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Environmental sustainability disclosure and accounting conservatism

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ABSTRACT

In this article, we analyzed whether the level of accounting conservatism of a firm is affected by its environmental sustainability information disclosure. For that purpose, we developed two Environmental Disclosure Indices (EDI), one obtained from the mandatory reporting (annual report) and the other from the voluntary reporting (sustainability report), and compared the effects on conditional conservatism. Content analysis was used to develop two indices to evaluate the level of environmental disclosures. Moreover, the technique of multiple linear regression, using panel data, was applied to provide original empirical evidence for Portuguese companies listed on the stock exchange. We found evidence that higher environmental sustainability information disclosure enhances the conservative accounting practice, which is consistent with the argument that a higher level of Corporate Social Responsibility tends to increase financial statements transparency. In addition, we found that environmental information disclosed in specific and voluntary reporting has a superior impact on the level of conditional conservatism. These results showed that managers tend to engage in earnings management activities by being more accounting conservative in order to meet shareholders' expectations and disclose higher levels of environmental information. Therefore, this article brings some insights to the debate about the usefulness of accounting conservatism and the contribution of sustainability goals to monitor and guide managers' activities.

1. Introduction

Over the past decades, we have witnessed a dramatic degradation of the environment resulting from the overuse of natural resources and high levels of pollution that harm the well-being of future generations. Therefore, firms are becoming more committed to engaging in activities that contribute to sustainable development and that are consistent with Corporate Social Responsibility (CSR). Firms are also aware of the benefits of disseminating environmental activities to their stakeholders.

In this study, we analyzed whether CSR commitment increases earnings quality by assessing the impact of environmental information disclosure on the level of conditional conservatism. Prior literature gives opposite arguments regarding the impact of CSR on earnings management practices. While Kim et al. (2012) argued that more socially responsible firms exhibit more transparent financial statements and their managers engage in fewer earnings management activities, Salewski and Zülch (2014) stated that firms with a high level of CSR tend to develop more earnings management. Based on agency theory, the association between CSR and earnings management is positive because managers have to meet stakeholders' expectations, leading to a higher level of CSR and to more earnings management activities. By contrast, based on legitimacy theory, the association is expected to be negative. In fact, firms following the legitimacy theory are committed to CSR as a strategy to achieve society's expectations.

To analyze earnings quality, we relied on conditional conservatism, and regarding CSR we focused on the environmental dimension.

According to previous literature, accounting conservatism may be conditional or unconditional. The main difference is that conditional depends on news events while unconditional does not and it further implies a consistent under-recognition of net assets (Basu, 1997; Ruch and Taylor, 2015; Cerqueira and Pereira, 2020). As we aimed to analyze the effect of environmental disclosure on accounting conservatism we decided to focus on

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conditional conservatism. The effect of accounting conservatism on earnings quality proxies has been analyzed by Ruch and Taylor (2015). Based on previous studies, these authors found that conditional conservatism has a negative effect on earnings persistence, which leads to lower pricing indicators on earnings. In addition, and opposite to what is expected, conservatism may result from an aggressive accounting practice, in order to downward opportunistically earnings as the strategy of "big bath." Therefore, accounting conservatism has more negative effects on earnings quality than positive effects.

In the case of environmental reporting, prior literature has widely debated this issue, because society, in general, needs to understand the involvement of firms with the environment, which implies the disclosure of their environmental strategies, as well as their economic performance (Badia et al., 2020). Annual financial reporting often presents information about environmental activities developed by firms. According to Malarvizhi and Matta (2016), environmental information began to be disclosed on annual reports from the 1970s. Portuguese companies listed on the stock exchange market are required to disclose environmental information if these matters are materially relevant for measuring the entity's performance or financial position, according to International Accounting Standards (IAS)/International Financial Reporting Standards (IFRS), adopted by the European Union (EU) or Commercial Companies Code. Therefore, if listed companies opt to disclose environmental information in the mandatory reports (annual reports), based on the local accounting standard no. 26 (IFRS 26), this is done on a voluntary basis. However, the environmental information nature disclosed in the mandatory reports differs from the voluntary report because, in the latter, the reports can be prepared according to guidelines/standards issued by different organizations that promote the disclosure of non-financial information (Jastrzębska, 2016). Therefore, in this study, we expected differences between the disclosed environmental information in annual reporting and in sustainability reporting. Then, to study the impact of the environmental dimension on conservatism accounting, we constructed two indices of environmental information disclosure, one from information disclosed on annual mandatory reporting and the other from voluntary sustainability reporting.

Therefore, we aim to contribute to the ongoing debate on whether being more socially responsible increases the quality of financial statements by providing evidence on the association between conditional conservatism and environmental information disclosure. First, our results showed that Portuguese-listed firms are accounting conservative. Second, our results suggested a more conservative accounting practice for firms with higher environmental information disclosure being consistent with the idea that a higher level of CSR enhances a more conservative account practice. Thirdly, our evidence showed that conditional conservatism was more affected by environmental information disclosed on sustainability reporting rather than on annual reporting, which may result from a greater commitment when information is disclosed on a specific and voluntary basis.

In addition to the introduction, the structure of the article also includes the following sections. Section 2 displays the literature review and develops the hypotheses to be tested in the empirical study. Section 3 describes the empirical research design. Section 4 documents some descriptive statistics and reports the results of the empirical tests and Section 5 presents some concluding remarks.

2. Literature review and hypotheses development

The company's stakeholders should use accounting information as a guide for better decisions (Akhtar and Liu, 2018). Accounting for decisions is founded on the behavioral decision theory (Hogarth, 1993). Thus, financial information quality is a sin qua non-condition for decision quality (Akhtar and Liu, 2018; Baugh et al., 2020).

Previous research is focused on the role of accountability in decision quality (Fehrenbacher et al., 2020). For Fehrenbacher et al. (2020) "accountability refers to whether participants are accountable for "how they arrived at their decision," which potentially captures aspects of both the decision process and the decision outcome." Process accountability requires and motivates managers to justify their decision process (Dalla Via et al., 2019; McAllister et al., 1979). Dalla Via et al. (2019) showed that outcome accountability has effects on the decision quality while process accountability does not improve decision quality. Regarding the relationship between accountability and legitimacy, Lerner and Tetlock (1999) argued that if accountability is perceived as illegitimate (as intrusive and insulting) "any beneficial effects of accountability should fail and may even backfire."

International financial and accounting scandals, as Enron, Worldcom, and Parmalat, stressed that accounting regulations may not be sufficient to enforce information accountability, as it raises questions about the moral values of business managers and accountants (Montenegro and Rodrigues, 2020; Langberg and Sivaramakrishnan, 2008). The literature suggests that there is a need for high-quality accounting standards, more effective enforcement of accounting standards, and for corporate oversight bodies to become more involved in this process because the "harmonization of applied accounting standards does not necessarily result in the consistent application of accounting standards and therefore can be considered as only a necessary, but not a sufficient element in order to establish a high-quality cross-jurisdictional accounting environment" (Böcking et al., 2015).

Although the principles-based nature of the IFRS gives room for accounting treatments to reflect a true and fair view of the company, the truth is that the flexibility and gaps existing in the IFRS provide some degree of freedom to the preparer of accounting information, which may give rise to the development of creative practices (IASB, 2020). Creativity, according to Akpanuko and Umoren (2018), is a term that "involving the generation of new ideas or concepts, or new associations between existing ideas or concepts, and their substantiation into a product that has novelty and originality."

For Diana and Madalina (2007), the development of economic, legal, and social activities and the stress of financial statement users have made accounting innovation a necessity. Accounting innovation is not a new phenomenon (Diana and Madalina, 2007). In fact, this phenomenon has existed since the Industrial Revolution (Al Momani and Obeidat, 2013). Therefore, the enforcement of accounting standards and earnings management is a relation addressed in several studies (Böcking et al., 2015). The use of earnings management practices aiming to present a more favorable or desired position of the company's economic and financial situation is referred to as accounting-based earnings management practices (Khatri, 2015). Thus, according to Jawad and Xia (2015), innovation is an essential part of accounting-based earnings management practices.

Accounting-based earnings management practices "refers to the accounting practice that may (or may not) follow the accounting principles or standards, but deviate from what these principles or standards intend to achieve, in order to show a desired image of the company to the stakeholders" (Bhasin, 2016). Remenarić et al. (2018) added that "companies nowadays are increasingly resorting to "cooking' financial statements in order to present a more attractive business image and attract as many investors as possible."

In the literature, accounting-based earnings management practices are rooted in anti-ethical practices (Montenegro and Rodrigues, 2020; Remenarić et al., 2018), "since it doesn't meet the main objective of financial reporting–to present a fair and objective picture of the business" (Remenarić et al., 2018).

Ethics, according to Besio and Pronzini (2014), defined good behavior, which involves actions that will do more good than harm for most individuals. The introduction of unethical elements into accounting practices means that the resulting financial information becomes anything but true and fair (Sen and Inanga, 2005), influencing the business decision. Thus, poor quality information can lead to poor decisions, with a consequent impact on the company's performance (Laudon and Laudon, 2012; Cepêda and Monteiro, 2020).

In fact, the current IFRS allows the development of accounting-based earnings management practices, which can motivate less ethical behavior that deviates from the main objective that is to provide useful information for decision making (Figueira et al., 2021). Business ethical values play a significant role in the adoption or rejection of accounting-based earnings management practices (Shahid, 2016).

Accounting literature also examines the effects of accounting conservatism on financial statements (Ruch and Taylor, 2015). Although both concepts are related to earnings management, the concept of conservatism is different from accounting-based earnings management. For Li and Chao (2020), accounting conservatism "is a crucial accounting principle and refers to the prudent attitude that accountants must adapt when facing the risks of an operating environment and the uncertainties of a firm." Conservative accounting reporting involves temporal asymmetry in the recognition of accounting gains versus losses and the systematic understatement of net assets (Givoly et al., 2007). Thus, conservative reporting means that if the expected results of a particular event are unfavorable, these are recognized quickly in the income, while recognition of the effects of favorable events is deferred (Basu, 1997). According to Lafond and Roychowdhury (2008), "accounting conservatism involves the use of stricter standards for recognizing bad news as losses than for recognizing good news as gains." Conservatism in accounting is also recognized "as the differential verifiability required for recognition of profits versus losses" (Watts, 2003).

In this context, prior studies have provided mixed evidence on the costs and benefits of conservative accounting practices. On the one hand, accounting regulators (IASB and FASB) argue that conservatism biases accounting information and therefore compromise neutrality and it may also compromise the efficiency of decision-making (Ruch and Taylor, 2015; Gigler et al., 2009). On the other hand, academics and the accounting practice over time show that conservatism is an efficient contracting and governance mechanism (Watts, 2003). Furthermore, Hellman (2008) also indicates that conservatism is often correlated to a reliable reporting of past events.

Sterling (1967) argued that whenever conservatism clashes with a conventional accounting policy (e.g., valuation of inventory at the lower cost, either market or historical cost), there is a preference in practice for the more conservative policy, but there are problems of delimiting the use of conservatism to some appropriate level.

According to the IASB and FASB, prudence and conservatism are not desirable qualities in financial reporting (Hellman, 2008). According to the author, although conservatism is downplayed by the IASB, accountants will still have to deal with the uncertainty that the company faces when preparing accounts (Hellman, 2008). In addition, IFRS is based on principles rather than rules, contains several options, and requires the use of judgment. These features provide managers flexibility when preparing financial statements, which allows adjusting accounting practices to minimize changes relative to pre-adoption accounting practices (Kvaal and Nobes, 2010; Ball, 2006; Nobes, 2006).

In the case of Portuguese firms, they are expected to be conservative given that they are included in the Continental European countries (Gray, 1988; Feleagă et al., 2010). Therefore, we posited the following hypothesis:

H1: Portuguese-listed firms exhibit a conservative accounting practice.

In the last decades, "conducting socially ethical and responsible business has been an important issue in the business environment" (Kurniawan and Wibowo, 2009). In this respect, stakeholders are pushing and taking up space in the CSR field and influencing the behavior of companies. "Given the expertise, strategic interests, and grass-roots connections of stakeholders, it is feasible that they can improve CSR outcomes and community impacts" (Fordham and Robinson, 2018).

Accounting conservatism or earnings management and CSR have received much attention recently (Francis et al., 2013; Hong, 2020; Salewski and Zülch, 2014). Gao and Zhang's (2015) results showed that "CSR is proved desirable as it adds a unique "quality dimension" to earnings attributes and is useful for firm valuation." Salewski and Zülch (2014) argued that firms with a high level of CSR tend to develop more earnings management. Anagnostopoulou et al. (2020) study revealed that higher levels of conservatism are negatively associated with CSR initiatives, however, there is a significant trend reversal of the effect of conservatism on CSR, in a post-financial crisis period. These authors' study "provides strong evidence that the association between conditional conservatism and CSR can be strongly shaped by pressure from the side of financial stakeholders and also driven by a lack of financial resources." Hong's (2020) study examined the relationship between CSR activities and conservatism of listed companies in Korea and it shows that companies with higher CSR ratings have lower accounting conservatism.

In addition, in terms of the agency theory, the association between CSR and conditional conservatism is positive because of stakeholders' demand for accounting conservatism because it is considered to be an efficient contracting and corporate governance mechanism, leading to a higher level of CSR. Stakeholder theory provides an assumption for examining corporate responsibility performance it is recognized that an organization has relationships with stakeholders (Francis et al., 2013). This theory suggests that the greater the value attached to non-financial information by stakeholders, the better the quality of the information disclosed (Bowrin, 2018). From the perspective of the legitimacy theory, a company´s management is expected to undertake activities considered important by their stakeholders and to report on those activities to the stakeholders (Guthrie et al., 2006). Stakeholder and legitimacy theories are interrelated and that organizations, as part of their legitimation processes, voluntarily information disclosure (Guthrie et al., 2006).

In this context, previous research showed that socially responsible companies behave differently from other companies in relation to earnings management and financial reporting (Gao and Zhang, 2015). Furthermore, several studies state that CSR enhances financial statements transparency and then managers engage in fewer earnings management activities (Kim et al., 2012). According to Cho et al. (2020), previous studies on the relationship between accounting conservatism and CSR disclosure provide mixed evidence: While one stream of research suggests a negative relationship, another stream of research suggests a positive relationship. Kurniawan and Wibowo (2009) found that Indonesian banks are, in general, conservative in their financial reporting, but there is no clear evidence to support the relationship between conservatism and the Indonesian banks' CSR reporting. For Ball and Shivakumar (2005), accounting conservatism is an important element of financial information reporting quality as it enhances the relevance and faithfulness of the accounting information. Cho et al. (2020) found that: (1) the companies adopting conservative financial reporting are less likely to disclose CSR information; (2) the market reaction to companies' CSR disclosure is reduced when its financial reporting is more conservative; (3) the quantity and quality of CSR disclosures are associated with the degree of accounting conservatism. Furthermore, Langberg and Sivaramakrishnan (2008) argued that conservative financial reporting is associated with less precise information and more frequent voluntary disclosures.

Despite the differences in the sign (positive/negative), there is empirical evidence that the accounting conservatism and the CSR reporting variables are correlated. However, studies analyzing the significance of this relationship for the environmental information disclosure in annual and sustainability reports are scarce.

Environmental information disclosure, beyond the annual report, can be done using social reports and environmental reports (which tend to be integrated into sustainability reports) and integrated reports (Jastrzębska, 2016).

Regarding the annual report, the IFRS issued by IASB does not require recognition of environmental matters in the balance sheet and income statement. However, several authors in the existing literature mention the need for these financial statements to also contain relevant information of environmental nature (Raupp, 2001; Eugénio, 2004). According to paragraph 47 of Portuguese Financial Reporting Standards (IFRS 26), environmental information disclosure in the annual reporting is mandatory for companies that apply the local accounting standards, when these matters "are materially relevant for assessing the entity's performance or financial position." Information such as environmental policy, environmental management system (EMS), environmental protection measures, training, environmental audit, environmental performance, environmental investments, and other elements of an environmental nature must be disclosed in the management report. In the notes to the Financial Statements, regarding measurement criteria, environmental incentives, environmental expenditures, extraordinary costs, environmental liabilities, and contingent liabilities, should be reported.

Portuguese companies listed on the stock exchange do not apply IFRS 26. These companies apply the IAS/IFRS of the IASB. Based on this framework, Portuguese companies listed on the stock exchange are only required to disclose environmental information in the annual report if these matters are materially relevant for measuring the entity's performance or financial position.

Nevertheless, as the influence of environmental factors in the decision-making process increases day by day, the disclosure of non-financial information became mandatory as a result of the Directive 2014/95/EU. This Directive aims to enhance transparency in the disclosure of non-financial information, thus increases investor´s and stakeholder's confidence. Within the scope of this Directive larger firms (with an average number of 500 employees during the financial year) shall include in the annual reporting a non-financial statement containing information to the extent necessary for an understanding of the undertaking's development, performance, position, and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters (Article 19a). In Portugal, Decreto-Lei n 89(2017) transposes to the legal order the Directive 2014/95/EU, which is applied since the 1st of January 2018.

Indeed, given the growing concerns around sustainability issues, companies are increasingly disclosing environmental information in their reports (Barbosa et al., 2021). In this respect, Patten and Trompeter (2003) investigated the association between the level of pre-event environmental disclosure and earnings management. Their results show that, after the chemical leak at the Union Carbide plant in Bhopal, India in December 1984, a sample of 40 US chemical companies exhibited significant negative discretionary accruals for 1984, concluding that "companies with higher levels of pre-event environmental disclosures in their 10-K reports tended to take less negative discretionary accruals." Sun et al. (2010) analyzed, for a sample of 245 UK non-financial firms the relationship between corporate environmental disclosures in the annual reports and earnings management and find no significant statistical association between both variables. Gerged et al. (2020) investigated the correlation between corporate environmental disclosure in the annual reports and earnings management in firms listed on the Kuwaiti stock exchange from 2010 to 2014. Their results showed a significant and negative relationship between the studied variables. Based on a sample of firms (12,672) from 19 countries from 1994–2010, Li and Zaiats (2017) concluded that dual-class status is related to poorer environmental information in the annual reports and increased accrual-based earnings. Karsalari et al. (2017) results showed that the mandatory CSR components have a negative effect on the accounting conservatism in Tehran stock exchange companies.

Although there is not much information about environmental information disclosure in Portugal, the existing research is focused on: social responsibility disclosure on the Internet of the Portuguese listed firms (Branco and Rodrigues, 2005); Portuguese firms that adopt GRI guidelines (Roberts and Koeplin, 2007); analysis of sustainability reporting (SR) and assurance in Portugal (Gomes et al., 2015). In the environmental disclosure specific area, studies are scarce (Barbosa et al., 2021; Pucheta-Martínez et al., 2020; Dagiliene et al., 2020; Ribeiro and Aibar-Guzman, 2010). However, existing research covers the level of disclosure and its determinants, but none includes the topic of earnings management or accounting conservatism.

In the case of Portuguese firms, we expect that the agency theory should prevail because CSR is in a very initial process. Therefore, within conditional accounting conservatism, we formalized the second hypothesis:

H2: The level of environmental disclosure in the annual report increases the conditional conservatism of Portuguese-listed firms.

According to Badia et al. (2020), non-financial reporting increases accountability and transparency and is a response to stakeholder expectations. Non-financial reports are prepared based on standards or guidelines by different organizations, such as the International Organization for Standardization (ISO), Global Reporting Initiative (GRI), United Nations (UN), International Labour Organization (ILO), and International Integrated Reporting Council (IIRC) (Monteiro et al., 2021). In prior studies, the GRI framework was the most widely used in the preparation and dissemination of non-financial information (English and Schooley, 2014). This framework contributes to improving the quality of non-financial information (Fernandez-Feijoo et al., 2014; Boiral et al., 2019). Regarding the environmental dimension of sustainability, GRI standards have 34 indicators related to expenses, such as raw materials, energy and water, air emissions and waste, and the impact on biodiversity. Therefore, we expected that firms that follow GRI standards would exhibit more detailed sustainability information, which also presents higher quality.

Theoretically and empirical studies showed that the level of voluntary information disclosures in the CSR report and their credibility vary depending on the degree of financial reporting conservatism (Cho et al., 2020). Cho et al. (2020) found that market reaction to a firm's CSR reporting is reduced when its financial information reporting is more conservative. Gerged et al. (2020) indicated that companies with high-environmental information disclosure seem to be more conservative in accounting decisions, providing more accurate earnings-related information to their stakeholders. Based on these studies we formalized the third hypothesis:

H3: The level of environmental disclosure in the sustainability reports increases the conditional conservatism of Portuguese-listed firms.

3. Empirical research design

3.1. Data and sample selection

In this study, we selected listed firms because these firms tend to disclose more environmental information than others (Monteiro et al., 2010). Thus, the initial sample consisted of the 43 Portuguese firms listed on the Euronext Lisbon. However, we excluded the firms that have not been traded on the stock market for more than three months and the sportive corporations (FC Porto SAD, SL Benfica SAD, and Sporting CP SAD). After these selecting procedures, the final sample contained 30 firms, which represent 70% of Portuguese-listed firms. Table 1 documents the firms included in the sample.

Table 1: Sampled firms

Altri	Media Capital
Banco Comercial	Mota Engil
Cofina	NOS
Corticeira Amorim	Novabase
CTT Correios	Orey Antunes
EDP	Pharol
EDP Renováveis	Ramada
Estoril Sol Casinos	Ren
Galp Energia	Semapa
Glintt	Sonae
Ibersol	Sonae Indústria
Impresa	Teixeira Duarte
Inapa Inv.Gestão	Toyota Caetano
Jerónimo Martins	The Navigator Company
Martifer	Vista Alegre

Data was collected from 2015 to 2017 the annual and sustainability reports of the firms included in the sample because environmental information disclosure was collected during that period. In addition, we also used data from 2014 due to the lagged variable for net income to estimate the regressions of Ball and Shivakumar (2005). We used the database SABI to obtain general and financial information.

3.2. Measures of environmental information disclosure

The level of environmental disclosure was measured using a disclosure-scoring index based on Wiseman (1982). This index allowed us to measure the level of the environmental disclosure in a firm's reports through the use of a dummy variable, in which a given indicator is set to one if a specific item is released, and zero if the item is not reported. This technique was widely used in prior studies, namely by Clarkson et al. (2008), Huang and Kung (2010), Monteiro et al. (2010), Rao et al. (2012), and Pucheta-Martínez et al. (2020).

In this study, we computed two Environmental Disclosure Indices (EDI) based on Wiseman's Classification: The EDIAR, which measures the level of environmental disclosure in annual reporting, and the EDISR, which gives the level of environmental disclosure in voluntary reporting, specifically in the sustainability reporting.

The EDIAR consists of 14 indicators following the Monteiro et al. (2010) study, which are mentioned in paragraphs 48 and 49 of NCRF 26 (active until 2016 and concurrent with the sample period). These indicators result in form information that shall be disclosed on the management reporting (8 items) and notes to financial statements (6 items). In total, we used the 14-item checklist to determine if the information related to these different aspects of environmental concern is present or absent from the annual reporting. Table 2, panel A contains the 14 indicators.

Regarding EDISR, the 34 indicators (EN1-EN34) selected indicators followed the GRI guidelines (G4). They are grouped into 12 categories and (Table 2, panel B). We used the 34-items checklist to determine the presence or absence of environmental information in the sustainability reporting.

The EDI is computed by the following equation:

$$EDI_n = \sum_{n=1}^{e} \frac{ej}{e}$$

where, ej–Number of indicators included on the reporting; e–Total number of indicators.

When one indicator is disclosed it is set to 1; otherwise, it is set to 0.

3.3. Measures of conservatism

To estimate conditional conservatism, we took into account the approach proposed by Basu (1997). This measure uses the regression of earnings per share on stock returns, to capture the timeliness of earnings in relation to the news. Stock prices may explain earnings because they reflect information from several different sources, so they are expected to lead earnings. Stock return is a proxy that reflects bad news if it is negative and good news if it is positive. To capture the asymmetric timeliness of earnings in relation to bad news the regression includes a dummy variable that identifies bad news.

Given that we wanted to focus on accounting information, we used the modified Basu regression proposed by Ball and Shivakumar (2005). These authors relied on the asymmetric persistence of earnings changes, which implies that under conservative accounting practices, the bad news is recognized more quickly than good news. Further, under conservative accounting practices, decreases in earnings in any given period are less persistent and more likely to reverse in future periods. Therefore, the regression defined by Ball and Shivakumar (2005) is:

$$\Delta NI_{i,t} = \beta_0 + \beta_1 D\Delta NI_{i,t-1} + \beta_2 \Delta NI_{i,t-1} + \beta_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \varepsilon_{i,t}$$

Where, ΔNI gives the change in the net income scaled by the beginning of the year total assets; $D\Delta NI$ is a dummy variable that takes the value one when the change in net income in the prior year is negative and zeroes otherwise.

Table 2: EDIAR and EDISR

Panel A		
Variable	Management Reporting	Notes
EDIAR	Environmental Policy Environmental management system (EMS) Environmental protection measures Training Environmental audit Environmental performance Environmental Investments Other elements of an environmental nature	Measurement criteria Environmental incentives Environmental expenditures Extraordinary costs Environmental liabilities Contingent liabilities
Panel B		
Variable	GRI guidelines categories (indicators)	
EDISR	Materials (EN1-EN2) Energy (EN3-EN7) Water (EN8-EN10) Biodiversity (EN11-EN14) Emissions (EN15-EN21) Effluents and Waste (EN22-EN26)	Products and Services (EN27-EN28) Compliance (EN29) Transport (EN30) General (EN31) Supplier Evaluation (EN32-EN33) Environmental Complaints (EN34)

In this model, timely recognition of gains reflects a persistent increase in income, that tends not to reverse in the following period, which is consistent with a negative coefficient, ($\beta_2 = 0$). In the case of losses, the dummy variable ($D\Delta NI$) is equal to one so the coefficient that accounts for reversal is the sum ($\beta_2 + \beta_3$). Therefore, timely recognition of losses implies this sum is negative ($\beta_2 + \beta_3 < 0$). Finally, if losses are recognized more timely than gains ($\beta_3 < 0$), then this last condition reflects a conservative accounting practice.

3.4. Regressions specification of environmental disclosure effect on conditional conservatism

To tests the effect of environmental disclosure on conditional conservatism we estimated the following modified regression of Ball and Shivakumar (2005):

$$\Delta NI_{i,t} = \beta_0 + \beta_1 D\Delta NI_{i,t-1} + \beta_2 \Delta NI_{i,t-1} + \beta_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \text{DEDI} * (\beta_4 + \beta_5 D\Delta NI_{i,t-1} + \beta_6 \Delta NI_{i,t-1} + \beta_7 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1}) + \varepsilon_{i,t}$$

where, DEDI is a dummy variable that is set to one if the EDI of a given firm is higher than the mean value, and zero otherwise.

The coefficient that captures the incremental effect of environmental disclosure on conditional conservatism is β_7. If conditional conservatism increases due to environmental information, then β_7 is expected to be negative.

Some authors argue that unconditional conservatism is negatively related to future conditional conservatism because unconditional conservatism reduces the proportion of assets subject to conditional conservatism (Roychowdhury and Martin, 2013; Beaver and Ryan, 2000). Therefore, these authors employ the market-to-book (MTB) ratio to estimate unconditional conservatism, given that asset write-downs increase the MTB. Therefore, the beginning-of-period MTB is negatively associated with conditional conservatism over the period. Therefore, we modified the Ball and Shivakumar (2005) regression by including MTB.

4. Results and discussion

4.1. Descriptive statistics

We begin this section by analyzing the industries included in our sample. For that purpose, Table 3 lists the absolute number and relative frequency of firms by industry sorted by their relative position on the total sample. As we can see, the main representative industries are the Services, Manufacture and Basic materials industries, representing 73.4% of the firms analyzed. Besides, 40% belong to the industries considered environmentally critical, namely energy, paper pulp, oil, and gas.

Table 3: Number of firms by industry and their relative position

Industry	Absolute frequency (n)	Relative frequency (%)
Services	9	30.0
Manufacture	8	26.7
Basic materials	5	16.7
Electricity	3	10.0
Technology	2	6.7
Business	1	3.3
Oil and gas	1	3.3
Telecommunication	1	3.3
Total	30	100%

As shown in Table 4, from the eight industries included in this study, only firms in the Technology, Services, and Basic Materials increased the environmental information disclosure in the annual reports from 2015 to 2017. However, all firms disclosed environmental information on the annual reporting except for Telecommunication in 2017. By contrast, in 2015 and 2016 only 70% of the firms disclosed environmental information on annual reports.

As shown in Table 5, we found an increase in sustainability reporting disclosure of 55.6% from 2015 to 2017. More specifically, the number of companies with sustainability reporting disclosure rose from 9, in 2015, to 14, in 2017, and from 7, in 2016, to 14, in 2017. This evidence is consistent with a greater commitment to disseminate information about social responsibility and sustainable development to stakeholders.

Table 4: Absolute frequency (n), relative frequency (%) and evolution of the disclosure of environmental information in annual reports by sector of activity, from 2015 to 2017

Industry	Absolute frequency	2015		2016		2017		Variation rate
	(n)	n	%	n	%	n	%	(2015-2017)
Services	9	6	66.7%	7	77.8%	9	100%	49.9%
Manufacture	8	7	87.5%	6	75%	7	87.5%	0%
Basic materials	5	3	60%	3	60%	4	80%	33.3%
Electricity	3	3	100%	3	100%	3	100%	0%
Technology	2	0	0%	0	0%	2	100%	200%
Finance	1	1	100%	1	100%	1	100%	0%
Oil and Gas	1	1	100%	1	100%	1	100%	0%
Telecommunication	1	0	0%	0	0%	0	0%	0%
Total	30	21	70%	21	70%	27	90%	28.6%

Table 5: Absolute frequency (n), relative frequency (%), and evolution of sustainability reports disclose from 2015 to 2017

Sustainability reports	2015		2016		2017		Mean		Variation rate
	n	%	n	%	n	%	n	%	(2015-2017)
Disclose	9	30%	7	23.3%	14	46.7%	10	33.3%	55.6%
Not disclose	21	70%	23	76.7%	16	53.3%	20	66.7%	-23.81%
Total	30	100%	30	100%	30	100%	30	100%	

More specifically, the EDIAR decreased by 4.6% from 2015 to 2016, but an increase of 20.13% from 2016 to 2017, resulting in an overall positive change of 14.6%, during the sample period. The EDISR exhibited a positive change of 25.8% from 2015 to 2017. This evidence suggests that firms tend to disclosure more environmental information on specific and voluntary reports than in the annual reports. Table 6 shows this evidence.

Table 6: Evolution of EDI

EDI	2015	2016	2017
EDIAR	0.33	0.32	0.38
EDISR	0.30	0,31	0.39

Table 7 summarizes descriptive statistics made for some variables used to estimate the regressions of Ball and Shivakumar (2005). While the values for EDIAR are similar to the EDISR values, the latter is slightly higher than the former.

For example, the mean value for the environmental disclosure index based on sustainability reporting is 34% while it is 33% it relies on the annual reporting. In terms of changes in net income, with an increase close to 2.6% in mean, although with a high standard deviation resulting from some firms with a dramatic decrease in net income while other firms exhibit a strong increase. The mean of MTB is 1.428 suggesting that write-downs in assets are not expected for the majority of the firms following the arguments of Lawrence et al. (2013).

Table 7: Descriptive statistics

Variable	Obs.	Mean	Std.	Median	Min	Max
EDIAR	90	0.331	0.264	0.333	0	0.833
EDISR	90	0.344	0.265	0.400	0	0.933
Δ NI/Total Asset	90	0.026	0.660	0.003	-2.767	5.401
MTB	80	1.428	1.457	1.265	-4.965	5.692

4.2. Regression analysis

In this study, we used a panel data structure to estimate the regressions with time fixed effects to control for econometric issues resulting from the lagged net income following Ball et al. (2013).

Table 8 shows the results of regression estimations. These results suggested that the Portuguese listed companies analyzed exhibit a conditional conservative accounting practice, after controlling for MTB, the coefficient β_3 (MTB) is negative and statistically significant at a one percent level. Furthermore, when we included in the regressions the dummy variable for environmental disclosure level, the coefficient β_3 remained statistically significant and with a negative sign. Therefore, these results showed that the Portuguese-listed firms analyzed tend to exhibit a conservative accounting practice even after including the control variable MTB and the explanatory variables related to environmental disclosure. These results are consistent with the first hypothesis (H1) of this study, that Portuguese listed firms exhibit a conservative accounting practice. Our results are in line with what was expected, considering that previous studies indicate that companies from continental Europe tend to be more conservative in reporting information (Gray, 1988; Feleagă et al., 2010).

Regarding the specific effect of environmental information disclosure on conditional conservatism, our evidence is not consistent with that expected. In fact, when we analyzed the EDI based on annual reporting, the coefficient that gives the incremental impact (β_7) was not statistically significant even after controlling for MTB. Therefore, this evidence does not confirm the second hypothesis (H2), that the level of environmental disclosure in the annual report increases the conditional conservatism of Portuguese-listed firms. This may be due to IFRS not requiring for recognition of environmental matters in the balance sheet and income statement. Therefore, annual reporting may not be the best means to analyze CSR activities and it is likely to be associated with financial disclosure rather than environmental disclosure.

When we analyzed the EDI based on voluntary reporting, β_7 becomes statically significant but with a negative sign. Therefore, this result suggests an increase in the level of conditional conservatism when the environmental disclosure in voluntary reporting is high. This result is in line with managers engaging in a more conservative accounting practice in order to meet stakeholders' expectations. Actually, this evidence supports our second hypothesis that relies on the agency theory rather than on the legitimacy theory.

These results supported our third hypothesis (H3), the hypothesis that the level of environmental disclosure in the sustainability reports increases the conditional conservatism of Portuguese-listed firms. This conclusion is in line with Cho et al.'s (2020) study that suggested that the level of voluntary information disclosures in the CSR report depending on the degree of financial reporting conservatism.

In addition, in this study, we verified that the effect of environmental disclosure on accounting conservatism is higher for the sustainability reporting rather than in the annual reporting.

Table 8 reports the results for the regressions of Ball and Shivakumar (2005) and for modified regressions:

$$\Delta NI_{i,t} = \beta_0 + \beta_1 D\Delta NI_{i,t-1} + \beta_2 \Delta NI_{i,t-1} + \beta_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \varepsilon_{i,t}$$

$$\Delta NI_{i,t} = \beta_0 + \beta_1 D\Delta NI_{i,t-1} + \beta_2 \Delta NI_{i,t-1} + \beta_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \mathrm{DEDI} * (\beta_4 + \beta_5 D\Delta NI_{i,t-1} + \beta_6 \Delta NI_{i,t-1} + \beta_7 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1}) + \varepsilon_{i,t}$$

(ΔNI) gives the change in net income scaled by the beginning of year total assets; ($D\Delta NI$) is a dummy variable that takes the value one when the change in net income in the prior year is negative and zeroes otherwise; (DEDI) is a dummy variable that is set to one if the EDI of a given firm is higher than the mean value and zero otherwise.

Table 8: Accounting conservatism and environmental information disclosure

	β_3	$\beta_3(MTB)$	β_7	$\beta_7(MTB)$
Ball and Skivakumar	0.692***	-2.310***		
	(6.016)	(-2.991)		
Num. Observ.	82	74		
Adjusted R-square	0.392	0.570		
DEDIAR	0.641***	-2.879***	6.108	-146.732
	(5.544)	(-4.203)	(-0.070)	(-0.307)
Num. Observ.	81	73	81	73
Adjusted R-squa.	0.404	0.668	0.404	0.668
DEDISR	0.643***	-2.841***	-2.416***	4.393
	(5.525)	(-3.972)	(-0.029)	(0.012)
Num. Observ.	81	73	82	73
Adjusted R-squa.	0.400	0.644	0.401	0.644

Notes: ***, **, * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. t-statistics are presented in parentheses

5. Conclusion

Accounting conservatism, according to Francis et al. (2013), refers to the idea that "gains should be deferred and losses should be accelerated." More recent research is focused on the relationship between CSR and accounting conservatism (Francis et al., 2013; Anagnostopoulou et al., 2020).

In this study, we investigated whether the degree of environmental responsibility in firms affected the level of conditional conservatism. We found evidence that Portuguese-listed firms tend to be accounting conservative even after controlling for unconditional conservatism, which is consistent with a Continental European accounting system. In addition, our results suggested that these firms still engage in accounting conservative practices when they are committed to environmental information disclosure. This is in line with the demand for more transparency by shareholders and with more ethical behavior by managers.

Concerning the specific effect of environmental information disclosure on conditional conservatism, our results suggested that this effect is higher when the disclosure relies on voluntary reporting. In fact, we found evidence of a negative effect on the level of accounting conservatism using an index based on voluntary environmental information disclosure, and a lack of significant impact when this is disclosed on the mandatory reporting. Besides, the results are consistent with a more conservative accounting practice when the voluntary environmental information disclosure increases. This evidence is in line with the agency theory argument that managers aim at responding to stakeholders' demand for accounting conservatism because it is considered to be an efficient contracting and corporate governance mechanism. Therefore, these results suggested that firms more socially responsible tend to have higher conditional conservatism.

Overall, our results showed that Portuguese-listed firms are accounting conservatively, although this conservatism tended to decrease when the firms exhibited higher levels of voluntary environmental information disclosure. This result is consistent with more transparent financial reporting resulting from higher CSR. Thus, our study covers an existing gap in the literature, given that it relates to accounting conservatism and the level of environmental information disclosure in Portuguese companies.

The main limitations of this study concern the sample and considering only the extent of dissemination of environmental information, neglecting its quality. We aim to further develop this work by increasing the number of firms in our sample analysis, which also may imply the use of a different index for sustainability information reporting and disclosure. As a concluding remark, we must say that our findings can be useful for a number of economic agents including investors in general, managers, policymakers, academics, and society as a whole.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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