The Extractive Industries and Society 13 (2023) 101226

Contents lists available at ScienceDirect

The Extractive Industries and Society

journal homepage: www.elsevier.com/locate/exis

Original article

Corporate social responsibility and economic growth in the mining industry

Mohammad Yousefian [a,*], Marc Bascompta [a], Lluís Sanmiquel [a], Carla Vintró [b]

[a] Department of Mining, Industrial, and ICT Engineering, Polytechnic University of Catalonia, Manresa, Spain
[b] Department of Management, Polytechnic University of Catalonia, Manresa, Spain

A B S T R A C T

This research provides insight into the effects of implementing Corporate Social Responsibility initiatives in the mining industry in the European context. In many cases, the strategy is not coincident for shareholders and stakeholders, and as a result, the mining activity could be jeopardized. Achieving socially responsible goals can be a challenging task to conduct. This study aims to examine the relationship between Corporate Social Responsibility (CSR) performance and the economic growth of European mining companies using fixed effects regression models in addition to content analysis. Data from 45 medium- and large-sized mining companies is analyzed from 2018 to 2021. The models were created to assess the relationship between the companies' economic and social responsibility performances. The findings of this paper confirm that Corporate Social Responsibility positively affects the economic growth of companies, including their profitability and firm value. Furthermore, the affecting CSR indicators are identified with respect to each economic indicator, with training, health & safety, and community development being the most common impacting indicators.

1. Introduction

The mining sector is one of the most controversial industries in the sense that, at the same time that it is beneficial to society, it can be a threat to it. Due to the growing concentration on Corporate Social Responsibility (CSR) and the development of various standards and principles in the mining industry around the world specifically for CSR, an analysis of the relationship between Corporate Social Responsibility and economic performance in the mining industry of Europe seems to be necessary. The mining industry is linked to a country's economy and natural resource activities, including mining. A country's economy is related to its extraction industries (McMahon and Moreira, 2014). Among them, mining industries have grown dramatically in the past few years in periphery and core countries (Pietrobelli et al., 2018). Europe is responsible for 7% of the world's mining (World Mining Data, 2022). With almost 4.94 billion euros of GDP from mining in some leading European countries (Trading Economics, 2022a), the mining industry has experienced a 1.20 percent increase in the European Union during the last year (Trading Economics, 2022b), and by adopting measurements, including improving governance institutions, mining can continue to be beneficial to its stakeholders to a greater extent (Corrigan, 2017).

Mining companies have been a pivotal sector, having a prominent impact on social welfare (Esteves, 2008; Parker and Cox, 2020), economic improvement (Sagebien et al., 2008), and environmental management (Ruokonen, 2019) in Australia, Southern Africa, Canada, and Finland, respectively. The term "social license," which was originally used to describe the difficulty of establishing a relationship between local communities, organizational behavior, and Corporate Social Responsibility, has come to represent community support during mining operations. The phrase is now a prescriptive standard that business actors strive to meet (Hitch and Barakos, 2021). Among central and eastern European countries, mining has contributed to infrastructural development and poverty reduction (Tsaurai, 2021). On the other hand, mining has been deemed a harmful activity to the environment and society, such as in terms of employment opportunities or prosperity (Suopajärvi et al., 2016). Even with regular reports and disclosures, NGOs are still skeptical about the mining industry and its responsibility (Dashwood, 2007). Thus, sustainability, contribution to sustainable development goals, and social responsibility have been gaining importance and turning into strategic goals for decision-making inside the sector (Govindan et al., 2014).

Due to the fact that mining operations occur in dictating locations and mining companies cannot relocate their activities, they need to establish and maintain a good relationship with indigenous, local, and societal groups. Otherwise, they could lose their Social License to Operate (SLO). As a result, CSR for mining companies must be perceived as a way to collect various stakeholders together and, simultaneously, improve the reputation and development of a company (Azzone et al., 1997). Gorman & Dzombak (2018) believed that, based on the nature of

* Corresponding author at: Mining, Industrial, and ICT Engineering, Polytechnic University of Catalonia, Av. de les Bases de Manresa, 61 - 73, 08242 Manresa, Barcelona, Spain.
E-mail address: mohammad.yousefian@upc.edu (M. Yousefian).

https://doi.org/10.1016/j.exis.2023.101226
Received 10 December 2022; Received in revised form 14 February 2023; Accepted 16 February 2023
Available online 25 February 2023

extractive industries, sustainable mining includes the implementation of practices during the operation phase that bring about social and environmental improvements compared to traditional resource exploitation methods, as well as diminishing adverse effects while perpetuating the miners' health and safety, and all stakeholders, including engaged communities. The range of society's expectations from the mining industry is wide (Frederiksen, 2019). Nonetheless, there are a few recurring items, including environmental preservation, human rights, health and safety of employees, integration with sustainable development goals, and corporate governance (Vintró et al., 2012; Mason et al., 2014; Bascompta et al., 2022).

In this paper, the authors remained neutral with regard to their standpoint on the role of Corporate Social Responsibility in reaching sustainability in mining (Frederiksen, 2019; Pozas et al., 2015). According to Shirasu & Kawakita (2021), concentrating on all stakeholders, and not only shareholders, through CSR initiatives can result in the financial growth of the firm in the long run. Education, employment, and health for locals (Mbilima, 2021), cultural and recreation programs (Millington et al., 2019), economic development (Frederiksen, 2019), employees' health and safety, environment protection (Chen et al., 2021), and facilitated access to financing (Abuya and Odongo, 2020) can happen due to CSR initiatives implemented by mining companies. Although responsible mining cannot be defined in the same way for all mining scenarios, it can be defined in a broader sense as a mining activity that: (1) obtains consent from local communities before local officials; and (2) conducts a thorough assessment of all potential environmental impacts and risks (Broad, 2014).

A study by Mutti et al. (2012) investigated the relationship between CSR and the socioeconomic, prosperity, and sustainable development of mining communities in Argentina from the perspective of key stakeholders. Their study depicted that voluntary self-regulation of CSR initiatives in situations that are characterized by incompetent governance is against the will of institutional and social stakeholders. It also claims that companies can improve their CSR in areas such as communication, transparency, and stakeholder engagement to achieve better results. Furthermore, during their study on the impact of Corporate Social Responsibility on corporate financial performance in extractive industries in China, Pan et al. (2014) found that responsibility toward shareholders, employees, the environment, suppliers, customers, and consumers has a significant impact on the financial performance of the company. Currently, the mining industries of European countries are moving toward a contribution to economic benefits in an ethical manner, developing their sustainability practices to improve their reputation and market share, and preserving the environment while fostering their CSR activities (Ivic et al., 2021). Thus, European mining firms are willing to understand the correlation between their expenses on CSR initiatives and their economic performance over a period of time.

Due to the aforementioned arguments, this paper evaluates the impact of CSR initiatives on the economic performance of mining companies in Europe. It is hypothesized that CSR spending in mining firms has a positive correlation with their economic performance, and identifying impactful criteria is considered one of the main means of influence on the economic performance of the firm caused by Corporate Social Responsibility. Therefore, this study scrutinizes the association between CSR and the economic performance of European mining companies listed on CSR Hub based on firm size. Our research shows a remarkable association with the literature in two ways. Firstly, it depicts the positive contribution of CSR initiatives to the economic growth of European mining companies, given the two prominent aspects of economic growth: capital and labor. Secondly, with regard to our analysis, we identify the channels through which mining companies can boost their economic performance. This study can also contribute to scholars, legislators, or experts providing additional insights so as to develop more comprehensive policies or frameworks in line with the interests of mining companies and all their stakeholders. Our study is a pioneer in assessing the impact of CSR on the economic performance, rather than solely financial performance, of European mining companies, as far as we are aware. Correspondingly, academics could benefit from our research findings to develop innovative strategies promoting sustainable development and improve the reputation of the mining industry among its stakeholders.

The remainder of the paper is organized as follows. The next section of the paper provides a comprehensive review of earlier studies relevant to this research. This is followed by the methodology and the theory linked to the study. The results of our study are then presented, followed by the Discussion and Conclusion, respectively.

2. Literature review

The definition of Corporate Social Responsibility has a wide range and has evolved over time. Although there is no specific definition of CSR for the mining industry, in general, it is defined as the commitments of a company with regard to the environment and society and to provide local communities with benefits, mainly on a voluntary basis (Abuya, 2016; Slack, 2012). There are discussions about whether CSR initiatives can turn into profit or not. As a matter of fact, stakeholders can set the benefits for a company as the initiatives are tied to the business activities rather than the act. CSR can also be driven by a range of contemplations, such as a moral obligation to human rights, societal welfare, and protecting the economic activities of a company (Mulhern et al., 2020). Creating a common ground for all stakeholders is a challenging task for most mining companies. It is argued that the social responsibility of mining companies can evolve according to the harmony of the economic development and profitability of the company (shareholders) and move toward sustainability (stakeholders), which can be done through CSR initiatives (Vintró and Comajuncosa, 2010).

Given the wide range of impacts of the mining industry on all Sustainable Development Goals (SDGs) (UNDP, 2016), as shown in Fig. 1, in order to reach the aforementioned objectives, more financial allocation is required (Sisto et al., 2020).

Furthermore, mining companies primarily use CSR initiatives aligned with the SDGs, investing significant resources to create value, preserve, and occasionally change the favors of stakeholders due to financial market pressures and reputation concerns (Mzembe and Meaton, 2014). On the other hand, CSR activities can act as a means to address the social and/or environmental issues created by mining companies. As the literature indicates, companies implement CSR as a channel for philanthropic activities to benefit communities through the establishment of various facilities and infrastructures (Mzembe and Downs, 2014; Abuya and Odongo, 2020; Zainuddin Rela et al., 2020). As an example, the "Hirak" movements (community protests) in mining regions grew more intense in the wake of the events of the Arab Spring in 2011 and the widespread demonstrations of the February 20th movement in Morocco. CSR initiatives were started by a state-owned mining corporation in a mining region that trailed far behind in terms of regional development on multiple fronts. The more corporations imposed societal engaging activities, the more social peace they fostered (Mehahad and Bounar, 2020). The issue of balancing the benefits of shareholders and stakeholders was a challenge for the government of Canada in the extractive industries that were handled (Wanvik, 2016). This was possible due to the fact that the Canadian Government turned its social and environmental planning into corporate stakeholder management through the assignment of CSR departments of multinational corporations as responsible. It has shown that a shift in the power position through three different but correlated courses, namely the "government" to "governance" process, the development of what is being called a post-political condition, and the improvement of CSR initiatives toward stakeholder management, can show significant positive results.

Outside of the mining industry, a new line of investigation on the nexus between financial performance and multiple CSR criteria has been concentrated in various industries with specific CSR indicators including food (Partalidou et al., 2020), automotive (Lin et al., 2020), hospitality

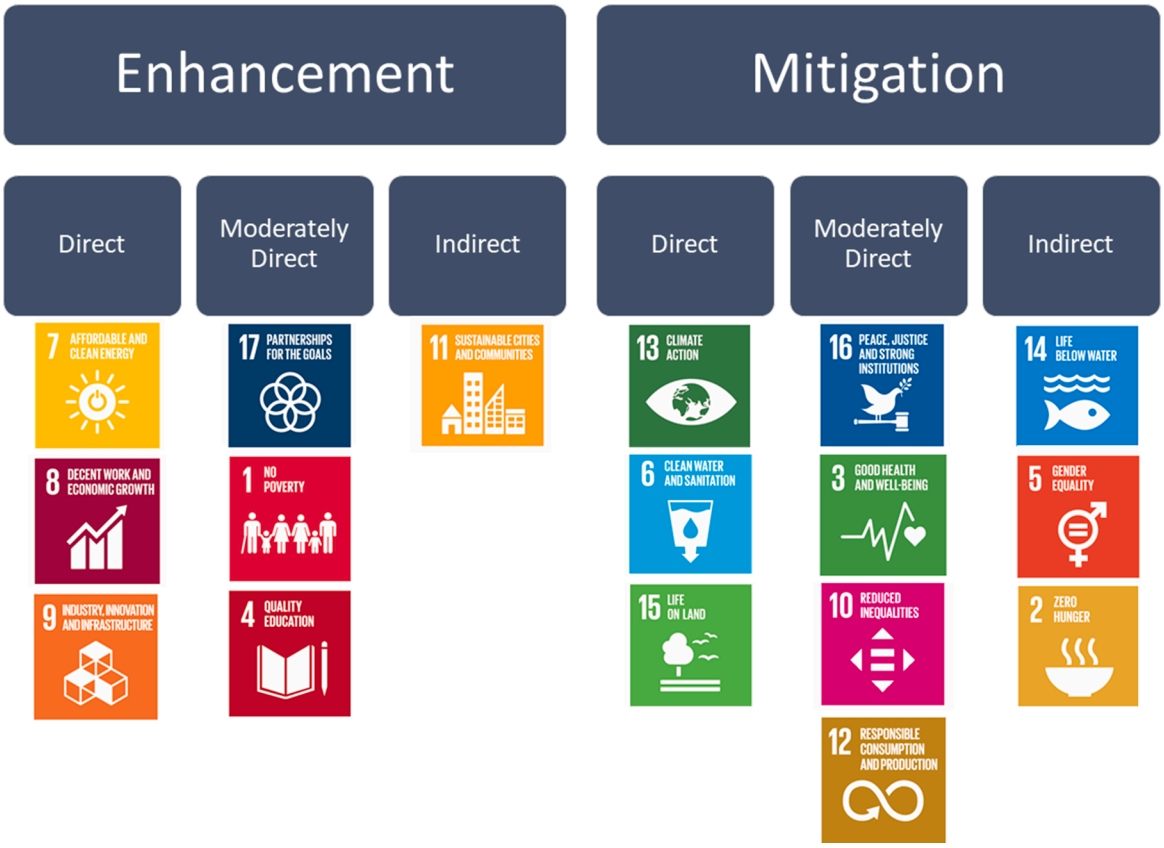

Fig. 1. Impact of the mining industry on the SDGs.

(Franco et al., 2020; Uyar et al., 2020), and banking (Maqbool and Zameer, 2018; Siueia et al., 2019). This growth of research interest may have a correlation with the rapid development of the aforementioned industries. Another novel approach to CSR and company financial performance has been the investigation of the relationship between a specific CSR indicator, such as water management, and the supply chain. For instance, Weber & Saunders-Hogberg (2020) examined the relationship between water management as a CSR indicator and the financial performance of the food and beverage industry using structural equation modeling, resulting in a positive influence of CSR on financial performance as the conclusion, and Hsu et al. (2022) found that CSR positively affects the value added to the supply chain. Also, there are studies on the mediating roles of ownership (Akben-Selcuk, 2019), reputation (Fourati and Dammak, 2021) leadership (Javed et al., 2020), and diversity (Kahloul et al., 2022) with regard to financial performance and CSR. On another note, based on the country classification – being developing or developed – there might be differences that may affect the implemented CSR by companies; the government influence in developing countries like China is heavier than NGOs and private organizations (Tan-Mullins and Hofman, 2014; Ji and Miao, 2020) which can lead to decrease the CSR-financial performance relationship (Long et al., 2020), whereas the interference of government is at the lowest possible and the CSR plans are often directed by corporations (Bhatia and Makkar, 2020). Except for a CSR-regulated country, like India as an example, the majority of companies in developing countries may not be as frequent as those in developed ones (Dobers & Halme, 2009). Furthermore, CSR initiatives are considered charity activities in developing countries such as India, Pakistan, and Lebanon (Kvasničková Stanislavská et al., 2020) with low transparency and engagement rates on media (Sharma, 2019), while in developed countries, consumer engagement through social media is high due to the fact that in these countries CSR is mainly used to attract more consumers (Chu et al., 2020).

On the whole, studies on CSR effects on firm performance in the mining industry are categorized into two groups. First, despite being disputed, a large number of researchers have provided evidence of the positive effect of CSR on corporate financial performance (Orlitzky et al., 2003). CSR activities are considered a positively effective tool to enhance the satisfaction, psychological capacity, and moral identity of employees (Al-Ghazali et al., 2021). It is argued by Moon & Choi (2014) that companies can benefit from their ethical identity in a way that achieves the satisfaction of stakeholders, which results in the growth of their financial performance. In another study, Devie et al. (2019) investigated a sample of 40 mining companies listed in the Indonesian Stock Market from 2008 to 2016. The findings of this study show an overall positive impact of CSR initiatives, although the correlation gets stronger in the long term. In spite of the significant negative effect of risk, due to the dramatic negative correlation, it is concluded that even when involving risk, CSR impacts the financial performance of the companies in the long run. In a related study done by Nguyen et al. (2022), it is corroborated that the positive influence of CSR on the financial performance of firms is more observed in mining firms compared to non-mining ones. Kludacz-Alessandri & Cygaska (2021) examined the relationship between CSR performance and critical business result indicators in 219 international energy companies. The study confirms that adopting proper investment policies in CSR practices can boost the business outcomes of the sector.

By evaluating 39 mining companies in Indonesia, Fadrul et al. (2021) assessed the effects of CSR on firm value. The results of this study confirm that except for institutional ownership, managerial ownership, CSR activities, and financial performance have a significant impact on the value of a firm, considering that financial performance can even partially act as a mediator to the adverse effect of institutional ownership. On a similar trajectory, Nyeadi et al. (2018) studied the association

of firm financial performance with CSR in the extractive industries of South Africa. The study is done with a sample consisting of 56 companies listed on the Johannesburg Stock Exchange during 2011–2013. It reveals the robust impact of CSR on the financial performance of companies, specifically larger firms, with no relationship between social and environmental indicators influencing firm performance.

The second results group belongs to the studies that indicate the neutral or negative effect of CSR initiatives on firms' financial performance in the mining industry. Kumala & Siregar (2020) investigated the relationship between CSR, family ownership, and earnings management of 105 Indonesian mining companies between 2012 and 2014. The results indicate a negative association between the indicators mentioned and family ownership, which acts as an emphasizer. A study by Weber & Banks (2012) suggests that there is no clear relationship between sustainability performance and the financial performance of companies in the extractive industries. With a sample of 262 Canadian extractive companies, the study used 166 criteria in the categories of business ethics and product responsibility, the environment, community issues, and corporate governance. The results indicate that although Canadian companies have better financial performance compared to their international competitors, they underperform on social and environmental issues. Moreover, Chetty et al. (2015) performed a regression analysis on companies listed on the Johannesburg Securities Exchange Socially Responsible Investment Index (JSE SRI Index) including the basic materials sector. The empirical evidence presented shows that CSR has a neutral impact on the financial performance of these firms over a period of nine years. Similarly, Prihatiningtias & Dayanti (2014) assessed the same correlation for mining corporations listed on the Indonesian Stock Exchange between 2010 and 2012 using financial performance indicators, namely Return on Equity (ROE) and Cumulative Abnormal Return (CAR) using multiple regression tests, which resulted in a conclusion stating that the positive relationship between CSR and financial performance is not significant.

It is worth noting that some other studies take a different approach than focusing solely on the relationship between CSR and the financial performance of mining firms. For instance, using 43 interviews with several stakeholders engaged in CSR activities in the mining industry of Zambia, Phiri et al. (2018) examined the interactions of main stakeholders and CSR practices implemented in Zambian copper mining companies. The findings of the study show that there is an explicit power imbalance between civil society and mining firms, which is exacerbated by a number of factors, including conflicts among the primary stakeholders themselves. Furthermore, owing to the lack of a collective consensus for social and environmental frameworks and the eligibility of the leadership of stakeholders through transparency and accountability channels, critical cooperation at the local level is found to be challenging. Tackling this issue would ensure benefits to society and companies alike. Furthermore, mining companies can use frameworks that are tailored to their specific geographical operations criteria. This could help companies concentrate on critical CSR criteria to address business and social objectives simultaneously.

Implementing influential CSR activities requires obtaining a comprehensive plan. An appropriate framework for CSR initiatives consists of economic, social, and environmental concerns that should be straightforward with regard to execution and observation by all parties involved in the initiatives. From a sustainable development perspective, a well-designed CSR program can act as a starting point for understanding sustainability issues properly and acting upon them accordingly.

Given the focus of previous studies regarding the economic aspect of CSR in the mining industry, the researchers mainly studied the financial performance of the industry, particularly in Indonesia. In addition, studies have been conducted on a compilation of stock exchange companies. Our study is unique from the ordinary research line due to its concentration on the top mining companies in Europe and its extraction of the influential parameters related to decision-making. The reason for choosing European mining companies is obvious; As of 2019, the mining and quarry industry in the EU had a wage-adjusted labor productivity of 221.8% with a total of 48.7% turnover among the EU sectors for metal and non-metal mining companies (Eurostat, 2022). Table 1 represents key economic indicators for the EU.

Mining has always been seen as a detrimental activity to the environment and society, specifically in Europe due to the vast attention given to environmental preservation actions. Although mining companies have mostly declared their budgets and expenses for CSR activities, many communities around mining areas are reluctant about the net profit stemming from mining sites close by (Yang and Ho, 2019). Another argument is that mining can be a threat to the safety of nearby communities. For instance, mining activities (especially underground mining) can cause subsidence, which may result in damaging the local infrastructure and the environment (Sidki-Rius et al., 2022). In contrast to urban-based sectors such as IT, education, or healthcare, CSR initiatives in mining operations are different. Implementing CSR activities in mining may be viewed as a deceptive means of reducing the negative impact of its destructive nature, as on the one hand it is required to destroy natural intact lands, while on the other hand, the ultimate goal is to provide a better quality of life to society (Mutti et al., 2012).

The evident contribution of mining to national economies and social development is a pivotal pillar in some countries, such as Canada and Australia, to name a few (Parker and Cox, 2020; Sagebien et al., 2008). Knutsen et al. (2017) argue that bribery is increased by mining, as the comparison of an area before and after mining indicates, and it leads to local officials requiring more bribes. However, mining can be beneficial in the sense that it has a direct impact on the Human Development Index (HDI), corruption reduction, a stable political situation, accountability, the eradication of inequality, and the Gini coefficient (Ericsson and Löf, 2019). Mining has been an active component in decreasing the unemployment rate and providing vital materials to supply chains in other sectors. In some industries, there have not been other substances to replace those that have been exploited from ores, or the technology has not been up to the level to synthesize replaceable elements for them. Additionally, from a philanthropic standpoint, the efforts of the mining industry have been proven around the globe (Brown et al., 2006; Pozas et al., 2015; Lamb et al., 2017; Kumi et al., 2020). A concerning factor for the mining industry is that, given all its linkages to improving the quality of life and philanthropic actions, the relationship between the economic performance of firms and the aforementioned contributions is challenging to measure. As a result, being oblivious to the association between CSR and economic performance is not in favor of the managerial perspective of the mining industry, specifically in Europe. Therefore, by understanding the relationship between social activities and economic performance, more mining firms can be encouraged to get engaged in these sorts of initiatives.

Table 1
Key economic indicators for the mining industry in the EU (Eurostat, 2022).

Main Indicatorsa	Unit	Value
Number of enterprises (number)	Number	16,932
Number of people employed (number)	Number	392,246
Turnover	EUR million	86,394
Value Added	EUR million	33,055
Share in non-financial Business Economy Total		
Number of enterprises	%	0.1
Number of persons employed	%	0.3
Value added	%	0.5
Derived Indicators		
Apparent labor productivity	EUR thousand per head	84.3
Average personnel costs	EUR thousand per head	38
Wage-adjusted labor productivity	%	221.8
Gross operating rate	%	21.5

3. Theory and hypotheses

3.1. Corporate social responsibility: theoretical insights

Generally, there are five reasons why companies choose to implement and disclose CSR. They are aligned with the following (Jenkins, 2004).

1. Standards and regulations
2. Legitimacy theory
3. Public pressure from society and NGOs
4. Political economy theory
5. Stakeholder theory

Stakeholder Theory discusses the fact that a business has a wider range of beneficiaries besides its shareholders. Prioritizing shareholders over stakeholders can cause long-term issues for firms (Kumi et al., 2020). The initial traces of stakeholder theory go back to the Great Depression in the United States; It is argued that a corporation should benefit all its stakeholders, directly or indirectly (Freeman et al., 2010). CSR initiatives have been widely implemented as a proxy to reinforce the relationship between companies and all stakeholders, including society and the environment. We consider a positive correlation between stakeholder theory and CSR activities by mining firms that focuses on the responsibilities of mining companies toward their stakeholders. Understanding this link is critical because mining has a more prominent relationship with societal and environmental measurements than other sectors such as education. To clarify, mining operations can bring about issues for the local people living near the mine site, and at the same time, they impact the wildlife habitats, or the fauna and flora, which are silent stakeholders and may be neglected. Consequently, to cover a wider range of audiences in the mining industry, Stakeholder Theory is an acceptable approach to identifying the needs of the stakeholders and aligning them with CSR strategies.

Cesar (2019) defines Stakeholder Theory into three categories namely: instrumental, descriptive, and normative. The instrumental approach mainly focuses on the trust of stakeholders and its association with the company's revenue growth, and whether the engagement of stakeholders is beneficial to the firm. In the descriptive approach, the process of contemplating the interests of the stakeholders through the characteristics and behaviors of a firm. Finally, the normative approach explains the reasons why a company should consider stakeholders' interests. It could also be referred to as the "moral guidelines" of a company. All three approaches have an intertwined relationship as the normative approach in the core which is a part of the instrumental approach, and at last, the descriptive approach is a surrounding for the other two (Fig. 2).

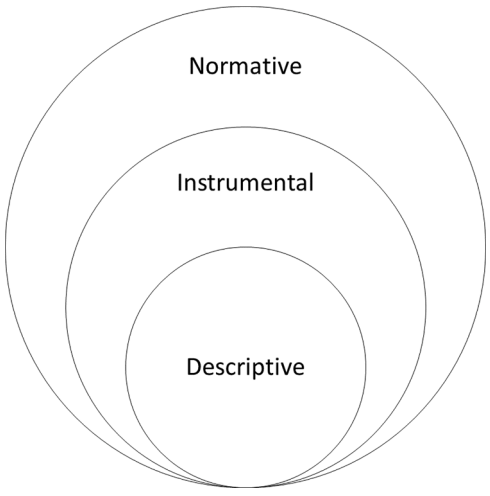

Fig. 2. Intertwined relationship of Stakeholder Theory approaches.

To maximize the positive effects of CSR activities on the firms and adopt strategies aligned with sustainable development, the resource-based theory might come in useful as a complementary framework to Stakeholders Theory. The resource-based theory argues that a firm can be considered a compilation of finite capabilities and limited resources. Due to the unique structure of each business, these resources are specific to it. Therefore, the theory discusses that a company can benefit more by concentrating on improving its resources rather than focusing on external competition (Branco et al., 2006). In the mining industry, utilizing resources for development purposes has two extremes; on the one hand, with regard to centuries of mining, South Africa has become an international region to provide mining services including equipment, while Niger and Sudan as the leading producers of Uranium and oil respectively have yet to struggle with sustainability issues. However, countries such as Angola, have been able to improve their economic classification, although not to a significant level (Kragelund, 2020). As a result, it could be concluded that CSR initiatives are proxies that mining firms can benefit from specifically for their competitive advantage.

The presented paper concentrates on the instrumental approach of Stakeholder Theory combined with the principle of resource-based theory to evaluate the impact of CSR on the economic performance of mining firms. Considering the prominence of CSR in mining, which has led to the establishment of several international entities and standards. The International Council of Mining and Metals (ICMM) and the Global Reporting Initiative (GRI) are some of these entities, to name a few. However, many firms are still hesitant to conduct more explicit CSR activities due to their doubt about the financial profit and economic benefit of CSR initiatives, and this subject has been more obvious in Europe due to the smaller size of mining companies. Taking into consideration that mining has a vital role in the economy of Europe (Eurostat, 2022), our study makes an effort to contemplate the process of the mining sector in Europe in tackling sustainability challenges that include communities and the environment. The advantage of this study can be noteworthy for mining firms as they can continue or become more involved in socially responsible activities with a more assertive economic viewpoint. Many individuals perceive mining companies' CSR initiatives as philanthropic gestures to improve the firms' reputation and image and not as a set of activities aligned with sustainable development goals for the benefit of stakeholders other than shareholders.

The procedure for our study has been adopted based on Jahmane & Gaies (2020) in order to investigate the economic performance of European mining companies in association with their CSR performances (ranking) based on the CSR Hub database. The goal is the correlation between CSR ratings and ranking with the economic criteria of a company so as to identify whether CSR rankings have a significant effect on the financial performance of the companies. The indicators used in their study to represent the financial performance are return on assets (ROA), return on equity (ROE), and Tobin's Q (TQ) with CSR data obtained from Thomson Reuters ASSET4/ESG and Thomas Reuters Datastream.

3.2. Research hypothesis

Based on the literature reviewed above, we can conclude that the outcome of the relationship between CSR and corporate financial performance has yet to be determined. The incongruency between the positive and negative outcomes of previous studies creates the need for a more reliable design for the study that could present the true economic performance of the company and not only the financial one. We incorporate financial indicators based on the market, revenue, profit, etc., and the efficiency of companies' inputs into the activity to examine how CSR activities affect the economic performance of firms in the mining industry of Europe. Therefore, our hypotheses are as follows:

Hypothesis (H1). CSR has a statistically significant impact on return on assets

ROA is a proxy to assess the financial performance of companies using the ratio of income to assets. Many studies, including Chen et al. (2021) provide evidence that CSR has a positive relationship with ROA as they investigate the relationship between institutional investors' visits to the site and CSR by examining 13,867 observations from the China stock exchange market from 2010 to 2018. ROA is calculated through the following equation as Eq. (1):

$$ROA = \frac{Operating\ Income}{Total\ Assets} \tag{1}$$

Hypothesis (H2). CSR has a statistically significant impact on return on equity

This hypothesis examines the relationship between return on equity (ROE) and CSR rankings. We hypothesize that there is an impact of CSR initiatives on the stock value of a firm. The choice of ROE for analysis aligns with a similar study by Liu et al. (2021) as it indicates the performance of a company in managing shareholders' invested capital in the company. The formula for ROA is depicted as Eq. (2).

$$ROE = \frac{Net\ Income}{Shareholder's\ Equity} \tag{2}$$

Hypothesis (H3). CSR has a statistically significant impact on net profit margin

Net profit margin (NPM) is a metric used to calculate a company's earnings after deducting all expenses (operating and non-operating) over the course of a fiscal year. Prior to this study, NPM was examined in studies such as Cho et al. (2019) in which CSR had a significant positive correlation with the net profit ratio. NPM is calculated as shown in Eq. (3).

$$NPM = \frac{Net\ Profit}{Net\ Sales} \tag{3}$$

Hypothesis (H4). CSR has a statistically significant impact on Tobin's Q

To validate the value of a firm, Tobin's Q ratio is used, which is the ratio of the total assets of the firm divided by its market value, see Eq. (4). Tobin's Q is distinctive from previous indicators due to its metrics, which are both market-based and accounting-based. Therefore, it is less prone to intentional or unintentional alteration by companies. It is shown that CSR has a positive effect on Tobin's Q ratio (Zhang and Cui, 2020).

$$Tobin's\ Q = \frac{Equity\ Market\ Value + Liabilities' Market\ Value}{Equity\ Book\ Value + Liabilities' Market\ Value} \tag{4}$$

Hypothesis (H5). CSR has a statistically significant impact on labor productivity

Hypothesis 5 investigates the statistical relationship between CSR initiatives and labor productivity, which is a ratio that measures the amount of output (product or service of a business) produced by each workforce. As labor productivity has positive impacts on economic growth (Kelani et al., 2019), it should be taken into consideration as an important player in the performance of companies, particularly with regard to CSR that is in direct contact with the workforce of a company. Moreover, a study by Newman et al. (2020) done on over 5000 Vietnamese enterprises, proved that socially responsible actions have a positive correlation with firm efficiency. Although there are various units for describing labor productivity from a psychological, social, and organizational behavioral standpoint, we have obtained the more economic unit, which is defined as revenue per employee (Nurmilaakso, 2009; see Eq. (5)).

$$Labor\ Productivity = \frac{Total\ Revenue}{Total\ Number\ of\ Employees} \tag{5}$$

4. Research models

To conduct this empirical study, financial data from companies between 2018 and 2021 were gathered. These data were obtained through the annual reports of the companies, available on the companies' websites. Among the 115 European mining companies listed on CSR Hub, a sample consisting of 181 samples was attained from 45 of the companies based on the firm requirements of the study, which aligns with the sample size of Samo & Murad (2019). The sample is chosen based on the age and total revenue of the firm, which is classified as medium and large mining companies with at least 500 employees and a yearly revenue of $50 million.

As companies are selected, procedures are conducted to calculate the return on assets, return on equity, net profit margin, Tobin's Q, and labor productivity. In terms of CSR indicators, CSRHub has developed a unique method for compiling CSR metrics from over 175 companies in five steps in order to rank and rate the companies in individual categories. First, the data is mapped to a central outline as the CSR performance of each company is placed within 16 subcategories aligned with 17 United Nations Sustainable Development Goals that fit into one of the four main categories, namely: Community, Employee, Environment, and Government. Next, the data undergoes the rating process on a 0–100 scale (100 being the full score). In the consequent step, comparisons of ratings from various CSR sources for each company are carried out to avoid any bias. As for step four, the weights for each adopted source are implemented to estimate the ratings for the appointed subcategories. Lastly, ratings that are not provided with adequate information are removed from the database.

The dependent variables are considered return on assets, return on equity, net profit margin, Tobin's Q, and labor productivity, whereas ratings for board, diversity and labor rights, energy and climate change, environment policy and reporting, human rights and supply chain, product, transparency and reporting, community development and philanthropy, training health and safety are indicators for independent variables. The data were run through two analyses to conduct the study. The characteristics of the variables were observed using correlation and descriptive analysis, and a statistically significant relationship between CSR and economic performance was identified using panel regression with a fixed and random effects model.

5. Results

5.1. Descriptive statistics

The descriptive analysis of the models consisting of independent and dependent variables for 180 observations is shown in Table 2.

The independent variables used in the study are board (BRD), diversity and labor rights (DVLBR), energy and climate change (ENCLC), environment policy and reporting (ENVPR), human rights and supply

Table 2
Summary of descriptive analysis.

Variables	Obs	Mean	Std. Dev.	Min	Max
ROA	180	8.116	9.042056	−10.14	41.79
ROE	180	0.126757	0.272947	−0.883508	0.971619
NPM	180	0.105817	0.155006	−0.3892	0.4821
TQ	180	0.700854	0.131076	0.19	0.951545
LP	180	2.896722	1.389760	1	5.77
BRD	180	55.81383	10.39826	24.5	79.46
CDPH	180	52.78067	9.053437	23.74	76.98
DVLBR	180	56.86078	11.1109	25.21	82.61
ENCLC	180	52.89122	10.20336	30.85	87.8
ENVPR	180	57.32356	9.276573	26.42	77.36
HRSC	180	53.77994	8.979924	25.3	86.25
PRD	180	46.36128	9.243523	20.88	66.55
THS	180	56.31417	10.88124	30	79.15
TRRP	180	54.42394	8.861774	33.25	82.02

chain (HRSC), product (PRD), transparency and reporting (TRRP), community development and philanthropy (CDPH), training health and safety (THS) to be used as a proxy to measure CSR performance using the ratings and rankings of CSRHub, while return on assets (ROA), return of equity (ROE), net profit margin (NPM), Tobin's Q (TQ), and labor productivity (LP) act as our dependent variables. Tobin's Q and ROA on average for European mining companies are approximately 70% and 7% respectively. Furthermore, labor productivity is 1.39 dollars per employee, which is in line with statistics presented by Eurostat (2022). Also, it can be seen that the ranking rates of the companies in CSR activities fluctuate in the range of 46 to 57.

5.2. Correlation analysis

The correlation matrix, which includes the correlation coefficients and statistical significance of the variables, is illustrated in Table 3.

Using the Pearson correlation test, CSR performance indicators have been analyzed. Although the maximum correlation found is almost 69, it is still considered a moderate correlation (Ratner, 2009). Therefore, no evidence of multicollinearity is found to bias the results of our study.

5.3. Hypotheses of the study

The hypotheses mentioned earlier are assessed using fixed-effects regression models as follows:

Hypothesis 1. There is a statistically significant relationship between CSR and return on assets

$$ROA_{it} = \alpha + \beta_1 BRD_{it-1} + \beta_2 CDPH_{it-1} + \beta_3 DVLBR_{it-1} + \beta_4 ENCLC_{it-1} + \beta_5 ENVPR_{it-1} + \beta_6 HRSC_{it-1} + \beta_7 PRD_{it-1} + \beta_8 THS_{it-1} + \beta_9 TRRP_{it-1} + \varepsilon_{it}$$

As can be seen from Table 4, CSR has a statistically positive impact on ROA. Out of 9 independent variables, training health and safety and product, with p-values of 0.0087 and 0.0211 respectively, have shown a statistically positive significant correlation with ROA, while community development and philanthropy with a p-value of 0.0118 is shown to have a negative relationship with the model. Also, the findings depict that the model is statistically significant at a p-value of 0.000 with an adjusted R^2 of 70.5% and F-statistics of 9.087. None of the other variables are associated with the model, and therefore, they do not have any effects on ROA. In addition, the Durbin Watson statistic value was found to be at 2.3717 which is less than 2.5000 meaning that there is no autocorrelation in the model in addition to the average VIF of 2.629 implying no multicollinearity for the model.

Hypothesis 2. There is a statistically significant relationship between CSR and return on equity

$$ROE_{it} = \alpha + \beta_1 BRD_{it-1} + \beta_2 CDPH_{it-1} + \beta_3 DVLBR_{it-1} + \beta_4 ENCLC_{it-1} + \beta_5 ENVPR_{it-1} + \beta_6 HRSC_{it-1} + \beta_7 PRD_{it-1} + \beta_8 THS_{it-1} + \beta_9 TRRP_{it-1} + \varepsilon_{it}$$

The relationship between ROE and CSR is tested in this hypothesis, which shows a significant relationship at a p-value of 0.000. The reliability of model is explained by a 68.3% adjusted R^2, and 8.288 for the F-statistics of the model. The p-values for statistically positive correlated variables are: diversity and labor rights (0.0294), product (0.0120), and training health and safety (0.0061), whereas that of the negatively correlated one is community development and philanthropy (0.000). The Durbin-Watson statistic value is 2.3985, which, together with the VIF value of 1.639, indicates that the model lacks autocorrelation and multicollinearity (see Table 4).

Hypothesis 3. There is a statistically significant relationship between CSR and net profit margin

$$NPM_{it} = \alpha + \beta_1 BRD_{it-1} + \beta_2 CDPH_{it-1} + \beta_3 DVLBR_{it-1} + \beta_4 ENCLC_{it-1} + \beta_5 ENVPR_{it-1} + \beta_6 HRSC_{it-1} + \beta_7 PRD_{it-1} + \beta_8 THS_{it-1} + \beta_9 TRRP_{it-1} + \varepsilon_{it}$$

This hypothesis evaluates the association between the net profit margin of the mining companies as a proxy for profitability and the CSR indicators as shown in Table 4. The model findings confirm the hypothesis due to the significant relationship between the dependent variable and the independent variables. Community development and philanthropy, with a p-value of 0.0059 indicating a negative effect, and training health and safety, with a p-value of 0.0152 indicating a positive influence, are the only influencing indicators. The rest of the variables have shown no statistical correlation with the independent variable. The explanatory coefficients of the regression model are a F-statistic of 5.8263, an adjusted R^2 of 58.8%, and a p-value of 0.000. The diagnosis of autocorrelation through the Durbin Watson statistic with a value of 2.106 shows no autocorrelation in the model. Also, the average VIF is 3.062 which mitigates the concern for multicollinearity.

Hypothesis 4. There is a statistically significant relationship between CSR and Tobin's Q

$$TQ_{it} = \alpha + \beta_1 BRD_{it-1} + \beta_2 CDPH_{it-1} + \beta_3 DVLBR_{it-1} + \beta_4 ENCLC_{it-1} + \beta_5 ENVPR_{it-1} + \beta_6 HRSC_{it-1} + \beta_7 PRD_{it-1} + \beta_8 THS_{it-1} + \beta_9 TRRP_{it-1} + \varepsilon_{it}$$

With a similar approach, hypothesis 4 investigate the influence of CSR activities on Tobin's Q as the indicator of the value of the firms. Using cross-section weights, the model introduces a statistical significance in the relationship between CSR and firms' value with a p-value of 0.000, adjusted R^2 value of 97%, and an F-statistics equal to 146.180. By analyzing the p-values of the indicators, it is shown that a handful of indicators affect the Tobin's Q. Interestingly, positively affecting indicators with their respective p-values are: human rights and supply chain (0.0429), transparency and reporting (0.0154), and training health and safety (0.0302), whereas the negative ones are: diversity and labor rights (0.0035), environment policy and reporting (0.000), and product (0.000). There is no multicollinearity due to the average VIF

Table 3
Correlation analysis,.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Board	1								
Diversity & Labor Rights	0.50162	1							
Energy & Climate Change	0.230137	0.378128	1						
Environment Policy & Reporting	0.387797	0.566759	0.668228	1					
Human Rights & Supply Chain	0.347331	0.556636	0.513201	0.580294	1				
Product	0.015104	0.339248	0.344178	0.378443	0.413159	1			
Transparency & Reporting	0.505082	0.592467	0.475878	0.592571	0.453359	0.313199	1		
Community Development & Philanthropy	0.28713	0.487033	0.449839	0.511236	0.54596	0.280072	0.258154	1	
Training Health & Safety	0.583299	0.626956	0.545003	0.651652	0.535529	0.263112	0.503038	0.698204	1

Table 4
The results of regression models.

Model	Method	Homoskedasticity Probability	*P*-Value	F-Statistic	Durbin Watson	Model VIF	Dependent Variables	T-Statistic	Independent Variables VIF
CSR - ROA	Panel Least Squares	0.1361	0.000000	9.087168	2.371725	2.629256	BRD	-0.527874	1.946962
							DVLBR	0.446596	2.285624
							ENCLC	-0.627504	2.088779
							ENVPR	0.747162	2.733272
							HRSC	0.164720	2.026165
							PRD	2.335086	1.370741
							TRRP	0.286991	2.165290
							CDPH	-2.553946	2.363615
							THS	2.664227	3.622555
CSR – ROE	Panel EGLS (Cross-section weights)	0.0024	0.000000	8.288150	2.398586	1.639702	BRD	-1.660389	1.946962
							DVLBR	2.202922	2.285624
							ENCLC	-1.615070	2.088779
							ENVPR	1.076323	2.733272
							HRSC	0.328847	2.026165
							PRD	2.549374	1.370741
							TRRP	-0.545854	2.165290
							CDPH	-4.853876	2.363615
							THS	2.788080	3.622555
CSR – NPM	Panel Least Squares	0.3807	0.000000	5.826305	2.106788	3.062477	BRD	-0.969795	1.946962
							DVLBR	-0.422767	2.285624
							ENCLC	-0.783466	2.088779
							ENVPR	0.297491	2.733272
							HRSC	0.620396	2.026165
							PRD	1.602872	1.370741
							TRRP	0.869494	2.165290
							CDPH	-2.801022	2.363615
							THS	2.461399	3.622555
CSR – TQ	Panel EGLS (Cross-section weights)	0.0000	0.000000	146.1806	1.925411	1.268880	BRD	-0.891019	1.946962
							DVLBR	-2.973543	2.285624
							ENCLC	-1.677931	2.088779
							ENVPR	-5.489522	2.733272
							HRSC	2.045597	2.026165
							PRD	-5.674941	1.370741
							TRRP	2.456617	2.165290
							CDPH	1.812382	2.363615
							THS	2.191847	3.622555
CSR – LP	Panel Least Squares	0.1110	0.000000	6.291273	2.479859	1.087171	BRD	-0.000308	1.946962
							DVLBR	0.013349	2.285624
							ENCLC	-0.014072	2.088779
							ENVPR	0.013831	2.733272
							HRSC	0.010398	2.026165
							PRD	-0.004066	1.370741
							TRRP	-0.009522	2.165290
							CDPH	-0.006849	2.363615
							THS	0.011952	3.622555

value of 1.268. The null hypothesis of autocorrection is rejected as the value of the Durbin Watson statistic is 1.9254 which can be found in Table 4.

Hypothesis 5. There is a statistically significant relationship between CSR and labor productivity

$$LP_{it} = \alpha + \beta_1 BRD_{it-1} + \beta_2 CDPH_{it-1} + \beta_3 DVLBR_{it-1} + \beta_4 ENCLC_{it-1} + \beta_5 ENVPR_{it-1} + \beta_6 HRSC_{it-1} + \beta_7 PRD_{it-1} + \beta_8 THS_{it-1} + \beta_9 TRRP_{it-1} + \varepsilon_{it}$$

As for the assessment of the effects of CSR on labor productivity, hypothesis 5 is tested with the following results: the model shows a statistically significant correlation with a p-value of 0.000. The adjusted R^2 for the model is 61% and the F-statistic = 6.2912 (see Table 4). According to Deng et al. (2020), none of the indicators have been shown to be statistically influential on labor productivity. No autocorrelation and multi-collinearity have been found, as the VIF for the model is 1.087 and the Durbin Watson statistic is 2.479.

6. Discussion

The models proposed in this study demonstrate that CSR has a positive impact on the economic growth of European mining companies to some extent. The findings of the study confirm the fundamentals of the theory discussed. By analyzing the results, it can be argued that the performance of European mining companies with regards to their CSR initiatives in health and safety along with product has had a major impact on their economic growth, while there is more room for improvement in their philanthropic activities and environmental reporting. By analyzing the results, it can be argued that the financial indicators of economic performance, such as the value of the firm and profitability, are more closely associated with labor productivity. The results of this study, as per reviewed in the literature, is unique and profound due to the fact that European mining industry has rarely been assessed in the subject of CSR. This paper contributes to the literature in line with that of Fadrul et al. (2021) and Nyeadi et al. (2018), despite the difference in the region of the targeted mining firms, as they have found a positive association between the CSR activities and the financial

performance of the companies. Furthermore, our findings can raise decision-makers' awareness by highlighting the strengths and weaknesses of mining firms' CSR initiatives.

It can be asserted that CSR is a decisive factor in the mining industry's management strategies, as it has a statistically significant association with the economic growth of firms. This implies that increased investment in CSR activities can result in improved firm performance. This study can be a remarkable contribution to the literature as it supports the evidence provided by previous researchers. The summary of the models for the five assessed hypotheses is represented in Table 5. Hypotheses 1 to 4 can be fully accepted, whereas hypothesis 5 can be partially accepted.

As the results indicate, return on assets and CSR have been found to be correlative, which means CSR can increase this indicator by applying the impactful initiatives, including training, health and safety, and product, and correcting the adverse ones, which are the philanthropic ones. Equally, it can be discussed that profitability and the return on equity have mainly been promoted through CSR by continuing their strategies on labor rights, their product(s), and health and safety, while altering their community development initiatives. Firms can focus on human rights and supply chains, transparency and reporting, and training to increase the value of the firm through CSR. In contrast, their decisions on diversity and labor rights, environment policy and reporting, and product should be improved. Regarding the productivity of the workforce, as the model shows a correlation with no impacting indicators, the hidden indicators might be the cause of this effect. From an executive standpoint, CSR initiatives can be divided into internal and external. Each category consists of several sub-categories and indicators that require more investigation. Companies' CSR criteria differ from those of mine sites (Bascompta et al., 2022). Companies with mutual objectives with ESG goals can have higher investment opportunities and are considered safer investment options due to their stronger CSR initiatives, which are considered a competitive advantage in their market. Therefore, it is more likely that another set of indicators might represent the correlation in greater detail.

7. Conclusion

The relationship between financial performance and CSR initiatives has piqued the interest of a large number of scholars, with varying results. The presented paper adds to previous research on the effects of CSR on economic growth (rather than just financial performance) for European mining companies. The extensive purpose of this study has been to investigate the relationship between CSR performance criteria and a number of indicators introducing the economic growth of the companies, namely return on assets, return on equity, net profit margin, Tobin's Q, and labor productivity.

The findings confirmed that there is a statistically significant association between economic growth and the CSR performance of the companies. Mining firms continually try to implement CSR initiatives so as to improve their reputation and increase their economic performance. Investors are more willing to invest in companies with solid management due to the better utilization of their economic resources to provide more profit. Given the ubiquitous concept of socially responsible investment, sustainability has become a decisive factor from an investor's viewpoint and should be considered prior to any extended or new investments as part of their responsibility. Companies with mutual objectives with ESG goals can have higher investment opportunities and are considered safer options for investment due to their stronger CSR initiatives, which are considered a competitive advantage in their market.

This study has contributed to previous studies regarding the correlation between CSR and the performance of companies, specifically in the extractive sector. One of the most notable aspects of this study is the identification of each impacting CSR indicator that is correlated with that of economics, which has revealed that mining firms in Europe have primarily performed well in terms of their products while their philanthropic actions have fallen short of expectations. The findings of this paper can be beneficial to scholars as well as industry experts in several ways, especially as they can be a consideration point regarding developing CSR programs and knowing which areas are more important to the economic return for the company. First, the paper suggests a new perspective to examine further the nexus of CSR and economic performance specifically for the mining industry, as the important CSR and economic criteria for each industry might be different. The second contribution of this study is to assess as many CSR indicators related to mining as possible. As a result, it can provide a clearer mind for instinctive selection of the indicators involving the initiatives.

Given the limitations regarding the association between CSR activities and the mining industry's economic growth in Europe, this study can complement the existing literature. Although the findings of the paper can be used in general terms for the mining industry, they may not be applicable to other extractive industries such as petroleum. Future studies can concentrate on introducing hidden criteria that mining firms can be aware of to maximize their CSR performance. Another interesting area of research could be a meta-analysis of recent studies about the mining industry and CSR to present a more comprehensive perspective and possibly more conclusive results. Furthermore, the period of this study was four years due to the missing data, which can be extended for future studies.

Table 5
Summary of the results.

Hypothesis	Test Performed	Outcomes
H1	CSR has a statistically significant influence on return of assets in mining companies	Accepted
H2	CSR has a statistically significant influence on return on equity in mining companies	Accepted
H3	CSR has a statistically significant influence on net profit margin in mining companies	Accepted
H4	CSR has a statistically significant influence on Tobin's Q in mining companies	Accepted
H5	CSR has a statistically significant influence on labor productivity in mining companies	Partially accepted

References

Abuya, W.O., 2016. Mining conflicts and corporate social responsibility: titanium mining in Kwale, Kenya. The Extractive Industries and. Society 3 (2), 485–493.

Abuya, W.O., Odongo, G., 2020. Poisoned chalice or opportunity for positive impact? an analysis of the impact of 'inherited'corporate social responsibility (CSR) commitments in Kenya's titanium mining industry☆. Extr. Ind. Soc. 7 (3), 1002–1010.

Akben-Selcuk, E., 2019. Corporate social responsibility and financial performance: the moderating role of ownership concentration in Turkey. Sustainability 11 (13), 3643.

Al-Ghazali, B.M., Sohail, M.S., Jumaan, I.A.M., 2021. CSR perceptions and career satisfaction: the role of psychological capital and moral identity. Sustainability 13 (12), 6786.

Azzone, G., Brophy, M., Noci, G., Welford, R., Young, W., 1997. A stakeholders' view of environmental reporting. Long Range Plann. 30 (5), 699–709.

Bascompta, M., Sanmiquel, L., Vintró, C., Yousefian, M., 2022. Corporate Social Responsibility Index for Mine Sites. Sustainability 14 (20), 13570.

Bhatia, A., Makkar, B., 2020. CSR disclosure in developing and developed countries: a comparative study. J. Glob. Responsib. 11 (1), 1–26.

Branco, M.C., Rodrigues, L.L., 2006. Corporate social responsibility and resource-based perspectives. J. Bus. Ethics 69 (2), 111–132.

Broad, R., 2014. Responsible mining: moving from a buzzword to real responsibility. Extr. Ind. Soc. 1 (1), 4–6.

Brown, W.O., Helland, E., Smith, J.K., 2006. Corporate philanthropic practices. J. Corp. Finance 12 (5), 855–877.

Cesar, S., 2019. Earning a social license to operate in mining: a case study from Peru. Resour. Policy 64, 101482.

Chen, X., Wan, P., Sial, M.S., 2021. Institutional investors' site visits and corporate social responsibility: implications for the extractive industries☆. Extr. Ind. Soc. 8 (1), 374–382.

Chetty, S., Naidoo, R., Seetharam, Y., 2015. The impact of corporate social responsibility on firms' financial performance in South Africa. Contemp. Econ. 9 (2), 193–214.

Cho, S.J., Chung, C.Y., Young, J., 2019. Study on the relationship between CSR and financial performance. Sustainability 11 (2), 343.

Chu, S.C., Chen, H.T., Gan, C., 2020. Consumers' engagement with corporate social responsibility (CSR) communication in social media: evidence from China and the United States. J. Bus. Res. 110, 260–271.
Corrigan, C.C., 2017. The effects of increased revenue transparency in the extractives sector: the case of the Extractive Industries Transparency Initiative. Extr. Ind. Soc. 4 (4), 779–787.
Dashwood, H.S., 2007. Towards sustainable mining: the corporate role in the construction of global standards. Multinat. Bus. Rev. 15 (1), 47–66.
Deng, X., Long, X., Schuler, D.A., Luo, H., Zhao, X., 2020. External corporate social responsibility and labor productivity: aS-curve relationship and the moderating role of internal CSR and government subsidy. Corpor. Soc. Responsib. Environ. Manage. 27 (1), 393–408.
Devie, D., Liman, L.P., Tarigan, J., Jie, F., 2019. Corporate social responsibility, financial performance and risk in Indonesian natural resources industry. Soc. Responsib. J.
Dobers, P., Halme, M., 2009. Corporate social responsibility and developing countries. Corpor. Soc. Responsib. Environ. Manage. 16 (5), 237–249.
Ericsson, M., Löf, O., 2019. Mining's contribution to national economies between 1996 and 2016. Mineral Econ. 32 (2), 223–250.
Esteves, A.M., 2008. Mining and social development: refocusing community investment using multi-criteria decision analysis. Resour. policy 33 (1), 39–47.
Eurostat, 2022. Mining and quarrying statistics - NACE Rev. 2. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Mining_and_quarrying_statistics_-_NACE_Rev._2 (Accessed: November 9, 2022).
Fadrul, F., Budiyanto, B., Asyik, N.F., 2021. The Effect of Ownership Structure and Corporate Social Responsibility on Financial Performance and Firm Value in Mining Sector Companies in Indonesian. Int. J. Econom. Develop. Res. (IJEDR) 2 (2), 92–109.
Fourati, Y.M., Dammak, M., 2021. Corporate social responsibility and financial performance: international evidence of the mediating role of reputation. Corpor. Soc. Responsib. Environ. Manage. 28 (6), 1749–1759.
Franco, S., Caroli, M.G., Cappa, F., Del Chiappa, G., 2020. Are you good enough? CSR, quality management and corporate financial performance in the hospitality industry. Int. J. Hosp. Manag. 88, 102395.
Frederiksen, T., 2019. Political settlements, the mining industry and corporate social responsibility in developing countries. Extr. Ind. Soc. 6 (1), 162–170.
Freeman, R.E., Harrison, J.S., Wicks, A.C., Parmar, B.L. and De Colle, S., 2010. Stakeholder theory: the state of the art.
Gorman, M.R., Dzombak, D.A., 2018. A review of sustainable mining and resource management: transitioning from the life cycle of the mine to the life cycle of the mineral. Resour. Conserv. Recycl. 137, 281–291.
Govindan, Kannan, Kannan, Devika, Shankar, K.Madan, 2014. Evaluating the drivers of corporate social responsibility in the mining industry with multi-criteria approach: a multi-stakeholder perspective. J. Clean. Prod. 84, 214–232.
Hitch, M., Barakos, G., 2021. Virtuous natural resource development: the evolution and adaptation of social licence in the mining sector. Extr. Ind. Soc. 8 (2), 100902.
Hsu, B.X., Chen, Y.M., Chen, L.A.L., 2022. Corporate social responsibility and value added in the supply chain: model and mechanism. Technol. Forecast. Soc. Change 174, 121302.
Ivic, A., Saviolidis, N.M., Johannsdottir, L., 2021. Drivers of sustainability practices and contributions to sustainable development evident in sustainability reports of European mining companies. Discover. Sustain. 2 (1), 1–20.
Jahmane, A., Gaies, B., 2020. Corporate social responsibility, financial instability and corporate financial performance: linear, non-linear and spillover effects–The case of the CAC 40 companies. Finance Res. Lett. 34, 101483.
Javed, M., Rashid, M.A., Hussain, G., Ali, H.Y., 2020. The effects of corporate social responsibility on corporate reputation and firm financial performance: moderating role of responsible leadership. Corpor. Soc. Responsib. Environ. Manage. 27 (3), 1395–1409.
Jenkins, H., 2004. Corporate social responsibility and the mining industry: conflicts and constructs. Corpor. Soc. Responsib. Environ. Manage. 11 (1), 23–34.
Ji, H., Miao, Z., 2020. Corporate social responsibility and collaborative innovation: the role of government support. J. Clean. Prod. 260, 121028.
Kahloul, I., Sbai, H., Grira, J., 2022. Does Corporate Social Responsibility reporting improve financial performance? The moderating role of board diversity and gender composition. Quart. Rev. Econ. Finance 84, 305–314.
Kelani, F.A., Odunayo, H.A., Ozegbe, A.E., Nwani, S.E., 2019. Health status, labour productivity and economic growth in Nigeria. J. Econ. Manage. Trade 1–12.
Kludacz-Alessandri, M., Cygańska, M., 2021. Corporate social responsibility and financial performance among energy sector companies. Energies 14 (19), 6068.
Knutsen, C.H., Kotsadam, A., Olsen, E.H., Wig, T., 2017. Mining and local corruption in Africa. Am. J. Pol. Sci. 61 (2), 320–334.
Kragelund, P., 2020. Using local content policies to engender resource-based development in Zambia: a chronicle of a death foretold? Extr. Ind. Soc. 7 (2), 267–273.
Kumala, R., Siregar, S.V., 2020. Corporate social responsibility, family ownership and earnings management: the case of Indonesia. Soc. Responsib. J.
Kumi, E., Yeboah, T., Kumi, Y.A., 2020. Private sector participation in advancing the sustainable development goals (SDGs) in Ghana: experiences from the mining and telecommunications sectors. Extr. Ind. Soc. 7 (1), 181–190.
Kvasničková Stanislavská, L., Pilař, L., Margarisová, K., Kvasnička, R., 2020. Corporate social responsibility and social media: comparison between developing and developed countries. Sustainability 12 (13), 5255.
Lamb, S., Jennings, J., Calain, P., 2017. The evolving role of CSR in international development: evidence from Canadian extractive companies' involvement in community health initiatives in low-income countries. Extr. Ind. Soc. 4 (3), 614–621.
Lin, W.L., Ho, J.A., Lee, C., Ng, S.I., 2020. Impact of positive and negative corporate social responsibility on automotive firms' financial performance: a market-based asset perspective. Corpor. Soc. Responsib. Environ. Manage. 27 (4), 1761–1773.
Liu, Y., Saleem, S., Shabbir, R., Shabbir, M.S., Irshad, A., Khan, S., 2021. The relationship between corporate social responsibility and financial performance: a moderate role of fintech technology. Environ. Sci. Pollut. Res. Int. 28 (16), 20174–20187.
Long, W., Li, S., Wu, H., Song, X., 2020. Corporate social responsibility and financial performance: the roles of government intervention and market competition. Corpor. Soc. Responsib. Environ. Manage. 27 (2), 525–541.
Maqbool, S., Zameer, M.N., 2018. Corporate social responsibility and financial performance: an empirical analysis of Indian banks. Future Bus. J. 4 (1), 84–93.
Mason, C.M., Paxton, G., Parsons, R., Parr, J.M., Moffat, K., 2014. For the benefit of Australians": exploring national expectations of the mining industry. Resour. Policy 41, 1–8.
Mbilima, F., 2021. Extractive industries and local sustainable development in Zambia: the case of corporate social responsibility of selected metal mines. Resour. Policy 74, 101441.
McMahon, Gary;, Moreira, Susana., 2014. The Contribution of the Mining Sector to Socioeconomic and Human Development. Extractive industries For Development series;no. 30. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/18660. License: CC BY 3.0 IGO.".
Mehahad, M.S., Bounar, A., 2020. Phosphate mining, corporate social responsibility and community development in the Gantour Basin, Morocco. Extr. Ind. Soc. 7 (1), 170–180.
Millington, R., Giles, A.R., Hayhurst, L.M., van Luijk, N. and McSweeney, M., 2019. 'Calling out'corporate redwashing: the extractives industry, corporate social responsibility and sport for development in indigenous communities in Canada. Appl. Sci. Med. Sport, [Pap. Annu. Meet. Can. Assoc. Sports Sci.], 6th, 22(12), pp.2122–2140.
Moon, H.K., Choi, B.K., 2014. How an organization's ethical climate contributes to customer satisfaction and financial performance: perceived organizational innovation perspective. Eur. J. Innov. Manage.
Mulhern, R., Mulhern, M. and Perreault, T., 2020. Contesting the social license to operate: competing visions and community exclusion on the Bolivian Altiplano. The Extractive Industries and Society, p.100803.
Mutti, D., Yakovleva, N., Vazquez-Brust, D., Di Marco, M.H., 2012. Corporate social responsibility in the mining industry: perspectives from stakeholder groups in Argentina. Resour. Policy 37 (2), 212–222.
Mzembe, A.N., Downs, Y., 2014. Managerial and stakeholder perceptions of an Africa-based multinational mining company's Corporate Social Responsibility (CSR). Extr. Ind. Soc. 1 (2), 225–236.
Mzembe, A.N., Meaton, J., 2014. Driving corporate social responsibility in the Malawian mining industry: a stakeholder perspective. Corpor. Soc. Responsib. Environ. Manage. 21 (4), 189–201.
Newman, C., Rand, J., Tarp, F., Trifkovic, N., 2020. Corporate social responsibility in a competitive business environment. J Dev Stud 56 (8), 1455–1472.
Nguyen, V.H., Agbola, F.W., Choi, B., 2022. Does corporate social responsibility enhance financial performance? Evidence from Australia. Australian Account. Rev. 32 (1), 5–18.
Nurmilaakso, J.M., 2009. ICT solutions and labor productivity: evidence from firm-level data. Electr. Comm. Res. 9 (3), 173–181.
Nyeadi, J.D., Ibrahim, M., Sare, Y.A., 2018. Corporate social responsibility and financial performance nexus: empirical evidence from South African listed firms. J. Glob. Responsib.
Orlitzky, M., Schmidt, F.L., Rynes, S.L., 2003. Corporate social and financial performance: a meta-analysis. Organiz. Stud. 24 (3), 403–441.
Pan, X., Sha, J., Zhang, H., Ke, W., 2014. Relationship between corporate social responsibility and financial performance in the mineral Industry: evidence from Chinese mineral firms. Sustainability 6 (7), 4077–4101.
Parker, R., Cox, S., 2020. The state and the extractive industries in Australia: growth for whose benefit? Extr. Ind. Soc. 7 (2), 621–627.
Partalidou, X., Zafeiriou, E., Giannarakis, G., Sariannidis, N., 2020. The effect of corporate social responsibility performance on financial performance: the case of food industry. Benchmark. Int. J. 27 (10), 2701–2720.
Phiri, O., Mantzari, E., Gleadle, P., 2018. Stakeholder interactions and corporate social responsibility (CSR) practices: evidence from the Zambian copper mining sector. Account. Audit. Accountab. J.
Pietrobelli, C., Marin, A., Olivari, J., 2018. Innovation in mining value chains: new evidence from Latin America. Resour. Policy 58, 1–10.
Pozas, M.D.C.S., Lindsay, N.M., du Monceau, M.I., 2015. Corporate social responsibility and extractives industries in Latin America and the Caribbean: perspectives from the ground. Extr. Ind. Soc. 2 (1), 93–103.
Prihatiningtias, Y.W., Dayanti, N., 2014. Corporate social responsibility disclosure and firm financial performance in mining and natural resources industry. Int. J. Account. Bus. Soc. 22 (1).
Ratner, B., 2009. The correlation coefficient: its values range between+ 1/− 1, or do they? J. Target. Measure. Anal. Market. 17 (2), 139–142.
Ruokonen, E., Temmes, A., 2019. The approaches of strategic environmental management used by mining companies in Finland. J. Clean. Prod. 210, 466–476.
Sagebien, J., Lindsay, N., Campbell, P., Cameron, R., Smith, N., 2008. The corporate social responsibility of Canadian mining companies in Latin America: a systems perspective. Canad. Foreign Policy J. 14 (3), 103–128.
Samo, A.H., Murad, H., 2019. Impact of liquidity and financial leverage on firm's profitability–an empirical analysis of the textile industry of Pakistan. Res. J. Textile Apparel.

Sharma, E., 2019. A review of corporate social responsibility in developed and developing nations. Corpor. Soc. Responsib. Environ. Manage. 26 (4), 712–720.
Shirasu, Y., Kawakita, H., 2021. Long-term financial performance of corporate social responsibility. Glob. Finance J. 50, 100532.
Sidki-Rius, N., Sanmiquel, L., Bascompta, M., Parcerisa, D., 2022. Subsidence management and prediction system: a case study in potash mining. Minerals 12 (9), 1155.
Sisto, Raffaele, López, Javier García, Quintanilla, Alberto, de Juanes, Álvaro, Mendoza, Dalia, Lumbreras, Julio, Mataix, Carlos, 2020. Quantitative analysis of the impact of public policies on the sustainable development goals through budget allocation and indicators. Sustainability 12 (24), 10583.
Siueia, T.T., Wang, J., Deladem, T.G., 2019. Corporate Social Responsibility and financial performance: a comparative study in the Sub-Saharan Africa banking sector. J. Clean. Prod. 226, 658–668.
Slack, K., 2012. Mission impossible?: adopting a CSR-based business model for extractive industries in developing countries. Resour. Policy 37 (2), 179–184.
Suopajärvi, L., Poelzer, G.A., Ejdemo, T., Klyuchnikova, E., Korchak, E., Nygaard, V., 2016. Social sustainability in northern mining communities: a study of the European North and Northwest Russia. Resour. policy 47, 61–68.
Tan-Mullins, M., Hofman, P.S., 2014. The shaping of Chinese corporate social responsibility. J. Curr. Chin. Aff. 43 (4), 3–18.
Trading Economics: Europe (The year 2021), 2022. Available at: https://tradingeconomics.com/country-list/gdp-from-mining?continent=europe (Accessed: October 24, 2022).
Trading Economics - September 2022 Data - 2001-2021 Historical, 2022. Available at: https://tradingeconomics.com/european-union/mining-production (Accessed: October 24, 2022).
Tsaurai, K., 2021. Mining, Poverty, and Income Inequality in Central and Eastern European Countries: what Do the Data Tell Us? Comparative Economic Research. Central and Eastern Europe 24 (3), 7–25.
United Nations Development Programme, 2016. Columbia Centre for Sustainable Development, United Nations Sustainable Solutions Network. World Economic Forum. Mapping Mining to the Sustainable Development Goals: An Atlas. White Paper. Available from: http://www3.weforum.org/docs/IP/2016/IU/Mapping_Mining_SDGs_An_Atlas.pdf. Accessed: 28 October 2022.
Uyar, A., Kilic, M., Koseoglu, M.A., Kuzey, C., Karaman, A.S., 2020. The link among board characteristics, corporate social responsibility performance, and financial performance: evidence from the hospitality and tourism industry. Tour. Manage. Perspect. 35, 100714.
Vintró, C., Comajuncosa, J., 2010. Corporate social responsibility in the mining industry: criteria and indicators. Dyna (Medellin) 77 (161), 31–41.
Vintró, C., Fortuny, J., Sanmiquel, L., Freijo, M., Edo, J., 2012. Is corporate social responsibility possible in the mining sector? Evidence from Catalan companies. Resour. Policy 37 (1), 118–125.
Wanvik, T.I., 2016. Governance transformed into corporate social responsibility (CSR): new governance innovations in the Canadian oil sands. The Extractive Industries and. Society 3 (2), 517–526.
Weber, O., Banks, Y., 2012. Corporate sustainability assessment in financing the extractive sector. J. Sustain. Finance Invest. 2 (1), 64–81.
Weber, O., Saunders-Hogberg, G., 2020. Corporate social responsibility, water management, and financial performance in the food and beverage industry. Corpor. Soc. Responsib. Environ. Manage. 27 (4), 1937–1946.
World Mining Data, World Mining Data - Data Section, 2022. Available at: https://www.world-mining-data.info/wmd/downloads/XLS/6.1.%20Total_World_Production.xlsx (Accessed: October 24, 2022).
Yang, X., Ho, P., 2019. Is mining harmful or beneficial? A survey of local community perspectives in China. Extr. Ind. Soc. 6 (2), 584–592.
Zainuddin Rela, I., Awang, A.H., Ramli, Z., Taufik, Y., Md Sum, S., Muhammad, M., 2020. Effect of corporate social responsibility on community resilience: empirical evidence in the nickel mining industry in Southeast Sulawesi, Indonesia. Sustainability 12 (4), 1395.
Zhang, Y., Cui, M., 2020. The impact of corporate social responsibility on the enterprise value of China's listed coal enterprises. Extr. Ind. Soc. 7 (1), 138–145.