



The effect of corporate social responsibility practices on real earnings management: evidence from a European ESG data

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Abstract

The new trend in the ranking of companies, not only in financial terms but also according to their commitment to ethics and corporate social responsibility (CSR), is explained by the importance of responsible investment and responsible governance criteria in the decision making of the shareholders and other investors. These new business evaluation criteria have attracted the attention of several stakeholders, such as investors, financial analysts, researchers, and also specialized media, that require quality information based on this social and ethical approach. The aim of this article is to examine the link between corporate social responsibility practices and the level of real earnings management (REM) of a sample firms belonging ESG index from five European countries. The variables related to the ethical behavior of companies have a statistically significant and negative relationship with the level of real earnings management. Indeed, the more important the socially responsible and ethical practices are, the less the company engages in an aggressive REM strategy. Thus, the integration of new dimensions in the explanation and determination of the REM is under-explored. The explanation of the quality of the results by ethical or social variables makes it possible to overcome the criticisms addressed to the contractual approaches of companies.

Keywords Corporate social responsibility · Ethical behavior · Real earnings management · Executive incentive compensation · Environmental, social and governance (ESG)

Introduction

The link between corporate social responsibility (CSR) or sustainable development and corporate finance has gained momentum in the context of investment and corporate financial strategies. The integration of sustainable development objectives or actions carried out within the framework of CSR or even business ethics have completely upset the reality of companies by moving from a classic vision, which considers that the company is a black box, to a pluralist vision that is more open to the environment and society in its different acceptances (Christ et al. 2017). Furthermore, the shift in sustainable development from the traditional industrial development model has serious consequences for

companies and their integration into society (Gramlich and Finster 2013).

Thus, taking environmental, social, or corporate governance factors into account is gradually established as a central criterion in investment and financing decisions. This societal rating market has developed rapidly, with the increasing maturity of prevalent specialized funds covering all asset classes. The international acronym ESG (Environmental, Social, and Governance) is used by the financial community to designate the environmental, social, and governance criteria, which generally constitute the three pillars of socially responsible investment and extra-financial analysis (taking into account the ESG dimensions).

Ethical stock market indices, such as ESG, are based on the high performance of companies in terms of sustainability. The criteria for composing these indices are based on the environment and the degree of the company's involvement in illegal activities, namely the arms trade, nuclear energy, and the company's degree of commitment to CSR practices. In this regard, CSR is mainly perceived as an excellent tool to strengthen the legitimacy of the company with its stakeholders and the development of a real picture

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of what is happening within it (Arslanagic-Kalajdzic et al. 2017; Alipour et al. 2019; Sial et al. 2018).

As part of this work, we sought to study the association between the ethical behavior of companies and the real earnings management of companies belonging to the ESG index more deeply. In this regard, shareholders who have a short-term vision refuse to engage in this process of business ethics as it is costly and less profitable for them. Indeed, executives could use investments in business ethics to expand their discretionary space and manipulate the accounting bottom line. Besides, institutional investors may object to these investments because of their uncertain returns. Likewise, it is a bit difficult for shareholders to detect accounting manipulation involving responsible investment activities, especially when the company performs well (Le et al. 2020).

According to Bergh et al. (2019), managers who are assumed to be opportunistic can take advantage of their informational advantage over other different users to maximize their well-being to the detriment of external parties. Similarly, executives take advantage of the asymmetry of information vis-à-vis shareholders while managing the firm's earnings up or down. In this sense, they can intervene in the formation of accounting results through choices related to investment, financing, and operating decisions. Also, managers develop strategies that are difficult to observe, thus making their replacement costly and increasing their power in the firm (Shleifer and Vishny 1989).

The question that arises concerns the merits of these accounting choices in a company that attaches great importance to socially responsible investment projects, which are valuable but risky and represent a source of conflicts between the company's partners. These projects are considered as a means to sustainably survive the business process (OECD 2005). However, it is noted that managers can influence the success of investment projects in CSR or business ethics through their accounting choices in this area. This phenomenon can be described under the concept of real earnings management. The study of earnings management is part of research in the positive theory of accounting, which concerns the analysis of the accounting choices observed within companies. Besides and in a broader vision, the manager can play a decisive and active role in the development of the company's investment policy and strategy through accounting choices (Stata 1989; Dooley and O'Sullivan 2003; Kim et al 2019).

Things get more complicated in a framework of theoretical analysis based on the integration of new tools for the financial evaluation and analysis of firms. This is where the behavior of the manager and his characteristics are addressed in relation to accounting choices concerning CSR or ethical investment projects which pose problems of control, governance, and evaluation.

In this regard, Prior et al. (2008) and Gargouri et al. (2010) report that companies whose managers adopt aggressive earnings management policies are more likely to engage in ethical and social policies to mislead the shareholders. A plausible explanation for this positive association is that managers want to gain the support of stakeholders and reduce the risk of dismissal that may be caused by the negative effects of earnings management practices on the value and reputation of the company. Cespa and Cestone (2007) point out that perceived commitment to CSR could help ensure a strategic position for the company.

Prior et al. (2008) show that CSR is often implemented as a defensive tool to avoid the negative reactions and subsequent oversight from stakeholders that could be affected by earnings management practices, thus strengthening the position of managers in the company and allowing them to keep maximizing their interests (Surroca et al. 2010). The possibility that CSR can be used as a protection or neutralization strategy to reduce the negative reaction to real earnings management practices will raise several questions. It follows that the central question of this work is as follows: How can the company's commitment to business ethics and CSR influence the extent of real earnings management?

The aim of this article is to examine the link between corporate social responsibility practices and the level of real earnings management (REM) of a sample firms belonging ESG index from five European countries.

To test the study's hypotheses, we applied linear regressions with panel data using the Thomson Reuters ASSET4 database from five countries to analyze data from 557 listed companies selected from the ESG index between 2010 and 2019. The empirical results indicate a growing interest in CSR and ethical practices to explain and reduce the scale of real earnings management and so improve the quality of information and make companies more transparent. This is useful for those who frequently use financial reports, especially investors who look for profitable investment opportunities. The contribution of this study lies in the fact that the reading and the analysis of the component of earnings management differ between the contractual approach and the ethical behavior of the company. Thus, the integration of new dimensions in the explanation and determination of real earnings management remains under-studied. The explanation of the quality of the results by ethical or societal variables makes it possible to overcome the criticisms addressed to the contractual approaches of companies. It is, therefore, a matter of achieving a better understanding of the modes of conceptualization and thinking related to the problems of accounting choices affecting the quality of financial information.

The remainder of this article is organized as follows. The following section will develop the theoretical framework and the review of the literature to identify the research



hypotheses. The adopted research methodology will be outlined in the “[Research methodology](#)” section. The results are presented and discussed in the “[Results and discussion](#)” section. Finally, the “[Robustness checks](#)” section will present the conclusions as well as the limitations of the research.

Literature review and theoretical foundations

The problem addressed in this article relates to the impact of the ethical behavior of companies on the real earnings management of companies belonging to the ESG index. The answer to this question requires to present, first of all, earnings management within the framework of business ethics, then we try to outline the theoretical framework which allows valuing the consequences of the adoption of a societal and ethical approach. Finally, we will develop the hypotheses on the impact of the ethical behavior of companies on real earnings management.

Earnings management within the framework of business ethics

The environment of the firm has undergone a complete change over the past decades following financial scandals, such as Enron in the USA, France Telecom and Vivendi Universal in France, Parmalat in Italy, Batam in Tunisia, as well as the bankruptcy of the financial group Lehman Brothers in September 2008. Faced with such a situation, managers are encouraged to manage this risk of failure to guarantee the sustainability of their companies. In this respect, several authors emphasize the importance of accounting results as an indicator of performance and good management for the various partners of the company. As a result, managers sometimes find themselves obliged to intervene in the presentation of accounting and financial information to publish accounting figures that motivate the partners in their companies and reduce the risks to which they are exposed. This phenomenon is called earnings management.

In this sense, accounting literature mainly distinguishes two methods of results management. The first corresponds to the management of accounting results via accruals, also known as accounting results management, which has been widely studied in the accounting literature since the 1980s, as researchers generally consider it more difficult for managers to play on real flows (Schipper 1989; Healy and Wahlen 1999). This first modality corresponds simply to any earnings management practice based on the discretionary spaces left by accrual-based accounting for the benefit of managers. These spaces are mainly in the form of a set of options (stock valuation, depreciation, etc.) or accounting valuation (provision for risk, provisioning rate on trade receivables, etc.).

The second modality of results management is called real earnings management. This modality has received enormous attention in the accounting literature since the study of Roychowdhury (2006). These authors point out that the involvement of the management team in the earnings management process can occur not only through accounting estimates or accounting policy choices but also through operational decision making. Indeed, Roychowdhury (2006) mainly distinguishes three practices based on operating activities, namely production management, reduction of discretionary expenses, and sales management. Although real earnings management is a newly explored theme in the literature, several recent studies have addressed it by studying its relationship with governance mechanisms and accounting income thresholds (Sellemi and Adjaoud 2010), and the cost of bonds (Ge and Kim 2014). Recent studies have investigated the effect of REM on firm performance (Cohen and Zarowin 2010; Zang 2012), and most of these studies have taken return on assets (ROA) as a performance index of the firm. Others have focused on the relationship existing between the real earnings management and the management of accruals (Matsuura 2008; Sanjaya and Saragih 2012).

According to the “myopia avoidance hypothesis” (Chih et al. 2008), CSR-oriented companies are less likely to manipulate earnings because they are intrinsically more committed to their institutional role (creating value for shareholders) and their more transparent disclosure policies.

Thus, the main argument is that CSR induces transparency and reduces the propensity for the number of earnings management opportunities. Besides, there is empirical evidence that there is a negative relationship between CSR and earnings management, with few exceptions.

On their part, Chih et al. (2008) studied the association between CSR and earnings management using a large sample of international companies over the period 1993–2002. They found that CSR is associated with less smoothness and more aggressiveness with profits (moderated by the institutional environment) and less loss of profit, thus providing mixed evidence to support alternative theories.

Calegari et al. (2010) relied on the work of Prior et al. (2008), who argue that managers use CSR to reduce the likelihood of being reviewed by satisfied stakeholders. According to this view, CSR is “the result of a principal-agent problem where the manager is an agent who uses CSR as a tool to maximize his own benefits” (Calegari et al. 2010).

Moreover, Calegari et al. (2010) argue that CSR could become part of the corporate culture and, therefore, becomes established within a company regardless of the agency problem. Using a sample of US companies from 1991 to 2008, they noticed that CSR improves quality, contradicting the results of previous studies. In a related study, Litt et al. (2014) provided further evidence that companies with environmental initiatives display weaker earnings management



represented by absolute total discretionary provisions and increases revenues. Also, these authors have noted that pollution prevention and climate-related initiatives help explain this reverse association. For their part, Hong and Andersen (2011); Kim et al. (2012) and Faisal et al (2018), also extended the literature on the relationship between corporate social responsibility and real earnings management.

Furthermore, previous literature has shown that companies are more likely to engage in the least detectable but most expensive real earnings management strategy when the level of control is high (Cohen and Zarowin 2008; Zang 2012). Indeed, we extend this literature by examining whether the company's CSR orientation plays a role in shaping the company's attitude toward a less detectable but more expensive real earnings management strategy in the presence of a strict legal enforcement environment.

The theory of legitimacy: a relevant analysis framework for measuring and valuing socially responsible practices

Previous literature has shown that several theories could be used to explain our problem. Indeed, the supposed theoretical relationship between the ethical behavior and real earnings management can be explained relying on several theoretical corpora, namely the agency theory, the signaling theory, the legitimacy theory, and the stakeholder theory. Nevertheless, as part of this work, we mobilized the theory of legitimacy, which allows broadening the stakeholder theory, based on the argument that corporate social responsibility is focused not only on the needs and alignment of stakeholder interests but also on principles consistent with a system of socially constructed norms, values, and beliefs (Gray et al. 2009). Positive CSR strategies foster a climate of legitimacy and support among regulators and stakeholders. They also deter activism and interest group intervention and increase job satisfaction and customer loyalty (Hong and Andersen 2011; Scholtens and Kang 2013).

Dendler (2014) believes that legitimacy plays a crucial role in deepening the institutionalization of product labeling systems and the alignment between consumption and production systems. Thus, the decision making depends on the legitimacy in question. According to the legitimacy theory, the organization and the society are inseparable because there is congruence between the behaviors of the organization and the shared and supposed beliefs of the relevant social groups. Moreover, this theory assumes that legitimacy is "objectively possessed but subjectively created" (Suchman 1995). Market forces and community expectations are factors that determine the survival of an organization (Che-Ahmad and Osazuwa 2015). Thus, the organization must act in accordance with what might please the company to maintain its long-term existence.

Development of research hypotheses

The objective of this research was to test the effect of the ethical behavior of companies represented by the company's commitment to corporate social responsibility, business ethics, and executive incentive compensation on real earnings management.

The effect of corporate social responsibility on real earnings management

It has been documented in the literature that taking corporate social responsibility into account is considered an incentive that could induce or discourage the use of earnings management. Thus, corporate social responsibility can be defined in several ways. In this sense, Dahlsrud (2008) collected 37 different descriptions of this concept that are consistent with reference to five dimensions to which corporate social responsibility is linked, such as the stakeholder dimension, the social dimension, the economic dimension, the volunteering dimension, and the environmental dimension.

Overall, the main objective of corporate social responsibility is to contribute to the value of society combined with the value of the business. In this context, Malik (2015) proved that socially responsible companies act responsibly in the preparation of their financial reports. Corporate social responsibility is expected to positively contribute to a company's ethics, reputation, financial performance, and stakeholder relations (García-Sánchez and García-Meca 2017). The objective of corporate social responsibility is to make the financial reports transparent and of high quality and that they are useful for the decision making (Salweski and Zülch 2014).

Several researchers, including Bozzolan et al. (2015), found results consistent with this perspective by highlighting how corporate social responsibility adds value to the business. They also proved that the annual financial report is a constraining factor on the use of real earnings management, and hence, they ensure the preservation of the business value. Since it is proven that the use of real earnings management would be the basis of the long-term performance of the company, while corporate social responsibility activities are positively related to performance, companies with high-quality corporate social responsibility reporting are less likely to engage in real earnings management (Bozzolan et al. 2015).

Finally, as previous literature has documented that corporate social responsibility discourages real earnings management (Hong and Andersen 2011; Kim et al. 2012), the level of real earnings management might simply be low overall, and therefore their tradeoff is naturally less significant. Nevertheless, we argue that corporate social responsibility will discourage real earnings management to a different degree



by confirming the findings of previous work that corporate social responsibility -oriented companies are less likely to manipulate profits through the use of real earnings management (Orlitzky et al. 2003).

Moreover, Pyo and Lee (2013) conducted a study in South Korean companies and found that those engaged in social responsibility (measured as spending on donations) were less likely to engage in earnings management through discretionary regularizations. Furthermore, in an international study covering 24 countries, Bozzolan et al. (2015) noted that social responsibility activities were a constraint for real earnings management but not for accruals. This is explained by the fact that real earnings management has a negative impact on the future financial performance of the firm and that companies oriented toward social responsibility seek to avoid adopting real earnings management based on real activities. This also suggests some support for the ethical hypothesis. Indeed, companies focused on social responsibility were less likely to engage in real earnings management, which could adversely affect a company's future financial results.

Moreover, several previous studies have shown that institutional factors influence the relationship between corporate social responsibility activities and earnings management. In a study of companies in 26 countries, Martínez-Ferrero et al. (2016) found that, as expected, corporate social responsibility had a positive effect on the company's cost of capital. Interestingly, the favorable effect was most pronounced in companies where earnings management was detected. This indicates that stakeholders are unable to identify real earnings management manipulative practices when corporate social responsibility is used to "launder" earnings management.

Nevertheless, the relationship between corporate social responsibility and earnings management is a bit ambiguous; therefore, the results of previous studies are mixed and do not show consistency. Indeed, these studies have shown that the level of earnings management is lower when companies publish reports on corporate social responsibility (Gras-Gil et al. 2016; Scholtens and Kang 2013). However, Martínez-Ferrero et al. (2016) have shown that corporate social responsibility can be more favorable on the cost of capital for companies that use earnings management. Moreover, Hoi et al (2013) has shown how corporate social responsibility activities are linked to aggressive real earnings management practices. Kim et al. (2012) noted that differences in the use of earnings management could potentially be found in differences between countries rather than just corporate social responsibility activities. Also, Hong and Andersen (2011) found that American companies that are considered to be socially responsible are less likely to manage their profits. Based on stakeholder theory, the following hypothesis is developed:

H1 Socially responsible companies are less likely to engage in real earnings management than companies that are less socially responsible.

The effect of business ethics on real earnings management

The basic definition of ethics consists of standards defining what is good or bad conduct (Mihelic et al. 2010). Ethics is then defined in an active and positive sense rather than the passive sense of ethics, defined as mere compliance with the written code.

Interestingly, the ethical assumption states that managers are encouraged to be ethical, honest, and transparent in their financial reporting and to be socially and environmentally responsible in their activities. If the stakeholders believe that earnings are managed or that a company is not socially responsible, the affected company could lose value in the market. Therefore, a study by Turyakira et al. (2014) found a positive effect between corporate social responsibility activities and the competitiveness of small and medium-sized enterprises. Furthermore, Martínez-Ferrero et al. (2016) suggest that CSR can improve the company's reputation and reduce the cost of capital, while earnings management reduces reputation and increases the cost of equity.

Moreover, the concept of reliability requires managers to be impartial in their accounting and reporting decisions and this is where earnings management is hampered by an ethical perspective. Although there are ethical implications in managing earnings, business executives report more to maintain credibility with the capital market, protect stock prices, and improve the company's reputation with stakeholders (Graham et al. 2005).

Several analytical studies suggest that the current shareholders of a company may require earnings management to positively influence the value of the company (Dye 1988). Given these benefits, investors may perceive earnings management as appropriate and ethical behavior. The potential economic benefits of earnings management and the negative effect of earnings management on the reliability of accounting information create empirical tension for examining the ethics of earnings management.

Furthermore, short-term profits are managed in most, if not all, businesses. Earnings management can, therefore, be defined as any management action affecting reported income but having no real economic benefit to the organization, even though it may be detrimental to the business in the long run (Merchant and Rockness 1994).

Previous studies have shown that CSR information is associated with earnings management. Thus, Martínez-Ferrero et al. (2016) found a positive relationship between conservative accounting practices and the extent to which managers disclose their CSR information following the Global Reporting Initiative (GRI) recommendations. They



argue that managers incentivized to reduce information asymmetry will minimize earnings management and disclose more CSR information to shareholders. In the same vein, Chen et al. (2016) found that companies engaged in the process of improving the quality of financial reporting, and indirectly represented by the payment of audit fees, are more likely to publish CSR reports voluntarily.

If so, one can expect a negative relationship between CSR reporting and earnings management. The ethical argument suggests that managers of socially responsible companies are encouraged to make responsible operating and reporting decisions and thus limit earnings management. This argument is consistent with ethical, political, and integrative theories of CSR (Garriga and Mele 2004). However, the opportunistic argument suggests that managers use CSR activities opportunistically to conceal negative information about the company. In this case, managers of socially responsible companies are more likely to engage in earnings management, which is consistent with instrumental theories. However, the empirical evidence is mixed. In this sense, Chih et al. (2008) have shown that socially responsible companies are more likely to engage in real earnings management practices, which supports the opportunistic argument. Likewise, Prior et al. (2008) and Martinex-Ferrero et al. (2016) reported that companies strategically use CSR activities to protect themselves against negative perceptions of earnings management. For their part, Hong and Andersen (2011) and Kim et al. (2012) found that socially responsible companies are less likely to engage in earnings management, supporting the ethical argument. Based on these arguments, our second hypothesis is formulated as follows:

H2 Companies that are most committed to ethics are less involved in the REM.

CSR-linked executive compensation and REM

According to a study of Derchi et al. (2020), it has been shown that the use of executive compensation linked to corporate social responsibility goals on a sample from 746 US firms listed companies for the period 2002–2013 promotes CSR performance. Numerous studies focused on the relationship between managerial characteristics and earnings management and attempted to find what kinds of managers are more likely to manage earnings. All these prior studies indicated that managers engage in earnings management to maximize their total pay because most firms have earnings-based executive compensation contracts. In this paragraph, our question is to ask what effect CSR ratings have on levels of earnings management at firms with CSR-contracted executives versus those without.

The executive's compensation systems include salaries, annual bonuses, and long-term incentives. However, these

remuneration systems do not explicitly include incentives related to the dimensions of sustainable development. The results of previous studies show that salaries and incentives linked to long-term objectives lead to poor social and environmental performance (Li and Thibodeau 2019). As a result, the company's incentive remuneration policy is subject to several constraints and conflicting objectives, with short-term financial objectives being overshadowed. Longer-term use of CSR-linked executive compensation also means firms accumulate considerable experience, reaping economic benefits (Derchi et al. 2020). As a result, the manager's incentive compensation is a mechanism used by the company to encourage the manager to be responsible for applying the rules of good conduct, and to strengthen corporate social responsibility practices. To avoid executives using CSR engagement as a safety net for their misbehavior, the boards either need to monitor the executives more closely or provide proper incentives to compensate them for achieving the company goals (Li and Thibodeau 2019). Executives respond to these incentives by working harder and better and refraining from unethical activities. Therefore, we should observe that executives with CSR contracts are less likely to manipulate earnings. This leads us to formulate the third hypothesis (H3) which is presented as follows:

H3 The executive compensation that is linked to the sustainable development objectives has a negative impact on the REM.

Research methodology

In this section, we will test the developed hypotheses in order to detect the effect of the ethical behavior of companies on the real earnings management by companies belonging to the ESG index. In what follows, we will describe the sample, the data sources, and the research model.

Sample selection and data collection

Our study investigates the impact of firm's engagement in CSR practices on the level of real earnings management of sample firms belonging ESG index from five European countries. The choice of the sample was conditioned by the commitment and involvement of companies in the ESG process. We employ the database of DataStream ASSET4 which provides information on CSR for listed firms from 210 countries.

The initial sample selection involved downloading information on ESG companies from five European countries for the period spanning 2010–2019 is a 1402. Firms with unavailable data were excluded from the sample (413). Moreover, firms with missing data were excluded



from the original sample (346). In addition, after filtering our data to exclude financial firms, banks, and insurance companies, because they are subject to regulatory supervision affecting their governance systems, we obtained a final sample of 557 totaling 5557 firm-years observations.

The sample composition shown in Table 1 reflects that most CSR reporting companies are from larger economies such as Germany and France. That can be explained by the simple fact that large advanced countries tend to be home to many companies. Because of mandatory CSR reporting practices, even though having a considerably smaller economy, Sweden is also well represented. Not represented at all are companies exchanged within the east European countries that seem to have weak CSR reporting traditions, just like what Arraiano and Hategan (2019) suggest. Moreover, when conducting study in Business administration, some researchers resort to excluding the UK. The reason often given is that the kingdom has an accounting system that is vastly different from the continental countries (Hartwig 2018). Panel A of Table 1 describes the sample selection, Panel B provides the distributional properties of the full sample by country, and Panel C presents sample distribution by industry.

Variables description

Dependent variable: real earnings management

In order to measure the extent of REM, we follow Cohen et al. (2008) who are based on Roychowdhury (2006)'s work. As part of the present work, detection of the real earnings management index (REMI) was based on the sum of abnormal operating cash flows (AbnCFO), abnormal production costs (AbnPR), and abnormal discretionary expenses (AbnDE). Thus, we started by estimating the normal level of cash flows as emanating, respectively, from operations, production costs and discretionary expenditures by performing the following regression models relevant to each year per industry. The second step calculates abnormal operating cash flows, abnormal production costs, and abnormal discretionary spending. The latter correspond to the difference between the actual values of these variables and their normal values. The third step is building an index of the REM that combines the three proxies.

In order to have a comprehensive metric and capture the total effect of real earnings management, we aggregate the three measures of real manipulation activities into one proxy, REMI, by taking their sum as follows (Cohen et al. 2008; Cohen and Zarowin 2010 and Zang 2012): $REMI = (-1) * AbnCFO + AbnPR + AbnDE * (-1)$.

It should be noted that the detail of the measurement of this variable can be found in the "Appendix".

Independent and control variables

In what follows, we will present the measurement of the independent variables of this study, namely CSR, the ethical behavior of firms, and the CSR-linked executive compensation.

Corporate social responsibility ("CSR_SCO") CSR score was drawn from the ASSET4 database by using the Environmental, Social, and Governance (ESG) score. Following the study by Cheng et al. (2016), Wang et al. (2018) and Escrig-Olmedo (2019), the ESG scores are used to measure the variable corporate social responsibility. ESG stands for environmental, social and governance, which are three pillars used as proxy for CSR. As mentioned, the data was obtained from ASSET4, a database within Thomson Reuters DataStream. The environmental, social and governance (ESG) information is based on more than 250 key performance indicators and more than 750 data points. The CSR proxy in this research is the average of the environmental score, the social score and the corporate governance score. The ASSET4 database provides a firm's weighted CSR score. This score is based on a defined set of weighted data points for each CSR dimension (environmental, social and governance) according to their importance. CSR score can have a value that varies between 0.1 and 100 for firms that fits, respectively, with a minimum level of and all Thomson Reuters's data points requirements. A higher CSR score corresponds to a better CSR. In our analysis, we measured corporate social responsibility "CSR_SCO" by a score determined and calculated by the ASSET4 database to ensure comparability between companies.

The ethical behavior of the company ("ETH_SCO") Several academic studies suggest that there are many benefits to acting ethically, such as improving the financial and non-financial performance of companies (Verschoor 1998) and creating a sustainable competitive advantage (Azmi 2006).

In this study, we adopted a measure developed by ASSET4 to measure the ethical behavior of companies. It consists of a series of items that evaluate the company's ethical performance objectively and its compliance with professional ethical standards. Indeed, it is a composite score calculated on the basis of a combination of several items reflecting the ethical principles applied by each company.

The CSR-linked executive compensation ("CSR_COMP") As discussed in the literature review, most studies decompose CSR-Linked Executive Compensation into social and performance scores. In this study, we will adopt a measure developed by ASSET4 to measure CSR-Linked Executive Compensation. We used the variable "Compensation Policy/Sustainability Compensation Incentives" from ASSET4 to proxy for a firm's choice to tie Named Executive Officers' (NEOs) compensation to CSR Sustainability targets. Specifically, we created the binary indicator



Table 1 Sample selection and breakdown by country and industry

Sample	# Firms	# Obs	
<i>Panel A: Sample selection</i>			
Initial sample	1402	14,020	
Companies with lack of total data	(413)	(4130)	
Firms with missing data	(346)	(3460)	
Banks and financial institutions	(86)	(860)	
Final sample	557	5570	
Country	Number of firms	# Obs	%
<i>Panel B: Sample distribution by country</i>			
France	154	1540	27.64
Denmark	44	440	7.89
Sweden	147	1470	24.45
Spain	58	580	26.39
Germany	154	1540	27.64
Total	557	5570	100
Industry	# Observations	%	
<i>Panel C: Sample distribution by industry</i>			
Aerospace and defense	155	2.78	
Alternative energy	132	2.36	
Automobiles and parts	158	2.83	
Equity investment instruments	190	3.41	
Forestry and paper	112	2.01	
Mobile telecommunications	190	3.41	
Beverages	161	2.89	
Chemicals	185	3.32	
General industrials	143	2.56	
Real estate investment and services	127	2.28	
Construction and materials	163	2.92	
Tobacco	105	1.88	
Electricity	105	1.88	
Electronic and electrical equipment	175	3.14	
Fixed line telecommunications	150	2.69	
Food and drug retailers	140	2.51	
Food producers	137	2.45	
Gas, water and multiutilities	107	1.92	
General retailers	173	3.10	
Health care equipment and services	164	2.94	
Household goods and home construction	172	3.08	
Industrial engineering	145	2.60	
Industrial metals and mining	159	1.92	
Industrial transportation	175	2.85	
Leisure goods	160	2.87	
Media	175	3.14	
Mining	173	3.10	
Oil and gas producers	145	2.60	
Oil equipment and services	185	3.32	
Personal goods	165	2.96	
Pharmaceuticals and biotechnology	109	1.95	
Real estate investment trusts	142	2.54	
Software and computer services	185	3.32	
Support services	143	2.56	
Technology hardware and equipment	183	3.28	
Travel and leisure	182	3.26	
Total	5570	100	



Table 1 (continued)

Panel A describes the sample selection, Panel B provides the distributional properties of the full sample by country, and Panel C presents sample distribution by industry. Observations are the total of firm-years observations by country and by industry

CSR_COMP, taking a value of 1 each year the firm reported inserting explicit CSR goals in the compensation contracts of NEOs, and 0 otherwise, similarly as in the work of Derchi et al. (2020) using the same data.

Control variables Several studies have incorporated one or more control variables to eliminate or mitigate their effects on the dependent variable. Thus, following previous researches, we included several control variables related to the characteristics of the company and its environment in our model. We retained as control variables: The effect of ethical behavior of countries (ETH_COUN); leverage refers to total liabilities scaled by total assets (FIRM_LEV); (FIRM_SIZE) is measured as the natural log of total assets; (FIRM_LIQT) is measured by the ratio of current assets divided by current liabilities; the pollutant sectors (POL_SEC) is a binary variable that takes the value of 1 if the company belongs to the polluting sectors and 0 otherwise; and the return on assets (ROA) is the net income divided by total assets. Finally, we added dummy variables to control for the year (YEAR), industry (INDUSTRY), and country (COUNTRY).

Research model

The main concern of this model was to examine the empirical link between the variables representing the ethical behavior of companies and their impact on real earnings management index while controlling for the effect of certain control variables.

$$\begin{aligned} \text{REM_INDEX}_{i,t} = & \beta_0 + \beta_1 \text{CSR_SCO}_{i,t} + \beta_2 \text{ETH_SCO}_{i,t} + \beta_3 \text{CSR_COMP}_{i,t} + \beta_4 \text{FIRM_LEV}_{i,t} \\ & + \beta_5 \text{FIRM_LIQT}_{i,t} + \beta_6 \text{FIRM_SIZE}_{i,t} + \beta_7 \text{ETH_COUN}_{i,t} + \beta_8 \text{ROA}_{i,t} + \beta_9 \text{POL_SECT}_{i,t} \\ & + \sum_{10}^{20} \text{YEAR}_{i,t} + \sum_{21}^{57} \text{INDUSTRY}_{i,t} + \sum_{58}^{63} \text{COUNTRY}_{i,t} + \varepsilon_{i,t}. \end{aligned} \quad (1)$$

All the variables are defined previously in Table 2. YEAR, INDUSTRY, and COUNTRY stand, respectively, for year, industry, and country fixed effects; ε : is the error term, and the indices i and t represent, respectively, the companies and the year.

Results and discussion

Descriptive statistics

Panel A of Table 3 provides the descriptive statistics for the continuous variables of this study. Descriptive analysis suggests that the mean from REMI is -0.0005 which is about -0.1% of average total assets of our sample. This can be explained by the fact that the firms of our sample have a heterogeneous level of REM. The level of this measure is similar to those of Zang (2012).

The maximum and minimum values of the “corporate social responsibility” (CSR_SCO) varied between (0.0395) and (0.9907), with a standard deviation of (0.2911), which is relatively high compared to the positive mean (0.6323). This result implies the remarkable and integral commitment of these companies to socially responsible practices. This heterogeneity between the minimum and maximum values can be attributed to the level of companies’ willingness to adopt socially responsible practices since our sample covers seven different nationalities.

Descriptive statistics show that the average value of the ethical behavior of companies included in our sample (ETH_SCO) is equal to (0.5140) with a standard deviation of (0.0545), which is relatively low compared to the average. This last finding can be explained by the fact that the majority of the firm part of the sample are more involved in the activities and actions of business ethics. This trend can be

attributed to the desire of these companies to establish traditions to promote the interests of the different stakeholders. The difference between the minimum and maximum values is due to various factors, including the economic situation, the application of national regulations by companies, and the cultural diversity of these countries.

In addition, this table shows that the firm size of the company selected from our sample has an average of 4.78749 and a very high standard deviation from the average is (21.9871). This corroborates the results found by Chen Angelina (2015). Finally, regarding the ethical behavior of countries (ETH_COUN), this variable has an average of the



Table 2 Definitions and measurements of study variables

Variables	Codename	Measures	Source
<i>Dependent variable</i>			
Real earnings management index	REM_INDEX	Real earnings management index, which equals the sum of the standardized measure of abnormal operating cash flows (AbnCFO), abnormal production costs (AbnPR), and abnormal discretionary expenses (AbnDE) $REMI = AbnCFO*(-1) + AbnPR + AbnDE*(-1)$	Thomson Reuters ASSET4 (Datastream) Cohen et al. (2008)
<i>Explanatory variables</i>			
Corporate social responsibility	CSR_SCO	CSR score was drawn from the ASSET4 database by using the Environmental, Social, and Governance (ESG) score	Thomson Reuters ASSET4 (Datastream)
Firm's ethics score	ETH_SCO	It is a score that consists of a series of items that count the company's performance in ethics developed by ASSET4	Thomson Reuters ASSET4 (Datastream)
CSR-Linked Executive Compensation	CSR_COMP	We created the binary indicator CSR_COMP, taking a value of 1 each year the firm reported inserting explicit CSR goals in the compensation contracts of Executive Officers, and 0 otherwise	Thomson Reuters ASSET4 (Datastream) Derchi et al. (2020)
Ethics country	ETH_COUN	Scores in this index range from one to seven, with one indicating a very low level of country ethics and seven indicating a very high level	World Economic Forum (2008)
Leverage	FIRM_LEV	Leverage ratio equals to the total debt to total equity	Thomson Reuters ASSET4 (Datastream)
Firm liquidity	FIRM_LIQT	Firm liquidity ratio equals to the current assets to current liabilities	Thomson Reuters ASSET4 (Datastream)
Firm size	FIRM_SIZE	Firm size equals to the natural logarithm of total assets	Thomson Reuters ASSET4 (Datastream)
Pollutant sector	POL_SEC	The pollutant sector is a binary variable that takes the value of 1 if the company belongs to the polluting sectors and 0 otherwise	ASSET4 Thomson Reuters (Datastream)
Firm profitability	ROA	The return on assets ratio is the net income divided by total assets	ASSET4 database (Datastream)

This table reports the definitions of the variables used in our study

order of (5.7305) with a minimum of (3.7887) and a maximum of (6.7781). Additionally, this variable has a standard deviation of (0.6718) which is lower than the mean. We will draw a fairly synthetic conclusion which relates to the majority of the countries in the sample of our study which are exposed to ethical behavior through the embracing of laws and regulations which makes it possible to strengthen transparency and credibility.

Among the control variables, the ethical behavior of countries variable (ETH_COUN) displays an average of around (5.730) with minimum and maximum values of (3.788) and (6.7), respectively. In addition, this variable has a relatively low standard deviation from the mean (0.5334). Accordingly, the majority of the countries in our sample are involved in the ethics process through the adoption of laws and regulations that aim to enhance transparency and

credibility. This highlights the contribution of the ethical culture of countries and its enormous contribution to the adoption of a policy of disclosure of information on the business environment.

Another result to highlight in Table 3 is that our control variable "the leverage" (FIRM_LEV) is quite low, a mean of 0.2866 with a relatively high standard deviation of 0.1796. This variable ranges between 0 and 1.0824.

Regarding the liquidity of the firm (FIRM_LIQT), the firms in our sample have an average (0.1394) and a very high standard deviation from the average is (0.3061), with a minimum of (0) and a maximum of (9.8461). This is explained by the diversity of our sample in terms of liquidity for each firm. The mean of value for firm size was 15.382, and the standard deviation from this result was 1.968 with minimum and maximum scores of 4.7874 and 21.987, respectively.



Table 3 Descriptive statistics

Variables	Obs	Mean	SD	Minimum	Maximum
<i>Panel A: Descriptive statistics for metric variables</i>					
REM_INDEX	5570	-0.0005	0.2965	-3.5156	4.9224
CSR_SCO	5570	0.6953	0.1675	0.0427	0.9503
ETH_SCO	5570	0.5140	0.0545	0.1500	0.6320
FIRM_LEV	5570	0.2866	0.1796	0	1.0824
FIRM_LIQT	5570	0.1394	0.3061	0	9.8461
FIRM_SIZE	5570	15.3823	1.9685	4.7874	21.9871
ETH_COUN	5570	5.7298	0.6725	3.7887	6.7781
ROA	5570	0.055	0.07	-0.149	0.281
Variables	Modalities				%
<i>Panel B: Frequencies (%) for binary variables</i>					
CSR_COMP	1				0.28
	0				0.72
POL_SEC	1				0.34
	0				0.66

This table reports descriptive statistics. Variables definitions are provided in Table 2

In terms of firm profitability (ROA), the mean of the firm profitability is 0.055, while the maximum and minimum are -0.149 and 0.281, respectively, with a standard deviation of 0.08.

As can be seen from Panel B of Table 3, CSR_COMP indicates 28% of sample firm's linked NEOs' compensation to CSR performance goals. Furthermore, this table shows that almost two-thirds (66%) of the firms in our sample belong to non-polluting sectors. Indeed, the predominance of non-polluting sectors can be attributed to the fact that companies in our sample belong to the ESG index in which this ranking is based on socially responsible behavior.

Inter-variable correlation results and testing panel data

Testing the assumptions of panel data regression given the particular nature of panel data, it is necessary to follow the order of some econometric steps and perform certain tests to lead to robust estimations. First, we point out that the fixed-effects model is discarded since our regression includes time-invariant dummy variables. Performing a fixed-effect regression would lead to arbitrarily made omitted such variables. The Breusch-Pagan LM test for random produces a significant Chi-square value. We confirm the existence of individual effects and we run a random effect regression. Second, we test for panel level heteroskedasticity using Breusch-Pagan test as shown in Table 5. The result of this test is a significant Chi-square, and hence, the null hypothesis of constant variance was rejected to signify the existence of heteroskedasticity problem. Finally, we test for

possible multicollinearity identification by Pearson. Table 4 presents results which allow us to state that all the correlation coefficients have values less than 0.8, which leads us to conclude that the problem of bivariate multicollinearity is completely absent.

Reliability test shows that fixed effect is most reliable for statistical inferences. Table 5 reports some tests conducted which are discussed. The appropriateness of using a fixed-effect (FE) model and random-effect (RE) model in the empirical estimation is proved by using Hausman's (1978) test (Table 5). The null hypothesis is that there is no systematic difference in the coefficients of FE and RE estimation. The rejection of the null hypothesis implies that there is a systematic difference in the coefficients; thus, we need to apply the FE model rather the RE model and vice versa (Jeffrey 2009). The Hausman's test results confirm that the FE method is more appropriate than the RE method. In addition, to test the heteroskedasticity problem, the Breusch-Pagan test is conducted and the test results confirm that there is evidence of heteroskedasticity. This table reports the result of the heteroscedasticity test. Rejection of the null hypothesis of the Breusch-Pagan test for heteroscedasticity suggests the absence of heteroscedasticity, and pooled OLS is optimal.

Estimation results and discussions

The multivariate analysis was used to assess the effect of the explanatory and control variables on the variable to be explained, i.e., real earnings management index. To measure the influence of the different explanatory variables on the REM, we used econometric estimation techniques on



Table 4 Correlation matrix

Variables	1	2	3	4	5	6	7	8	9
CSR_SCO (1)	1.00								
ETH_SCO (2)	-0.019	1.00							
CSR_COMP (3)	0.0234	0.052*	1.00						
FIRM_LEV (4)	-0.006	0.001	-0.029*	1.00					
FIRM_LIQT (5)	-0.058*	0.046*	0.002	0.050*	1.00				
FIRM_SIZE (6)	0.035*	-0.067*	-0.060*	0.131*	0.061*	1.00			
ETH_COUN (7)	0.008	0.011	-0.030*	-0.012	-0.044*	-0.001	1.00		
POL_SEC (8)	0.165*	-0.069*	-0.031	-0.054*	0.070*	0.058*	0.045	1.00	
ROA (9)	0.086*	0.073*	-0.060**	0.131*	0.061*	0.044*	-0.029*	0.015	1.00

This table presents the correlation matrix between the variables used in the study. Variables are defined in Table 2.

The asterisks ***, **, and * appearing close to a coefficient indicate the significance levels of 1%, 5%, and 10%, respectively

Table 5 Results of tests on panel data

Tests	Fixed-effect test Fisher test	Specification test Hausman's test	White test (<i>p</i> value)
Model 1	3.75 (0.000)	16.24 (0.0230)	10.11 (0.0015)

the panel data. The results of the multivariate analysis as well as the statistical tests to be verified are presented in Table 6. The results of the estimation from the panel data indicate that taking into account the individual specificity of

companies in the form of a fixed effect gives better results in terms of statistical significance compared to an individual random effect model. The main results obtained from the estimation can be interpreted as follows:

As can be seen from this table, the variable related to CSR makes it possible to reduce the extent of REM and presents an expected sign. When the company's commitment to CSR is high, the manager is motivated to reduce the REM practices ($\beta = -1.588, p < 0.00$). This result validates the first hypothesis of the study. It can be explained by the importance of the

Table 6 Regression results of real earnings management

Variables	Planned sign	Coef	T-Student	Sig
CSR_SCO	(-)	-1.588	-5.75	0.000***
ETH_SCO	(-)	-3.548	-11.44	0.000***
CSR_COMP	(-)	-0.715	-0.92	0.376
FIRM_LEV	(-)	-0.669	-3.57	0.000***
FIRM_LIQT	(+)	0.005	1.50	0.130
FIRM_SIZE	(+)	0.806	2.25	0.028**
ETH_COUN	(-)	-6.796	-2.48	0.013**
POL_SEC	(+)	2.102	2.16	0.030**
ROA	(-)	-0.125	-1.15	0.19
Constant		114.151	0.58	0.563
Year fixed effect		Yes		
Country fixed effect		Yes		
Industry fixed effect		Yes		
Homogeneity test		$F = 6.30 (0.000)$		
Hausman test (Khi-deux)		EF ($p < 0.05$)		
White test (<i>p</i> value)		11.19 (0.0015)		
Observations		5570		
R^2		0.19		

Table 5 presents the results of regression estimation that includes fixed effects for fiscal year and industry. Year, industry, and country indicators are included in our model, but their coefficients are not shown in this table

*, **, ***Significance at $p < 0.01$; $p < 0.05$; and $p < 0.10$, respectively



ESG criterion in the valuation of companies and confirms those found by Gras-Gil et al. (2016), who has a negative and significant relationship between CSR and REM.

As can be seen from the same table, the ethical behavior of companies has a negative and statistically significant relationship with the level of REM at the 1% significance level ($\beta = -3.548, p < 0.00$). Thus, the more important the socially responsible and ethical practices are, the less the company engages in an aggressive REM strategy. Hence, our second hypothesis (H2) is validated. In other words, ethics helps strengthen the financial security of investors. Indeed, previous empirical evidence suggests that the capital market sets a lower value for companies that are seen as unethical (Orlitzky 2003). Similarly, researchers and practitioners have reported that the financial market rewards ethical companies by increasing their valuation (Verschoor 1999). Our results corroborate the results of previous studies that documented the link between ethical commitment and business valuation, namely Choi and Jung (2008) and Choi and Pae (2011).

The statistical results demonstrate the absence of a significant relationship between the CSR-linked executive compensation and REM ($\beta = -0.715, p > 0.00$). Accordingly, the third hypothesis (H3) is rejected as executive incentive compensation based on the achievement of sustainable development objectives remains difficult to apply in the companies of our sample. Moreover, this result indicates the superiority of the classical management incentive scheme in reducing the manipulation of results. This finding is in accordance with the results of Li and Thibodeau (2019).

Regarding the control variables, we find a significant negative relationship between the leverage and the real earnings management index ($\beta = -0.669, p < 0.00$). This result shows that European companies belonging to the ESG index of our sample have a higher debt ratio and significant restrictive covenants on the part of banks to limit the discretionary margin of managers. Such companies are forced to limit the manipulation of the result through real activities, such as investing, financing, and operating. Also, the contractual clauses push the company to respect a few ratios and limit the manager's discretionary margin. These results are inconsistent with those found by Ahmed et al. (2002). Moreover, we find a significant positive relationship between the size of the company and REM ($\beta = 0.806, p < 0.05$). These results confirm those found by Bozzolan et al. (2015).

The results from the estimation of the model revealed a positive but nonsignificant correlation between the liquidity of the firm (FIRM_LIQT) and REM. This shows that this variable is not a determining factor in the explanation of REM in the context of European companies. Our results are, thus, not consistent with those of Cuong et al. (2018). In addition, the influence of pollutant sector (POL_SEC) turns

out to be positively and significantly correlated ($\beta = 2.102, p < 0.05$) with the REM index, as expected.

Finally, the statistical tests show that there is a negative and significant relationship between the ethical behavior of countries and REM for a significance level of 5% ($\beta = -6.796, p < 0.05$). These results show that the ethics of countries is a determining factor in real earnings management. We can, therefore, conclude that the involvement of the majority of the countries in our sample in the ethics process through the adoption of laws and regulations aims to consolidate the credibility and transparency of companies.

Robustness checks

To examine the robustness of our results, we carry out an additional analysis. Our additional analyzes relate to:

- Alternate measures of independent variable (CSR).
- Endogeneity.

Alternate variables' measures

To have more conclusive and robust results, it is fundamental to examine the effect of the four dimensions of CSR (social responsibility, economic responsibility, environmental responsibility, and good governance) instead of the aggregate measure of CSR on REM. More specifically, we regressed the effect of the four dimensions of CSR as well as the other variables of the ethical approach in addition to other control variables on the variable of interest, i.e., REM.

$$\begin{aligned} \text{REM_INDEX}_{i,t} = & \beta_0 + \beta_1 \text{ENV_SCO}_{i,t} + \beta_2 \text{SOC_SCO}_{i,t} \\ & + \beta_3 \text{ENC_SCO}_{i,t} + \beta_4 \text{GOV_SCO}_{i,t} \\ & + \beta_5 \text{ETH_SCO}_{i,t} + \beta_6 \text{CSR_COMP}_{i,t} \\ & + \beta_7 \text{FIRM_LEV}_{i,t} + \beta_8 \text{FIRM_LIQT}_{i,t} \\ & + \beta_9 \text{FIRM_SIZE}_{i,t} + \beta_{10} \text{ETH_COUN}_{i,t} \\ & + \beta_{11} \text{ROA}_{i,t} + \beta_{12} \text{POL_SECT}_{i,t} \\ & + \sum_{13}^{23} \text{YEAR}_{i,t} + \sum_{24}^{60} \text{INDUSTRY}_{i,t} \\ & + \sum_{61}^{66} \text{COUNTRY}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

In this second model (2), we sought to adopt a more rigorous and more robust approach in the sense that regression by the three dimensions of CSR allows us to surmount the accounting phenomenon to be explained, i.e., REM.



Table 7 Robustness analysis on alternative variables' measures

Variables	Planned sign	Coef	T-Student	Sig
ENV_SCO	(-)	-1.5711	-1.97	0.049**
SOC_SCO	(-)	-0.4554	-2.02	0.044**
GOV_SCO	(-)	-1.7611	-3.92	0.000***
ETH_SCO	(-)	-4.9110	-10.52	0.000***
CSR_COM	(-)	-0.5146	-0.75	0.454
FIRM_LEV	(+)	1.0234	0.38	0.705
FIRM_LIQT	(+)	0.108	0.64	0.525
FIRM_SIZE	(-)	0.513	1.872	0.084*
ETH_COUN	(+)	0.014	-3.592	0.000***
POL_SEC	(+)	0.164	1.982	0.048**
ROA	(-)	0.125	-0.811	0.419
Constant		1.254	0.51	0.607
Year fixed effect	Yes			
Country fixed effect	Yes			
Industry fixed effect	Yes			
Homogeneity test	$F=6.30$ (0.000)			
Hausman Test (Khi-deux)	EF ($p<0.05$)			
White test (p value)	10.11 (0.0015)			
Observations	5570			
R^2	0.18			

This table reports results of an additional test to extend our research; we explore the impact of the four dimensions of CSR individually as follows: the environmental dimension (ENV_SCO), the social dimension (SOC_SCO), the economic dimension (ECN_SCO), and the governance dimension (GOV_SCO). Year and firm indicators are included in the model, but their coefficients are not shown in this table. Measurements are summarized in Table 2. The t-statistics are based on firm-level clustered standard errors. Year, industry, and country indicators are included in our models, but their coefficients are not shown in this table

*, **, ***Significance at $p<0.01$; $p<0.05$; and $p<0.10$, respectively

The results presented in Table 7 indicate that there are no significant differences between the results of the first model (1) and those of the second (2). This allows us to confirm the results found initially by indicating the effect of the variables of the ethical behavior of the companies on the reduction of the scale of REM. The effect of the CSR components examined individually is similar to that found when CSR is examined by its mean score.

Endogeneity

The relationship between corporate social responsibility (CSR) and real earnings management is a mitigate. According to Choi et al. (2018), CSR engagement and earnings management may be codetermined, with each affecting the other. In this case, estimating either CSR or earnings management regressions may result in endogeneity. In order to address the above two endogeneity issues, this study applies the Heckman 2-stage specification to correct the selection bias caused by CSR engagement decision. Further, this study uses a differencing equation to eliminate the simultaneity problem.

Table 8 Probit model results

Dependent variable	(5) CSR_DUM
FIRM_LEV	2.125** (1.86)
FIRM_LIQT	0.258 (1.25)
FIRM_SIZE	2.102** (1.99)
ETH_COUN	0.189*** (8.72)
POL_SEC	-2.021* (1.77)
ROA	0.298*** (3.50)
Constant	2.08 (1.25)
Year fixed effect	Yes
Country fixed effect	Yes
Industry fixed effect	Yes
Observation	5570
R^2	0.29

Z-statistics in parentheses *** $p<0.01$; ** $p<0.05$; * $p<0.1$



To control for any endogeneity bias stemming from reverse causality, specifically that firms with higher valuation or that have performed better in the past might be able to afford or support higher CSR disclosure levels, we re-estimate our analysis using the instrumental variable (IV) approach and report our findings are presented in Model (5) of Table 8. This table shows the results from probit regressions with CSR_DUM as the dependent variable. CSR_DUM is an indicator variable that set to one for firm-level CSR disclosure in the top quartile of the distribution.

First, we implement the IV estimation procedure to check whether our results suffer from endogeneity between CSR and real earnings management. We follow Attig et al. (2013) in using the firm-level initial value of the CSR disclosure score as an instrument. This IV is very likely to be exogenous to the contemporaneous CSR disclosure score. We employ a twostep regression to estimate the IV model. First, we regress the CSR engagement level on the IV and all the control variables used in the main regression model (see Table 2, Model (1)). Second, we preserve the predicted value of the CSR level and fit it into our baseline model. The first-stage regression findings show that the IV is significantly related to the CSR score.

We then save the predicted value of the CSR score and use it rather than the CSR score in the regression examining the impact of the CSR engagement on real earnings management. We present the 2SLS regression results in Model (3) (Table 9). The findings are consistent with our main prediction that the CSR engagement is negatively and significantly associated with real earnings management (t -statistics = -2.079), suggesting that endogeneity does not drive our main findings.

Second, we follow Harjoto and Jo (2009) and use Heckman's (1979) two-stage estimation procedure to solve the potential endogeneity of CSR score. First, we redefine the CSR disclosure score into a dummy variable (CSR_DUM) coded one for firm-level CSR disclosure in the top quartile of the distribution. In the first step, a probit model regression using CSR_DUM as the dependent variable is carried out. The explanatory variables in the first-stage probit regression include all the independent and control variables from the baseline model (Table 6, Model (1)), and industry and year dummy variables. The estimated parameters from the first-stage probit regression model are used to calculate the self-selection parameter LAMBDA (or inverse Mill's ratio), which is incorporated as an additional explanatory variable in the second-stage OLS estimation. Using Heckman's two-stage selection model, we correct the specification for endogeneity and test whether CSR disclosure reduces the real earnings management. The second-stage regression

Table 9 Robustness check results on endogeneity

Variables	(1) OLS	(3) 2SLS	(4) HECKMAN
CSR	-1.588*** (-5.75)	-0.048** (2.079)	
CSR_DUM			-0.455*** (-3.564)
ETH_SCO	-3.548*** (-11.44)	-2.45*** (-3.68)	-3.301*** (3.98)
CSR_COMP	-0.715 (-0.92)	1.25 (0.152)	6.360 (0.163)
FIRM_LEV	-0.669*** (-3.57)	-1.258*** (3.77)	0.244*** (3.89)
FIRM_LIQT	0.005 (1.50)	0.258 (1.60)	0.232 (0.158)
FIRM_SIZE	0.806** (2.25)	0.458* (1.85)	2.350** (1.97)
ETH_COUN	-6.796** (-2.48)	-5.155*** (4.258)	2.125** (2.89)
POL_SEC	2.102** (2.16)	2.12** (2.87)	0.075** (2.24)
ROA	-0.125 (-1.15)	1.02 (1.54)	0.065 (1.57)
LAMBDA			-2.301*** (-8.301)
Constant	114.151 (0.58)	12.25 (0.99)	12.356 (1.05)
Year fixed effect	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Homogeneity test	$F=6.30$ (0.000)	$F=8.50$ (0.000)	$F=8.180$ (0.000)
Hausman test (Khideux)	EF ($p < 0.05$)	EF ($p < 0.05$)	EF ($p < 0.05$)
White test (p value)	10.11 (0.0015)	12.25 (0.0054)	13.87 (0.0012)
Observation	5570	5570	5570
R^2	0.18	0.19	0.21

(1) OLS: ordinary least squares, (3) 2SLS: the two-stage least squares, and (4) Heckman models. Models (3) and (4) examine the robustness of our main inference in Model (1). Variables definitions are outlined in Table 1. Beneath each estimate is reported the robust T statistic

(Table 9, Model (4)) results suggest that the negative relationship between CSR disclosure and real earnings management is maintained (t -statistics = -3.564). The coefficient on LAMBDA is significant in the second-stage regression, implying that the firm characteristics making them choose to disclose more CSR-related information are significantly associated with real earnings management. We find the remaining results to be consistent with our hypotheses.



Research contributions and implications

By retaining the hypothesis of the non-neutrality of accounting information and given the lack of use of comprehensive and sociological approaches for the explanation of accounting choices affecting the quality of financial information, the adoption of a complementary approach seems necessary; then, recourse to behavioral and cognitive approaches will make it possible to explain the origin of this subjectivity of accounting information.

Because the decision on the choice of accounting policies is the responsibility of managers who can make these choices according to their objectives, rigorous control should be exercised over managers to ensure that effective accounting decisions are made. For this reason, companies are encouraged to incorporate a component of socially responsible practices into their business strategies. Thus, the level of the company's commitment to business ethics can be reflected in its financial reporting choices; therefore, the quality of financial reporting can be enhanced by ethical business decision making. However, it is worth noting that the company's commitment to business ethics will be effective only when properly implemented. Indeed, if we consider that managers are better informed than investors about the prospects of their company, it is in their interest to communicate to the market the private information they hold through adequate management of the accounting result (Janin and Piot 2008). However, even though most investors have a relatively sophisticated reading of the financial statements, it is not easy to distinguish whether managers manage the published figures in an opportunistic and, therefore, deceptive manner, or whether, on the contrary, they aim by their intervention to strengthen the informative content of accounting figures to inform the market about the company's prospects. Hence the interest in examining earnings management from the perspective of business ethics. In this sense, the commitment to business ethics or CSR should not be implemented for the satisfaction of immediate obligations, such as the guarantee of an exponential stock market valuation or a particular stakeholder but as a strategic vision of improving the quality of information.

The contribution of this study could be observed by the fact that the reading and analysis of the real earnings management differ between the contractual approach and the ethical behavior of companies. Thus, the integration of new dimensions in the explanation and determination of REM remains under-studied. The explanation of the quality of the results by ethical or social variables makes it possible to surmount the criticisms addressed to the contractual approaches of companies. Indeed, this is useful for those who use financial reports frequently, especially investors who seek profitable but responsible investment opportunities.

Otherwise, we control for possible endogeneity problems resulting from simultaneity or reverse causality by using the Heckman 2-stage specification to correct the selection bias caused by CSR engagement decision. Consideration of this issue is essential to the relevance of our study as it is supposed as one of the frequent constrains from which much of the research on the CSR topic suffers (Villaron-Peramato et al. 2018). The findings are consistent with our main prediction that the CSR engagement is negatively and significantly associated with real earnings management, suggesting that endogeneity does not drive our main findings.

Conclusion

The aim of this article is to examine the link between corporate social responsibility practices and the level of real earnings management of a sample firms belonging ESG index from five European countries. The originality of this study lies, essentially, in the interaction between two fields of research to explain the quality of financial information (accounting) by the approach of the ethical behavior of companies (psychology). In this perspective, we proposed to mobilize the models of the legitimacy and stakeholder theories in the explanation of the behavior of companies regarding real earnings management. Indeed, the consideration of ethical and societal dimensions contributes to enriching the positive theory of accounting and opens up new perspectives in accounting through a renewal of the understanding of the issues related to the manager's accounting choices and, consequently, to the quality of financial information.

This research is positioned in a positivist paradigm and called for a verification of the theoretical deductions, by means of an empirical study on a sample of 557 European companies belonging to the ESG index during the period spanning 2010–2019. In this sense, we used the multiple linear regression applied to panel data. Using this analysis allowed us to explain the effect of CSR, ethics and executive incentive compensation based on the achievement of sustainable development objectives on the extent of REM.

We estimated two models following the conception we adopted for CSR. In the first step, we used CSR as a general index. Then, we estimated another model by integrating the individual dimensions of CSR. Our empirical results confirm the majority of the expected signs. The variables relating to the ethical behavior of companies have a statistically significant and negative relationship with the level of real earnings management. It turns out that the more important the socially responsible and ethical practices, the less the company engages in an aggressive REM strategy. Thus, the integration of new dimensions in the explanation and determination of REM



remains under-explored. The explanation of the quality of the results by ethical or societal variables makes it possible to overcome the criticisms addressed to the contractual approaches of companies.

Furthermore, this article offers a first series of responses to the importance of taking ESG criteria into account in improving the quality of information and, therefore, the transparency process of companies. We tried to provide explanations and managerial solutions for managers of companies belonging to the ESG index to improve their accounting strategy by drawing inspiration from the moral and ethical approach to business. This would make it possible to improve the quality of the information disclosed on growth opportunities that would into an improvement in the financial performance of companies.

These contributions remain subject to two main limitations associated with the constraints imposed by the implementation of such work. The first limitation is the nature of our sample and its size, which is relatively small. More explicitly, the generalization of the results of this study is not possible. The second limitation relates to the fact that the manager's profile is not taken into account in our research models. It is interesting to recall that the manager occupies a central position in the financial and accounting policy of the company, especially in a context where the environmental, social, and governance (ESG) dimensions are the rules of the game.

However, the failure to take into account the variables relating to the characteristics of the manager represents a major limitation of this work. Future research could henceforth be based on comparative studies between the Mediterranean countries and examine the impact of the governance structures of their companies on financial transparency in the context of companies belonging to the ESG index.

Appendix: Definition and measurement of REM index

Proxy 1: Abnormal cash flow from operations

In order to estimate the abnormal CFO, first the normal CFO is estimated. This is expressed as a linear function of sales (S_t) and the change in sales (ΔS_t). With this equation, the coefficients are estimated. All the variables in the model are scaled by lagged total assets (A_{t-1}) so that heteroskedasticity is reduced

$$CFO_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta_1(S_t/A_{t-1}) + \beta_2(\Delta S_t/A_{t-1}) + \varepsilon_t \quad (3)$$

where CFO_t = cash flow from operations in period t ; A_{t-1} = lagged total assets; $\Delta S_t = S_t - S_{t-1}$, change in sales; α_0 , α_1 , β_1 and β_2 = parameters; ε = error term.

By using the estimated coefficients from Eq. (3), the normal cash flow from operations (NCFO_{*t*}) is calculated

$$NCFO_t/A_{t-1} = a_0 + a_1(1/A_{t-1}) + b_1(S_t/A_{t-1}) + b_2(\Delta S_t/A_{t-1}) \quad (4)$$

where NCFO_{*t*} = normal cash flow from operations in period t ; a_0 , a_1 , b_1 and b_2 = estimated coefficients of the parameters.

After calculating the NCFO_{*t*}, the abnormal CFO (ABN_CFO_{*t*}) is calculated. The ABN_CFO_{*t*} is the actual CFO minus the NCFO_{*t*} that was calculated with Eq. (4)

$$ABN_CFO_t = CFO_t/A_{t-1} - NCFO_t/A_{t-1} \quad (5)$$

where ABN_CFO_{*t*} = abnormal cash flow from operations in period t .

Proxy 2: Abnormal production costs

The steps that were taken to calculate the abnormal CFO are performed for the abnormal production costs. First, the definition of production costs is provided. Roychowdhury (2006) defines production costs (PROD_{*t*}) as the sum of costs of goods sold (COGS_{*t*}) and the change in inventory (ΔINV_t). ($PROD_t = COGS_t + \Delta INV_t$). Since the PROD_{*t*} consists of COGS_{*t*} and ΔINV_t , Roychowdhury (2006) estimates these as following:

$$COGS_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta_1(S_t/A_{t-1}) + \varepsilon_t \quad (6)$$

where COGS_{*t*} = costs of goods sold in period t

$$\Delta INV_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta_1(\Delta S_t/A_{t-1}) + \beta_2(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t \quad (7)$$

where ΔINV_t = change in inventory.

Then, the normal level of COGS_{*t*} and ΔINV_t is calculated by using the estimated coefficients from Eqs. (6) and (7):

$$COGS_t/A_{t-1} = a_0 + a_1(1/A_{t-1}) + b_1(S_t/A_{t-1}) \quad (8)$$

$$\Delta INV_t/A_{t-1} = a_0 + a_1(1/A_{t-1}) + b_1(\Delta S_t/A_{t-1}) + b_2(\Delta S_{t-1}/A_{t-1}) \quad (9)$$

The production costs are estimated by the sum of Eqs. (6) and (7) and are modeled as following:

$$PROD_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta_1(S_t/A_{t-1}) + \beta_2(\Delta S_t/A_{t-1}) + \beta_3(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t \quad (10)$$

where PROD_{*t*} = production costs in period t .

Consequently, the normal level PROD_{*t*} is calculated by using the estimated coefficients from Eq. (10)



$$\begin{aligned} \text{NPROD}_t/A_{t-1} = & a_0 + a_1(1/A_{t-1}) + b_1(S_t/A_{t-1}) \\ & + b_2(\Delta S_t/A_{t-1}) + b_3(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t \end{aligned} \quad (11)$$

where NPROD_t = the normal production costs in period t .

Lastly, the abnormal production costs (ABN_PROD_t) are estimated as the actual PROD_t , minus the NPROD_t

$$\text{ABN_PROD}_t = \text{PROD}_t/A_{t-1} - \text{NPROD}_t/A_{t-1} \quad (12)$$

where ABN_PROD_t = abnormal production costs.

Proxy 3: Abnormal discretionary expense

The last proxy for the use of real earnings management is the abnormal discretionary expense. Just as the equations presented before, the discretionary expense is modeled as a linear function of sales

$$\text{DISEXP}_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta_1(S_{t-1}/A_{t-1}) + \varepsilon_t \quad (13)$$

where DISEXP_t = the discretionary expense in period t .

Consequently, the estimated coefficients in Eq. (13) are used in Eq. (14) to estimate the normal discretionary expense (NDISEXP_t).

$$\text{NDISEXP}_t/A_{t-1} = a_0 + a_1(1/A_{t-1}) + b_1(S_{t-1}/A_{t-1}) \quad (14)$$

Finally, the abnormal discretionary expense (ABN_EXP_t) is measured as the difference between the actual and the normal discretionary expense

$$\text{ABN_DISEXP}_t = \text{DISEXP}_t/A_{t-1} - \text{NDISEXP}_t/A_{t-1} \quad (15)$$

where ABN_DISEXP_t = abnormal discretionary expenses.

In order to have a comprehensive metric and capture the total effect of real earnings management, we aggregate the three measures of real manipulation activities into one proxy, REMI, by taking their sum as follows (Cohen et al. 2008; Cohen and Zarowin 2010; Zang 2012): $\text{REMI} = (-1) * \text{AbnCFO} + \text{AbnPR} + \text{AbnDE} * (-1)$.

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