cost on export value at that time was 5.5%. Okay? But the net price going to the miners was 55% of the value. So, this 5.5% becomes 10% at the stage of the miners. In fact, those compliant costs are pushed back to miners*” [Non-executive board member, MSI11].

From the interviews we can see that several key issues emerge: 1) due diligence costs are proportionally higher further up the supply chain; and, 2) due diligence costs are not aligned with due diligence benefits. The latter is further highlighted in the following statement by FIR11: “[...] *We've never minded paying, I must say in my response to you, we don't mind paying, we just mind paying it all; and other people taking the benefits. That's what we mind.*” Hence, how to share due diligence costs fairly across the supply chain

remains a pertinent challenge. This is also further complicated by the fact that focal firms (e.g. FIR15) argued that the “fair” allocation of costs is regulated by the current market system and therefore each party should pay for the due diligence costs that each firm directly encounters, but not the costs that were incurred at different stages of the supply chain as they were costed into the sales price. The argument of fierce competition on the end customer market is routinely brought forward as an argument for why the costs cannot be shared across the different tiers of the supply chain.

Our second research question was concerned with identifying which means that can (and should) be used to share out the costs of due diligence. The remainder of this section assesses different mechanisms of sharing due diligence costs based on the insights provided by the interviewees. Table 1 details the identified approaches together with the number of interviewees referring to each approach.

[Take in Table 1 approximately here]

4.1 Supplier Development

Supplier development plays an important role for sustainability and due diligence at all levels (Busse et al. 2016; Fan et al., 2021). Most suppliers have no prior knowledge of how to create the due diligence information needed to meet legislative demands, or as FIR2 put it: “*They are not experts at due diligence, right? They are experts at finding the raw material that they need [...]*”. At the same time, providing outside knowledge is no solution since “*you can’t fly somebody in who doesn’t speak the language, doesn’t know the culture, and assess for human rights, right?*” [FIR2]. Firms need to pay for training and due diligence but expect to be compensated through the local firm’s anticipated increased productivity. However, due diligence itself is unlikely to have any direct impact on productivity, although this was one of the hopes shared by NGOs (e.g. NGO3). It is not widely confirmed by firms on the ground (e.g. FIR11). Consequently, instead of providing a means to distribute costs, supplier development creates, in the case of conflict minerals, extra costs because due diligence is often driven by auditing and reporting. This extra cost is typically recovered from the supplier.

In cases when there is funding to support training, it needs to be mediated by local partners: : “[...] *The money also goes into engaging some of the local partners, because we can’t do it on our own, for example we engage some of the local NGOs or some local partners who do direct training [...] we do have a fund to support smaller producers*” [MSI2] and “[...] *it’s important that we work with local partners for training, like understand cultural, linguistic, dynamics, etc., [...] they’re usual local civil society groups that are kind of monitoring but maybe also helping implement stuff*” [INGO3]. In general, NGOs are critical when designing and setting up supplier development programs to ensure that they meet the needs of the supply-market reality (Rodríguez et al. 2016): “*We kind of shifted from the social program*

piece, to the kind of operations, helping them to set up quarries locally that could be staffed by local artisan miners to deliver gravel and stone that was needed to build the actual infrastructure around the mine.[...] So we worked, then, let's say in a more in-depth way with the companies [...] towards the business side” [NGO8]. In some cases, audit costs for the suppliers are paid from government resources in order to not put the financial burden of auditing on the upstream supplier (e.g. GOV2); however, due to different audit standards, these costs are often only a fraction.

4.2 Supplier Empowerment

Closely linked to supplier development is the empowerment of suppliers. Supplier empowerment broadly strives to adjust power imbalances between focal firms and artisanal miners, for instance through organizing the miners such that they become legal entities that can then benefit from increased legal certainty. Supplier empowerment and balancing power in relationships between local actors and focal firms can facilitate a fairer share of the costs and benefits in supply chains. For example, “[...] *I think it was a sum of eight million dollars that they [the Colombian government] are using to create empowering artisanal miners and responsible sourcing and I know also a movement to have, have a mining registry, where people are, the communities, the individuals, are registered as miners so they don't have to go through the illegal channels”* [MSI10]. As emphasized by MSI12: “[We are] *trying to bring a new element in terms of empowerment of people, both the miners and people who look into the tailings – women children – and trying to establish a minimum, an environment with a minimum of requirements of let's say human dignity, like no prostitution, no child labor, some health considerations starting at a low level and then step by step upgrading it until you can be certified against this standard.*” The role of women empowerment was further highlighted: “*Women empowerment throughout the supply chain is a crucial success for sustainability driving forward”* [TA4].

In the context of artisanal and small-scale mining (ASM), mines have very limited power as they are highly dependent on their customers. Creating cooperatives can empower ASM, but also larger mines, to agglomerate sufficient power to gain influence over their customers and to support their requests for cost and benefit sharing. This empowerment can be driven by the mines or by downstream actors who believe in better compliance levels in case cooperatives sign contracts. Empowering mines consequently helps upstream suppliers on the ground. However, “[...] *most smelters have bigger problems than that [to unite to gain power] because they need to wait for the mine efficiently, that comes last, you know, remember these guys are trained to survive, so how do you expect them to negotiate such deeds?”* [GOV1]. Moreover, “[...] *there is that mistrust and individualism and competitiveness in areas, so it may be the exception rather than a more common, where a community can come together and align on a purpose and align on ways to*

organize. I think organization is one of the toughest things that needs to be established here" [MSI10]. Furthermore, the respondent of FIR12 highlighted that some of the larger mines are already powerful and that further empowerment of larger mines will directly come at a cost of the further exploitation of ASM.

4.3 Premiums

Another mechanism referred to in the interviewees is where the cost of due diligence is covered by the local firm but offset by a premium. Similarly, previous studies have shown that customers are willing to pay a premium for sustainability in general and mobile phones in particular (Goebel et al. 2018; Grankvist et al. 2019). FIR4 [Senior Consultant, Compliance & Social Responsibility] summarized it as follows: *"And there's a Fairphone, and the Fairphone costs 30 USD more, but you go to Fairphone's website and it says 'hey, we know exactly where every single piece of material came for this phone. Your money is ensuring that we are reducing forced slavery in the world'". But at the same time: "I've participated three times now at the T.I.C. [Tantalum-Niobium International Study Center] conference, and every time the big players in the tantalum market said very clearly 'we pay world market price, not a single penny more'. So yes, in theory it could solve the problem, but in practice people are just not willing to do it" [GOV3].*

Premiums may then even propagate along the supply chain and increase the burden for local firms, *"because the margins are so tight that, if you want the smelters or the spinning mills to take extra steps, that's a one-time fee. And it shouldn't be amplified. So, I think the real costs to avoid are these premiums that get amplified at every step of the way [...]. So, the premium [...], I mean, basically we're operating on a discount today. We're operating on a discount for child labor, we're operating on a discount for abuse of the environment, we're operating on a discount" [FIR2]. Moreover, premiums increase competition, since they allow for a lower selling price without compromising on profit: "My guess is that there are premiums being paid already and nobody wants to talk about that because a mine doesn't want to share with its competition that it's being paid a premium and have the others then say gosh it would be worth it for us to come up and compete with that [...] purchasers don't like to share that they're paying them because then they think that all their vendors are going to ask them" [MSI3]. In general, "[...] the concept of premiums and discounts becomes very complicated, because you can enforce a discount or you are maybe willing to pay a premium depending on the skewed nature of the local market" [MSI1].*

4.4 Safeguarding the Market and Certifications

The cost of due diligence is covered by the local firm but offset by access to a specific market. One example is known as Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), and Traditional Specialty Guaranteed (TSG), a system introduced by the EU Commission in 1992 to protect the

reputation of traditional products from competition by cheaper imitations that assume the same name as the original (Thøgersen 2010). In the context of minerals, to create a functioning market, non-compliant material must be excluded from sales channels, especially in the context of goods where it is difficult on face value for consumers to determine their provenance because compliant and non-compliant materials cannot be separated (Hofmann et al. 2018). But for this the majority of markets need to be captured, which hinders implementation if materials are available in multiple regions. Moreover, in the case of industrially used minerals, it is rather more likely that non-compliant minerals will be traded at a discount (Hustvedt and Bernard 2008) – *“Because if I don't have compliance, then my gold or my product will sell at a discount”* [Non-executive board member, MSI11]. Still: *“[...] in my opinion, the reason why the minerals program has gotten so much success is because you have 80% of the market demanding that they're in the program. I mean, I've never been [...] you know, when I was one of the auditors, I would get random calls from small recyclers in the middle of China. Or my team would go and we'd have to look at their sales, and we'd say 'well, where are your sales?' And they'd say 'well we haven't been able to sell anything for a year, because we're not in the program”* [FIR2]. This was re-emphasized by TA2: *“So, [the program organization] constitutes over 90% of all the gold that's refined every year, so they played a very big role. So, without them, it would have been a mess”*.

A widely applied mechanism to create premium and safeguarded markets is a sustainability certification scheme, particularly prevalent in the agri-food industry, where it is typically comprised of a label that documents and guarantees that certain products meet environmental, social and human rights requirements (Mori Junior et al. 2016). From the literature on eco-certification it is known that the effectiveness of these mechanisms depends on the existence of well-defined standards enforced at the individual farm (or mine) level by both third-party monitors and a peer-monitoring system (Ibanez and Blackman 2016). This became obvious during the interviews: *“What doesn't work is if we're not aligned to international credible standards. [...] Our members [...] want to know that this program they're engaging with is aligned to best practice and the highest international standards as possible”* [MSI9].

Examples for certification include the Conflict-Free Smelter Program, Fair Trade and Fairmined gold and the Responsible Jewelry Council (RJC) (Young et al. 2014). The Conflict-Free Smelter Program evaluates and provides assurances on the sources of minerals and metals for smelters producing 3TGs. The Fair Trade and Fairmined gold emerged from the work of the Fairtrade Labelling Organization International (FLO) and the Association of Responsible Mining (ARM). It focusses specifically on ASM. Finally, the RJC operates in two parts: a “code of practices” that requires audits of member facilities, and a product focused “chain-of-custody” certification that includes certification of gold and platinum group metals.

However, certification comes at a cost: *“Most large mines, they will produce annual sustainability reports and they will get them audited. If they're a member of the World Gold Council, then they can*

undergo a World Gold Council conflict gold audit, or conflict-free gold audit. That the mine would pay for” [TA1]. Moreover, “[...] the reality of the cost associated with putting that label on that material or that product is that it can completely detract, or it can unload so much cost into the system and everybody becomes so obsessed [...] I say 'obsessed', all the attention gets diverted and their money gets diverted to making the label, rather than changing things on the ground” [INGO1]. So, “[...] wherever certification happens, it should be factored into the price. I mean that's the answer for everybody isn't it? That it's got to be factored into the price and part of that is wherever it happens and part of that price piece is educating society, educating our constituencies about the cost of responsible mining” [NGO5]. But this higher price will in turn limit the market – “If you look into the precious metals industry, then the Fairmined, Fairtrade gold, green gold, then if it goes in the jewelry sector, then yes, you can get a premium for that production” [TA1]. In general, “[...] that would tend to be for gold that's going specifically into jewelry, where you've got the consumer that is making an ethical choice and that purchasing vision. But if it's going to be gold to go in to a catalytic converter in a car, then that's a slightly different conversation” [TA1]. The question remains whether the increase in price can offset the costs. Research found that certified producers of coffee in Nicaragua are more often below the absolute poverty line than conventional producers since coffee prices did not compensate for the decreased yield and additional costs (Beuchelt and Zeller 2011). Thus, total profits for the individual farmers went down. A similar outcome is likely in the context of mines.

Finally, in addition to external certifications, there may also be local ones. For example, “[...] and then these scores are combined together, to create the supplier in like, platinum, gold and silver ranking. And whenever they have their annual supplier days, this retailer is always announcing how the platinum rated suppliers would get the first [...] would have the right to access any new product vendor. So, when the retailer wants to source, it goes to them first and then the platinum rated can say 'yes' or 'no'. When they say 'no' it goes to the gold rated, and so on. So, a lot of suppliers would want to improve their performance. And that's how they kind of distribute the benefit. So, it's like, aid by trade” [FIR1]. This kind of local initiative has much tighter control over market and suppliers, which may increase the likelihood of success.

4.5 Contracts

Under this arrangement, and based on negotiation, the focal and local firms directly agree upon how due diligence costs and benefits are to be shared. Whereas the simplicity and direct accountability of cost/benefit sharing contracts has its advantages, the outcome of the negotiation is a direct function of the negotiation power of the partners, typically resulting in an unwillingness on the side of the buyer to finance any additional costs (Touboulic et al. 2014) – *“I don't think it's possible to put the costing or the pricing into a trade, sort of, negotiation deal, or into a contract type format, because it's very unfairly balanced; from*

the consumer, the processor, who holds the power; to the suppliers who do not” [FIR11]. Consequently, direct cost and benefit sharing contracts are not in wide use in the mineral sector, although India has recently announced that such kind of contracts will be used for commodities (e.g. oil) (Sharma 2021). There are two other major issues with contracts. First, partners may rely on extralegal exchanges, i.e. exchanges where partners do not count on courts to enforce disputes but instead rely on relational enforcement mechanisms, such as in the diamond industry (e.g. Bernstein 1992). Second, contracts may differ in their degree of explicitness (Scott et al. 2020). As due diligence can be understood as knowledge-based co-production of information, work is often left incompletely specified at the time the contract is signed, and the allocation decision is made (or renegotiated) after the service need emerges (Xue and Field 2008).

4.6 Levy Schemes

Under this mechanism, all partners in the supply chain pay a levy, which is pooled and used to pay the costs of due diligence. The most well-known levy scheme in the responsible mineral space is ITSCI, which is in widespread use. The levy scheme is one of the few mechanisms that allows for the fair sharing of supply chain due diligence costs along supply chains; however: “[...] 97% of the cost of ITSCI comes from upstream and less than 1% from downstream, and that’s simply because it’s the miners and the processors and the traders who pay the ITSCI levies” [MSI8]. ITSCI itself indicates that “the vast majority of our funding comes from the upstream supply chain and typically represents 80% or more of annual funding, while contributions from the downstream sector represent less than 1%” (ITSCI 2020). Small-scale levy schemes exist in the mineral field, but most of them struggle in the context of shrinking raw material prices and oversupply of goods as the cost of the levy does not adapt to the market conditions and instead stays rather constant. At the same time: “[...] if the due diligence, for this case we’re talking about ITSCI because that’s a program we belong to, if the levy it represents, I don’t know, from 0.5% or 0.2%, whatever it is, of the value, if that starts rising to a higher level, then it becomes a greater burden, and a very serious burden, to the whole legitimacy, not legitimacy, but the whole efficiency of the business” [FIR11]. Moreover, “[...] if you look at it, the biggest challenge is the international levy, the cost. There is no transparency in [...] what is the basis of determining the levy” [GOV1].

4.7 Government

Instead of letting firms pay for their monitoring, governments could also directly finance due diligence – “[...] the region has to understand that if they don't increase the conditions on the ground, so if they don't manage to somehow build the pre-conditions for responsible sourcing, that they in the medium-run will become a less attractive destination for foreign direct investment” [GOV3]. This would not only guarantee

neutral assessments, but also take the cost burden off suppliers. Surprisingly, it is always assumed the government of the local firm, often in a developing country context, should carry the burden of due diligence costs and not the government of the focal buying firm. But governments in CAHRAs are unlikely to have enough resources to pay for due diligence. Responsible minerals received sizeable investments from a range of governments through several ministries (e.g. the USA, the Netherlands, or Germany) – *“Of course, some of the issues regarding responsible sourcing that slip under the radar will be where you have funded projects that are funded by organizations such as the EBRD [European Bank for Reconstruction and Development] or the IFC [International Finance Corporation], where they have a developmental focus but of course as part of funding a project, funding a mine, there will be a level of due diligence that they will perform as part of that funding process, so in some ways the due diligence process is the least initiated and funded, of and by the funding body, to ensure that they are obviously funding relatively responsible lower risk or de-risk the project”* [MSI1]. However, most of the funding is for the initiation of projects and has a limited time horizon.

So, *“[...] the home countries where companies are listed can play a much bigger role in regulating their own companies in making requirements for their behavior outside the borders of the country where they're registered”* [NGO5]. But even then, a government structure is required, for example to ensure distribution, *“first of all you need an [...] enabling governance framework, where you do not have one, where you do not have a collaborative or cooperative governance structure, whether it be local government or national government, and the governance is not strong, it will always be difficult I think to implement due diligence at the ASM level, basically at the informal level”* [MSI1]. Another issue is the introduction of different due diligence or auditing systems by different governments and bodies: e.g. the USA introduced the DFA, the OECD the Guidance, the EU their own legislation and the Democratic Republic of Congo introduced its own mining code, which was amended in 2018 and which significantly increased taxes on several mining outputs (de Schoutheete et al. 2021). These higher taxes and costs are then usually paid by upstream actors.

4.8 Blockchain and Information

There are two cost-sharing mechanisms to consider here. First, reducing transaction costs, for example, through blockchain technology. Any reduction in transaction costs will lead to a reduction in basic production costs for ethically sourced materials, which in turn will make it more profitable to source in an ethical manner (Choi et al. 2022a). Second, if the client values due diligence information, and if the provision of this information can be monetized, then both the client and the provider of the information can obtain value that compensates them for the due diligence costs incurred. Supply chain partners consequently not only get paid for the service of moving and storing goods, but also for the information provided on how,

when, and where the goods are moved and stored. As FIR4 [Senior Consultant, Compliance & Social Responsibility] highlighted: *“This is exactly how the system aims to level the field by enabling the downstream actors to directly engage with upstream operators, mining operators, interact with them and also either directly financially support them or request further activities and information for a certain exchange”*. However, a major issue is how to share this information. Transparency and traceability are key features of most distributed ledger technologies, such as blockchain. Blockchain provides a decentralized platform for combining validated information from multiple sources (firms in a supply chain, regulators, and consumers), where smart contracts can automate actions, and where the history of the product is available for consumers’ purchase decisions (Babich and Hilary, 2020). Especially in supply chain management and trade, the technology is being hailed as a means of decreasing transaction costs and improved data sharing (Schmidt and Wagner 2019; Wang et al. 2021) and of increasing the visibility, authenticity, and traceability of commodity flows (Hastig and Sodhi 2021; Pun et al. 2021; Tang 2022). Numerous start-up companies, such as Everledger, Cobalt Blockchain Inc., Circular, Peer Ledger and Minespider, have consequently explored the use of blockchain for the enhanced traceability of raw materials.

However, several issues arise which cast doubt on the technology’s panacea promise. For instance, while data sharing might be improved, a big obstacle is the willingness and ability of different supply chain actors to partake in these activities: *“We have the supply chain in the middle, which is unwilling to participate in such traceability [activities]. And this is the current problem that these companies say ‘ah, I don’t want to, there’s a problem, sensitive commercial information and it’s a system I need to enter, I need to log in, it is an effort I should do and so on and so forth”* [Project Manager & Management Consultant, FIR4]. Furthermore, *“smaller participants do not have verification notes because this is a server that you need to maintain [...] with a computer, and nobody is carrying this in rural Congo”* [Project Manager & Management Consultant, FIR4].

Meanwhile, although one of blockchain technology’s most promising features is data immutability, a critical issue remains the data input: *“I think the problem as I see it, for the blockchain providers - you see them at the IMI conference and you see them at the OECD Forum. They are very good at marketing, but ultimately the supply chain can be as secure as anything, as a bank vault, but if you are still putting rubbish in one end then you just have very, very secure rubbish coming out of the other end”* [MSI8]. This is known as the garbage in/garbage out (GIGO) problem (Friedman and Ormiston 2022), which will likely lead to increased relevance of traditional ways of collecting information, questioning the use of the technology itself: *“And all of the kind of blockchain companies who claim to have the solution, you know, again it’s not really addressing the problem, which is whether there’s corruption, or who is working for who, or whatever.*

I mean that's not the thing that you record in the blockchain system unless you've got people on the ground, and if you've got people on the ground, it doesn't really matter how you actually collect the data” [MSI4].

Finally, there are implications associated with the use of new technology itself – since it typically implies significant costs. This requires striking a balance between the benefits of increased, enhanced consumer trust and the additional costs related to the use of blockchain for supply chain management (Choi 2019; Choi et al. 2022b).

5. Discussion

This study conducted interviews to identify and assess different cost and benefit sharing mechanisms. A summary is provided in Table 2. This includes the intention of each mechanism and its actual (often unintended) consequences.

The implications for supply chain management will be discussed next in Section 5.1 before Section 5.2 and Section 5.3 discusses implications for the modern slavery literature and legislation, respectively.

5.1 Implications for Supply Chain Management

[Take in Table 2 approximately here]

When considering the repercussions of sharing mechanisms from a supply chain management perspective, then there are two important observations that can be made from Table 2. First, comparing the intended and actual outcomes, we observe that none of the mechanisms appear to work well. Cost is always ultimately paid by the local firm without any significant added benefit. The maximum benefit achieved by the local firm is their ability to retain the “license to operate” or the “license to sell”, but at a lower margin. Meanwhile, whoever ultimately pays, it remains unknown whether due diligence will actually improve working conditions on the ground. In fact, this is very unlikely since due diligence is executed by the local firm itself. As MS14 stated: *“Audits don’t really work: you go there and there’s a one-off thing, and people show you what they want to show you, and then you go away and you don’t really know what’s going on. So, in terms of high-risk areas it has to be kind of a monitoring system and an on-the-ground system with people there all of the time. And that’s why it’s expensive [...] in reality, it’s not really an answer because the incentive is still for people not to do what they maybe should be doing. So, you need someone to monitor and persuade them to do it [capability-building]”*. So, the slaves end up paying the price for slavery (and diligently reporting about it). In general, firms and government bodies in our study argue that the reason for non-compliance with Western sustainability standards is a question of poverty. Due diligence – according to their opinion – can perhaps help focal firms to market sustainable products, but they will in

turn have limited impact on the root causes in the “exploited” country (Fridell 2022). This is very much in line with LeBaron and Lister (2022, p. 670)’s observations when they allude to “prevailing optimism surrounding global supply chain solutions [as] demonstrably unwarranted”, and further accuse these solutions as resulting in “hidden costs”. In many cases, supply chain due diligence offers ‘cosmetic compliance’ (Landau 2019) but hinders rather than enables progress on the ground (Postma et al. 2021; LeBaron and Lister 2022).

Second, and focusing on the intention of each mechanism, it is surprising that the local firm almost always has to pay first, and then seeks some form of recompense. Otherwise, it is the government of the local firm, and not the focal firm, that pays. In other words, the benefits of due diligence are delayed and only follow after the initial investment has been made. This is in line with the nature of the supply chain where the sourcing of raw materials, which requires due diligence, precedes their sales to the end customer, which creates the benefits. For local firms, there is no benefit without covering the costs upfront. In contrast, the focal firm has the benefit and can decide whether it distributes this or not to other actors. There is an inherent imbalance, and most firms do not adequately redistribute the benefits. One solution appears to be to invert the flow of money and due diligence. For example, the government of focal firms could pay the focal firm and install due diligence to ensure the money arrives at the local firm. The government would then take on an intermediary role. But TA1 explained: *“I don't think it would work, because if you go on to our website you can see the statistics for trading. And lots of gold is traded on a daily basis, but it never actually moves. So, the physical location of the gold stays the same, whereas the ownership changes. So, I don't know how you would take that, who would collect that money or who would tax it. So, I don't really think the government option would work.”*

In general, existing cost-sharing mechanisms are based on the standard business literature and its models. In other words, the producer has to carry the cost of production and only realizes payment after production. In fact, not having a finance solution to cover the production period or working capital gap is one of the biggest hindrances stopping small businesses from entering larger markets around the globe and in becoming more sustainable (Glover et al. 2014; Jia et al. 2020). One anecdotal example from the ASM sector provided at the OECD Forum was that poverty was so significant that local miners would sell their shovels immediately, although NGOs had provided them to increase productivity and to protect miners from digging in the ground with their hands. One solution in the literature to overcome this quandary is supply chain finance (BSR 2018; Wuttke et al. 2013; 2019). Supply chain finance is commonly based on an agreement between a buying firm and its bank, stating that any supplier whose invoice has been released by this buying firm can obtain credit from the bank against the buying firm’s credit rating for the period of the payment terms (Wuttke et al. 2013). Supply chain finance solutions can consequently positively discriminate towards suppliers that provide compliant minerals by giving them access to a better financing

solution and/or better access to capital. In other words, the benefit is paid first by the focal firm by guaranteeing a credit which is used to pay the cost. The focal firm then has an interest to distribute the benefits, so the local firm is able to repay this credit. This also overcomes the disadvantage of ASM suppliers due to the risk avoidance of banks or the required maturity levels of businesses – *“The root problem is access to finance for the miners. If they had access to finance they could get- They'd be in a stronger position, they wouldn't rely on traders and comptoirs for finance”* [MS18]. Supply chain finance would link focal and local firm and shift the risk to the focal firm. The focal firm, which has more power and resources than the local firm, would consequently have an interest in due diligence to reduce this risk (Tseng et al. 2018).

Power imbalances in supply chains can generally be seen as a main barrier in exchange relationships when it comes to fair value distribution (Schleper et al. 2017). The uneven allocation of power among supply chain actors allows more powerful actors to claim disproportional shares of value (Crook and Combs 2007; Reimann and Ketchen 2017; Sovacool 2021) and the “contest for value appropriation” between different participants in global supply chains usually favors the downstream actors in the global north (Nachum and Uramoto 2021). While a large body of supply chain management research has focused on value creation (e.g. Jayaram et al. 2007; Zhu et al. 2018), a holistic integration of value appropriation has so far been neglected (Holweg and Helo 2014) despite its prominence in the global value chain and stakeholder literature. Value creation processes involve multiple parties, within or across firm boundaries, who face high task and outcome interdependence in providing mutually supportive contributions to value creation (Bridoux and Stoelhorst, 2016). In this context, joint value creation rests increasingly on external stakeholders, such as suppliers (Bridoux and Stoelhorst 2022). This perspective is also prevalent in stakeholder theory, which advocates the involvement and management of all external stakeholders to achieve joint value creation (Freeman, 1984; Freeman et al. 2007; Phillips, 2003). Previous literature has indicated the supremacy of collaborative stakeholder management over competitive and narrow approaches based on power asymmetries regarding value creation (Harrison et al. 2010; Jones et al. 2018). Future research needs to explore how value creation and appropriation can be achieved in a fair manner through various forms of stakeholder governance (Bridoux and Stoelhorst 2014; 2022), including suppliers and other stakeholders beyond dyadic buyer-supplier-relationships.

One candidate to achieve fairer supply chains – which is frequently mentioned in the literature – is via the empowerment of weaker supply chain actors (Quayson et al. 2021; Reinecke & Donaghey, 2021). But our interviews highlighted that neither empowerment nor premiums are a solution. Individual empowerment will only work if people on the ground cooperate, i.e. create union-like empowerment (Reinecke and Donaghey 2021), which is very unlikely given poverty. Premiums will be handed down given the lack of empowerment of the suppliers, and it will be priced into the final cost to stay competitive.

Providing cheap credit acts as a discount and supply chain finance has been found as a means to alleviate poverty in developing countries (Sim and Prabhu 2017; Tseng et al. 2018). It allows compliant materials to enter the market at a lower cost. To the best of our knowledge, ensuring the competitiveness of compliant materials is the only way to incentivize compliance because it is likely that there will always be a market for non-compliant materials. Future research is needed that designs new solutions from the bottom up to address these specific needs as existing supply chain solutions seems to fail (LeBaron and Lister 2022). For this, Table 3 summarizes the main contextual factors that need to be considered in the design that emerged out of our interviews.

[Take in Table 3 approximately here]

As mentioned above, a key challenge to the introduction of due diligence and/ or auditing schemes in general is the too narrow focus on cost sharing in supply chains. If cost sharing is discussed, then benefit sharing needs to be considered as well. However, the local firm (on average) will always be at a disadvantage in comparison to the status of the focal firm before the introduction of the due diligence scheme without benefits, no matter how small the cost proportion is that the local firm pays. Due diligence cost-sharing mechanisms can therefore only work if local firms receive a share of the due diligence benefits that are reaped in the downstream market or can directly improve productivity in their own operations. Passing due diligence requirements along supply chains will provide goodwill for firms down the supply chain, but it will have limited effect on changing working conditions for the weakest links in the supply chain (Landau 2019; Postma et al. 2021). Without the financial commitment of focal firms (or their governments) to act on the ground, the fair sharing of due diligence costs seems impossible to achieve.

5.2 Implications for the Literature on Modern Slavery

This paper is focused on conflict minerals, a context where human rights abuses, including modern slavery practices, are common. It therefore connects the literature on modern slavery (e.g. Gold et al. 2015; New 2015) with the literature on conflict minerals (e.g. Kim and Davies 2016; Hofmann et al. 2018; Swift et al. 2019), which have in general been treated separately. More specifically, we argued that the general literature on modern slavery can benefit from findings on conflict minerals, where legislation is stricter.

Our study complements the extant modern slavery literature that has examined how firms can detect and remediate modern slavery in their supply chains. For example, whereas Benstead et al. (2018) examined the role of horizontal collaboration in addressing the modern slavery threat, this paper focused on vertical supply chain relationships and the distribution of due diligence costs across the supply chain. By incorporating data on mining, our study also provides insight into the upper tiers of supply chains in a developing country context. This extends literature that mostly focused on the downstream, Western

buyer's approach (Fridell 2022) to disclosure and the effects of compliance with modern slavery legislation (e.g. Cousins et al. 2020; Flynn et al. 2020). In general, addressing modern slavery likely requires an investment in due diligence, and due diligence will only be effective if the costs and benefits of due diligence are shared fairly and proportionately across the relevant actors.

Our paper has examined eight different cost-sharing mechanisms, all of which have unintended consequences, thereby adding to the literature on the unanticipated outcomes of sustainability initiatives and regulation (e.g. Koch and Kinsbergen 2018; Carter et al. 2020; Matos et al. 2020). This adds to the richness of the modern slavery literature, which has not adequately explored this issue, and it uncovers the ground realities behind implementing well-intended legislation. The modern slavery literature frequently acknowledges that firms need to look at how their own procurement practices exacerbate the threat of modern slavery (e.g. New 2015; Stevenson and Cole 2018), but this typically refers to firms demanding shorter lead times and lower prices, which can incentivize suppliers to outsource operations to unregulated subcontractors where unscrupulous labor practices take place. This in turn can lead to a reinforcement rather than an abolishment of modern slavery practices (Anner et al. 2013; Clarke and Boersma 2017; Dindial et al. 2020; Caspersz et al. 2022)

Our paper complements this line of work by providing a detailed understanding of how firm behaviors informed by traditional business practices can be counter-productive to addressing modern slavery in the context of conflict minerals. It provides new insight into why modern slavery remains such a prevailing grand challenge in modern society. To address these challenges, new practices need to be designed and problems rethought.

5.3 Implications for Legislation

Various criticisms are levelled at modern slavery legislation and there are calls to strengthen the requirements placed on firms (LeBaron and Rühmkorf 2019; Monciardini et al. 2021). But our findings in the context of conflict minerals, where stricter legislation is a reality, questions whether this provides an answer. Similar to Aula (2020) and IPIS/ULULA (2019), who found that the impact of mandatory due diligence on violence remains ambiguous, our findings question the usefulness of mandatory due diligence in its current form for resolving slavery in conflict mineral supply chains. A main question which emerges is whether legislation can constrain a market if there is no international and local legal structure for enforcement. In the end, legislation relies on a legal structure. If not, then one often relies on a free market, and the key to ensuring compliance and improving something for people on the ground is to ensure the competitiveness of compliant materials. Thus, instead of premiums, there should be discounts. For industrial applications there will always be a market for non-compliant materials, and the only way to overcome non-compliance is by being cheaper. The same holds for general commodities, such as gold.

Meanwhile, the economy still speaks the language of money (Luhman 1988), and a shift in end-customer buying behavior might change firm behavior. The most important part of any supply chain is the customer, who with their choices impacts the supply chain design. Creating social awareness, and holding customers accountable for their choices, is likely to have the largest reverberation across the whole supply chain, although caution is advised as Crane et al. (2021) emphasize that consumers might not actually act on information about slavery in supply chains as found in prior research (Smith and Jones 2020).

Nonetheless, prior studies found that customers are willing to pay for sustainability in supply chains, both B2B and B2C (Goebel et al. 2018; Grankvist et al. 2019). If customer accountability is high, such as for diamonds or cloths, then the end-customer will ensure compliance and often just choose compliant products, for example to gain social approval or avoid disapproval. If it is low, as in a smartphone or raw materials for clothes, then competitiveness is the only way to ensure compliance. That it is a question of customer accountability, rather than visibility, is highlighted by the fact that most people are aware of the use of conflict minerals in mobile phones (but they are not held accountable). Measures that create awareness and increase the accountability of end-customers will therefore likely be more effective than introducing legislation aimed at increasing accountability of (often impersonal) focal firms, or local firms on the ground.

In general, the repercussions of changes to legislation need to be carefully thought through as legislation intended to improve conditions on the ground could have no effect at all or a negative one if it is not implemented effectively. As Landau (2019, p. 20) puts it when she calls for “meta-regulation”, more scrutiny should be dedicated to quality and less on quantity of legislation, with regulators and policy makers constantly “engaging in learning about the problems they are trying to manage and the industries on which they are focusing, and assessing and improving their regulatory strategies”. Overall, this highlights the importance of a holistic approach to solving grand challenges like modern slavery.

6. Conclusions

This study connects the literature on modern slavery with that on conflict minerals – these two topics are often treated separately because they are governed by different legislation, yet conflict minerals often involve and inflict slavery. Assessing the impact of mechanisms such as due diligence in the context of conflict minerals, where legislation is stricter, thus provides important insights on the potential effect of stricter legislation for modern slavery in general.

Our study provides empirical insight into the challenges of addressing grand challenges like modern slavery by exploring how the costs of due diligence are actually shared in practice. This is important since any legislation will incur costs which should be offset by the benefits for the people it is intended to protect. Our first research question asked: How are due diligence costs and benefits actually distributed in practice?

In response, we found that, in practice, the costs are not absorbed at the point most targeted by the legislation, rather they are often deflected upstream to those with fewer means to pay. This is a counter-intuitive insight and an unintended consequence of due diligence mechanisms for the people the legislative demands are aimed at protecting, i.e. it is the slaves that pay for slavery. Like the literature on conflict minerals, the modern slavery literature also lacks sufficient attention on how to make long-term socio-technical changes that establish a platform for creating fairer, more ethical supply chains. Rather, it focuses mainly on how firms can detect and remediate modern slavery in their supply chains, on what they report they are doing about modern slavery, and the impact of disclosures on shareholder wealth. This study found that most cost-sharing mechanisms in practice assume that the local firm (or their government) first pays and later receives some form of recompense. Most fail because this recompense is never realized.

Our second research question asked: Through which means can (and should) due diligence cost and benefits be appropriately shared? We consequently argued that inverting the sequence of payment, i.e. the focal firm guarantees payment and later receives compliant products, appears to be a better solution. This can be realized through innovative mechanisms such as supply chain finance. In general, there is a lack of contextualization of solutions, with most approaches being taken from the wider literature. We found that grand challenges, such as modern slavery, cannot be addressed by standard solutions and therefore call for more research rethinking problems and designing new solutions. Finally, in questioning the usefulness of mandatory due diligence, the findings have important implications for future legislation on modern slavery.

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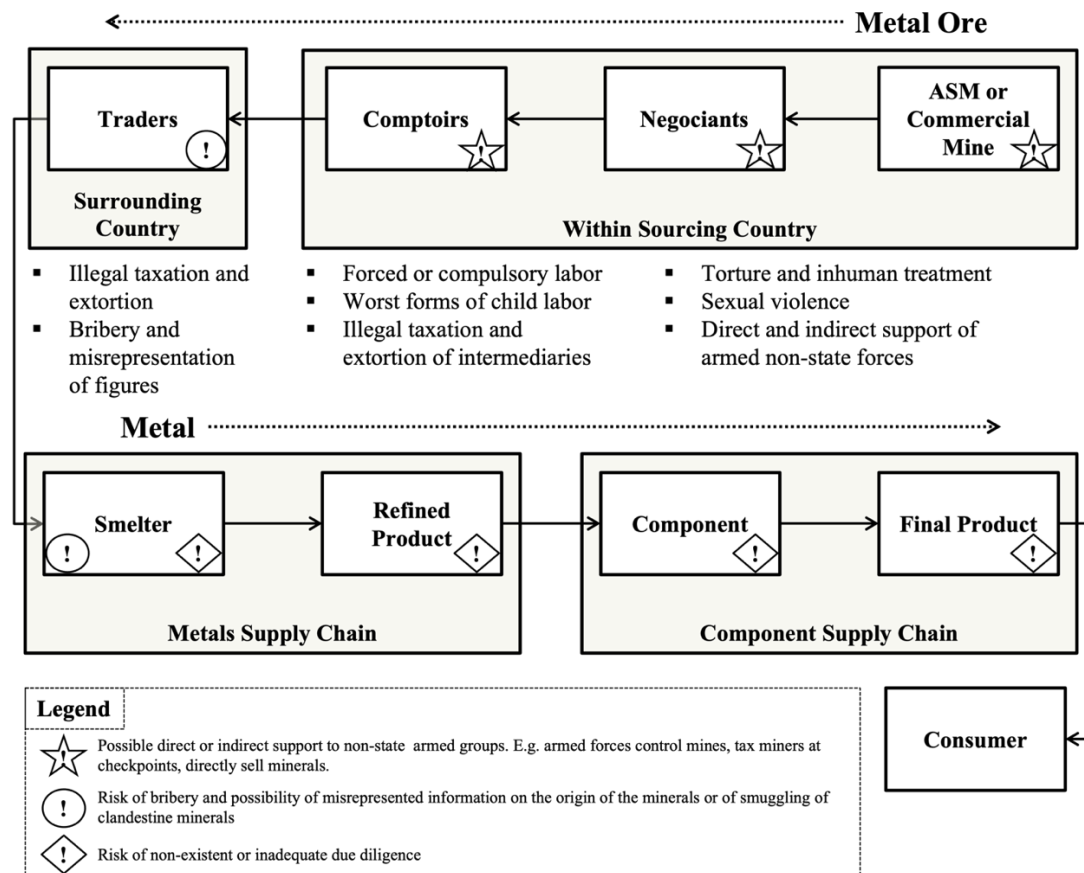
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Tables and Figures



Metals Supply Chain

Smelter ! ◇

Refined Product ◇

Component Supply Chain

Component ◇

Final Product ◇

Consumer

Legend

- ☆ Possible direct or indirect support to non-state armed groups. E.g. armed forces control mines, tax miners at checkpoints, directly sell minerals.
- ! Risk of bribery and possibility of misrepresented information on the origin of the minerals or of smuggling of clandestine minerals
- ◇ Risk of non-existent or inadequate due diligence

Figure 1. Simplified depiction of a (conflict) mineral supply chain (adapted from Hofmann et al. 2018).

Table 1. Summary of cost and benefit sharing mechanisms that emerged in the interviews.

Cost Sharing via	Times Discussed	Discussed in
<i>Supplier Development</i>	30	FIR1, FIR2, FIR3, FIR4, FIR6, FIR7, FIR8, FIR9, FIR10, FIR12, FIR13, TA1, TA2, TA3, MSI1, MSI2, MSI4, MSI5, MSI6, MSI9, MSI10, MSI12, INGO1, INGO2, INGO3, NGO1, NGO2, NGO4, NGO8
<i>Supplier Empowerment</i>	08	FIR8, FIR9, GOV1, TA4, MSI5, MSI9, MSI10, MSI12
<i>Premiums</i>	23	FIR1, FIR2, FIR3, FIR4, FIR13, GOV3, TA1, TA2, TA3, MSI1, MSI2, MSI3, MSI4, MSI5, MSI6, MSI10, MSI11, MSI12, INGO1, NGO1, NGO2, NGO4
<i>Safeguarding the Market & Certifications</i>	46	FIR1, FIR2, FIR3, FIR4, FIR5, FIR6, FIR7, FIR13, GOV1, TA1, TA2, TA3, MSI1, MSI2, MSI3, MSI5, MSI6, MSI9, MSI10, MSI12, INGO1, INGO3, NGO1, NGO2, NGO3, NGO4, NGO5
<i>Contracts</i>	16	FIR1, FIR2, FIR4, FIR5, FIR6, GOV1, TA1, TA4, MSI1, MSI4, MSI6, MSI8, MSI9, MSI11
<i>Levy Schemes</i>	10	MSI10, MSI11, FIR5, FIR6, TA1, GOV1, MSI4, MSI5, MSI8, NGO3
<i>Government</i>	29	FIR1, MSI10, MSI12, FIR3, TA4, FIR4, FIR5, GOV3, FIR7, FIR8, FIR9, FIR10, FIR13, GOV1, TA1, MSI1, MSI2, MSI5, MSI6, MSI8, INGO1, NGO1, NGO2, NGO3, NGO4, NGO5, NGO8, INGO3
<i>Blockchain and Information</i>	14	FIR1, TA3, FIR3, FIR4, GOV3, FIR6, FIR10, FIR12, TA1, MSI1, MSI4, MSI8, NGO1, NGO4

Table 2. Cost and benefit sharing mechanisms, intended consequences, and reality.

Cost Sharing via	Intention	Reality / Unintended Consequences
<i>Supplier Development</i>	The focal firm pays for training; due diligence costs are then covered from the local firm through increased productivity.	The costs for people on the ground increase but no benefits are realized. While funds are provided for training, this training means people on the ground lose time and carry the burden – due diligence training does not appear to increase productivity.
<i>Supplier Empowerment</i>	To create a power balance with focal firms, local firms organize or become legal entities that can rely on the law. Power balance facilitates a fairer share of costs and values.	An organization requires some kind of structure (e.g. a constitution). Local firms seldom have the capabilities to create these structures or to use the law to create a power balance.

<i>Premiums</i>	The cost of due diligence is covered by the local firm but offset by a premium price.	The premium needs to be paid. If there is an individual end customer, then they may pay. However, this creates competition since the premium is counted by the competing firm, which can offer a lower price. So, the selling price (before premium) may become the production cost minus the premium. But the large part of the market is industry (not end customer), and here market prices are paid. Since the end point of the supply chain does not pay, all premiums paid between the focal and local firm are paid by the local firm. There is therefore an amplification of costs.
<i>Safeguarding the Market & Certifications</i>	The cost of due diligence is covered by the local firm but offset by access to a specific market through certifications.	Relies heavily on protection of the market. Non-compliant products will be sold at a discount, which even increases competition for compliant products. There is no way to safeguard market minerals such as gold. Certification increases the costs and diverts attention from the core business. Certification for due diligence relies on supplier development. It is unlikely that certification increases protection of the market for certified firms.
<i>Contracts</i>	The focal and local firm agree on a fair distribution of the costs, which is then formalized in the contract.	Contracts only cement the power imbalance (see supplier empowerment). Local firms do not have the capability to negotiate robust contracts or to write contracts with the required degree of explicitness. Local firms often rely on extralegal exchanges, while focal firms just recognize legal exchanges.
<i>Levy Schemes</i>	All partners in the supply chain pay a levy, which is pooled and covers the costs of due diligence.	A large share of the levy is paid by local firms – focal firms paid less than 1% in one case of our sample. Levy costs directly hit the profits of local firms, and there is no transparency or legitimization of the size of the levy.
<i>Government</i>	The government pays the costs of due diligence.	‘Government’ typically means the government of the local firm (not the focal firm). These governments in conflict mineral settings have restricted resources, and are not structured to distribute subsidies.
<i>Blockchain and Information</i>	Tracking and tracing creates information that adds value to goods. This value is transferred upstream to compensate for the costs of due diligence, which are initially covered by the local firm.	Blockchain does not presently allow for tracking and tracing, instead creating redundancy and decentralization (anonymity). It also requires continuous access to the internet. Most importantly, it does not ensure due diligence since garbage in just means very secure garbage out. Due diligence still needs to be ensured on the ground.

Table 3: Contextual factors affecting cost and benefit sharing mechanisms.

Contextual Factor	Brief Description and Example Quotation
<i>Country</i>	<p>Every country context is different. <i>“The cost thing is different, of course based on the country. So, the [...] costs that companies have to bear, is all based on the country that they live in. So, the cost in India is much different than the cost in China, or in Europe anyway, or in Italy.”</i> [NGO2]</p>
<i>Size of the Firm</i>	<p>Small firms are different to larger firms or organizations. <i>“If you leave it to the market then, you know, no one is interested in the DRC, there would be no project anyway. It's just a small supplier, a small supply area, and if, like the gold initiatives, you focus on large scale mining rather than artisanal mining, it's quite easy just to say that we won't include this supply area in our system or in our initiative.”</i> [MSI4]</p>
<i>End Customer</i>	<p>Assignable end customers (that can be blamed) are different from unassignable customers. <i>“[...] That would tend to be for gold that's going specifically into jewelry, where you've got the consumer that is making an ethical choice and that purchasing vision. But if it's going to be gold to go into a catalytic converter in a car, then that's a slightly different conversation.”</i> [TA1]</p>
<i>Type of Mineral</i>	<p>Every mineral is different in terms of process, origin, market, physical property, etc. <i>“You need to consider that every mineral is still different and even every production area may or may not come to the same conclusion about what can work and what can't work.”</i> [MSI4] <i>“Gold is used also to wash money [...] To avoid taxes. So, it's more complex, you see that. Or to finance conflict, or to buy arms.”</i> [MSI3]</p>