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**SUSTAINABILITY PERFORMANCE AND EARNINGS
MANAGEMENT-EVIDENCE FROM THE EUROZONE**

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Ευχαριστίες

Με την εκπόνηση της παρούσας διπλωματικής εργασίας, θα ήθελα να ευχαριστήσω θερμά την επιβλέπουσα καθηγήτριά μου, κα. Σεραΐνα Αναγνωστοπούλου, για τη στήριξη και παροχή πολύτιμων κατευθυντήριων οδηγιών και επισημάνσεων, συμβάλλοντας καθοριστικά στη διεκπεραίωση της. Επίσης, θα ήθελα να ευχαριστήσω τον υπεύθυνο εργαστηρίου του Τμήματος Χρηματοοικονομικής και Τραπεζικής Διοικητικής, κ. Λάζαρο Αμανατίδη, για την καθοδήγησή του κατά την εξαγωγή των δεδομένων της εμπειρικής έρευνας.

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Περίληψη

Σκοπός της παρούσας διπλωματικής εργασίας είναι να εξετάσει την επίδραση της Επίδοσης της Εταιρικής Αειφορίας (Corporate Sustainability Performance) στη χειραγώγηση κερδών των εταιριών, στο επίπεδο της Ευρωζώνης. Κίνητρο της έρευνάς μας αποτελεί η τάση των εταιριών τα τελευταία 30 χρόνια να ενσωματώνουν και να προωθούν τις Αρχές της Εταιρικής Κοινωνικής Ευθύνης (ΕΚΕ) (Ioannou & Serafeim, 2015), καθώς και οι λόγοι που την υποκινούν. Βασιζόμενοι σε προηγούμενη έρευνα, επιθυμούμε να εξετάσουμε αν η υιοθέτηση πρακτικών που ενισχύουν την αειφόρο ανάπτυξη, συμβάλλει στη διαφάνεια και την ενισχυμένη λογοδοσία των εταιριών ή εξυπηρετεί ωφελμιστικούς σκοπούς της Διοίκησης.

Για την κατασκευή του μοντέλου μας, όσον αφορά στη μέτρηση της χειραγώγησης των κερδών, χρησιμοποιούμε τρεις μεθόδους, καθώς και παραλλαγές αυτών: μέθοδος χειραγώγησης κερδών με βάση τα λογιστικά δεδομένα με τα μοντέλα των Jones (1991), Dechow et al. (1995) και Kothari et al. (2005), μέθοδος μέτρησης της ποιότητας των κερδών μέσω της απευθείας μέτρησης της ποιότητας των λογιστικών δεδομένων σύμφωνα με τα μοντέλα των Dechow and Dichev (2002) και McNichols (2002), και τέλος, μέθοδος χειραγώγησης κερδών με βάση τις πραγματικές λειτουργικές επιλογές με το μοντέλο του Roychowdhury (2006). Για τη μέτρηση της Επίδοσης Εταιρικής Αειφορίας λαμβάνουμε υπόψη την κοινωνική και περιβαλλοντική διάσταση της εταιρίας και την ορίζουμε στη βάση σχετικής βιβλιογραφίας (Hummel & Ising, 2015; Lys et al., 2015; Manning et al., 2019). Παράλληλα, παραμετροποιούμε το μοντέλο μας εισάγοντας μεταβλητές που έχει αποδειχθεί ότι επιδρούν στην επίδοση της εταιρίας καθώς και μεταβλητές που συσχετίζονται με ζητήματα της εταιρικής αειφορίας. Τα ευρήματά μας είναι ισχυρά και υποδεικνύουν ότι η Επίδοση της Εταιρικής Αειφορίας είναι αρνητικά και στατιστικά σημαντικά συνδεδεμένη με τη χειραγώγηση των κερδών, μετρημένη και με τις τρεις μεθόδους. Το γεγονός αυτό καταδεικνύει ότι η έμφαση στη βιώσιμη ανάπτυξη από τις εταιρίες συνοδεύεται από ενισχυμένη διαφάνεια, λογοδοσία απέναντι στα ενδιαφερόμενα μέρη και αξιοπιστία της δημόσιας λογιστικής πληροφόρησης.

Για τη διεξαγωγή της εμπειρικής έρευνας χρησιμοποιήθηκε ένα δείγμα 3.090 εισηγμένων εταιριών που ανήκουν σε χώρες της Ευρωζώνης και ακολουθούν τα πρότυπα IFRS τουλάχιστον για μία χρονιά την χρονική περίοδο από το 2005 έως και το 2020. Από αυτό το δείγμα προέκυψαν συνολικά 32.214 παρατηρήσεις. Τα δεδομένα αντλήθηκαν από τις Βάσεις Δεδομένων Worldscope (λογιστικά στοιχεία) και Datastream και ESG Refinitiv (στοιχεία πάνω σε εταιρική αειφορία).

Λέξεις Κλειδιά: Επίδοση Εταιρικής Αειφορίας, Εταιρική Κοινωνική Ευθύνη, ποιότητα λογιστικής πληροφόρησης, χειραγώγηση κερδών με βάση τα λογιστικά δεδομένα, ποιότητα κερδών, ποιότητα των λογιστικών δεδομένων, χειραγώγηση κερδών με βάση τις πραγματικές λειτουργικές επιλογές

Abstract

The purpose of our thesis is to examine the impact of Corporate Sustainability Performance on earnings management from listed firms of the Eurozone. Motivation for our research is the observed trend from firms to incorporate and promote the principles of Corporate Social Responsibility (CSR) the last thirty years (Ioannou & Serafeim, 2015) in combination with the purposes inciting it. Based on past research, we desire to examine if the adoption of practices compatible with and supportive of sustainable development, contributes to transparency and increased disclosure or serves managerial opportunism.

For the construction of our model, regarding measuring earnings management, we make use of three methods, as well as variations of them: method of accrual-based earnings management under the models of Jones (1991), Dechow et al. (1995) and Kothari et al. (2005), method of measuring earnings quality through measuring the quality of accruals under the models of Dechow and Dichev (2002) and McNichols (2002), and finally, the method of real earnings management under the model of Roychowdhury (2006). For the measurement of Corporate Sustainability Performance, we consider the social and environmental dimension of the firm and define it on the basis of relative literature (Hummel & Ising, 2015; Lys et al., 2015; Manning et al., 2019). We also set parameters in our models including variables that have an impact on firm performance as well as variables associated with corporate sustainability issues. Our findings are strong and indicate that Corporate Sustainability Performance is negatively and statistically significantly linked to earnings management for all three methods of measuring it. From our results it can be inferred that the orientation in sustainable development from firms is accompanied by enhanced transparency, accountability to stakeholders and validity of public financial reporting.

For our research purposes, we used a sample of 3,090 listed companies from the Eurozone following IFRS at least for a year for the period between 2005 and 2020, concluding to 32,214 firm-year observations. Data were extracted from Databases Worldscope (accounting data), and Datastream and ESG Refinitiv (corporate sustainability data).

Keywords: Corporate Sustainability Performance, Corporate Social Responsibility, financial reporting quality, accrual-based earnings management, earnings quality, accruals quality, real earnings management

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1. Introduction

The objective of Financial Accounting is to provide financial information to the stakeholders making decisions outside the economic entity, such as investors, creditors, the government and the public (Harrison et al., 2018). Such information should be tailored to the needs of the decision-makers and accurately depict the economic activities the entity pursues. The disclosure of financial information to the public occurs through Financial Statements and is mandatory for listed entities. For the accounting data to be internationally comprehensible and comparable, the Financial Statements should follow the International Financial Reporting Standards (IFRS) principles, set by the International Accounting Standards Board (IASB). Thus, many countries have developed generally accepted accounting principles (GAAP), such as U.S. GAAP. However, our research purposes are restricted to IFRS. The latter aims to effectuate “transparency, accountability and efficiency to financial markets around the world” (IFRS, 2021).

Financial reporting mainly focuses on the performance of entities, measured by earnings and its components (FASB, 1978, *SFAC No. 1, para 43c*), as pointed out by Dechow and Skinner (2000). Despite the improvements that have been made through the years for qualitative and credible financial information, literature extensively refers to practices implemented by companies regarding earnings manipulation (Beneish, 1999; Dechow et al., 1996; Dichev et al., 2013). The latter is based on the flexibility of accounting standards that allows managers to exercise their discretion at accounting choices with or without restrictions (Watts & Zimmerman, 1990), in order to mislead stakeholders and meet specific contractual goals in what has to do with the reported earnings (Healy & Wahlen, 1999). Opportunistic earnings management is widely employed (e.g., Cheng & Warfield, 2005; Cohen et al., 2008; Graham et al., 2005) and constitutes a key indicator of poor financial reporting quality. In conjunction with the disclosure of accounting scandals regarding reported earnings of prominent companies, such as Enron and Parmalat, earnings management also raised practitioners’ and regulators’ attention (Roychowdhury, 2006).

In light of the above, corporate culture theory (Murray & Montanari, 1986) proposes that socially responsible firms do not proceed to earnings manipulation practices (Yoon et al., 2021). In this sense, corporate sustainability performance (CSP) lies in the adoption of business strategies that consider the economic, social and environmental impact of corporate decisions, and thus follows the principles of Corporate Social Responsibility (CSR) (Hummel & Ising, 2015; Yoon et al., 2021). CSR is linked to transparency and enhanced financial disclosure (Bozzolan et al., 2015). CSR-oriented firms are expected to be legal, ethical and good corporate citizens, serving social purposes (Gao & Zhang, 2015). They are also long-term oriented, aiming to create value for shareholders (Chih et al., 2008). Thus, CSP is consistent with the legitimacy and stakeholder theory (Hummel & Ising, 2015). However, some researchers (Gargouri et al., 2010; Prior et al., 2008) propose that CSP is positively linked to earnings management. They argue that CSP is used as a tool to window-dress private benefits arising from commitment to a variety of stakeholders (Prior et al., 2008), to mask improper corporate behavior (Hemingway &

Maclagan, 2004) and to justify shareholders' value decrease (Kim et al., 2012). Considering the contradicting theories as well as the growing interest from firms to effectuate a high social and environmental impact towards their business practices (Eccles et al., 2014; Ioannou & Serafeim, 2015) motivates us to examine the Corporate Sustainability Performance (CSP)-earnings management link for the Eurozone.

We explicitly select listed firms from the Eurozone capital market to examine the CSP-earnings management link for two reasons. According to a recent literature review of the bidirectional relationship between CSR and earnings management (Velte, 2020), research has been focused on how CSR is linked to earnings management mainly in US-American firms. Although most of these studies indicate a negative relation, the ones with contrary findings (e.g., Chih et al., 2008; Gargouri et al., 2010; Prior et al., 2008) are not to be overlooked. Considering also that earnings management behavior is affected by investor protection regulations which vary across countries (Leuz et al., 2003), results from past research is not to be generalized for the Eurozone. This is also supported by the institutional differentiations between USA and Europe (Hummel & Ising, 2015). To our knowledge, there is a similar study examining European companies, but only for 713 firms during 2010-2011 (Hummel & Ising, 2015), while ours is the first to specify in the Eurozone with a relatively larger sample of 3,090 firms during 2005-2020. We choose 2005 because it is the year when IFRS adoption became mandatory for publicly listed companies that publish consolidated financial statements in the European Union. We only examine firm-year observations following IFRS for uniformity purposes.

We are also motivated by the fact that after the global financial crisis of 2007-2009 and the following debt crisis of the Eurozone, the initiation of Directive 2013/34/EU and Directive 2014/95/EU, referring to financial and non-financial reporting respectively, enhanced the quality and transparency of reported accounting information in the European Union (EU) (Hummel & Jobst, 2021). More specifically, with the implementation of Non-Financial Reporting Directive (NFRD) in 2018 for all EU countries, large, listed firms are obliged to publicize the impact of their business activities on environment and society, choosing the reporting standards at their discretion. Furthermore, some other regulations regarding sustainability-related disclosures have also been initiated, namely the Sustainable Finance Disclosure Regulation (SFDR) in 2019 and the EU Taxonomy Regulation in 2020 (Hummel & Jobst, 2021). However, in light of the fact that non-financial reporting regarding sustainability remains unstandardized and thus incomparable in EU, the European Commission (EC) (EC, 2021) introduced in April 2021 its proposal for a Corporate Sustainability Reporting Directive (CSRD) as an amendment of NFRD and in line with Global Reporting Initiative (GRI) Standards, the most frequently used standards in EU (EFRAG, 2021). The proposal suggests stricter reporting requirements as well as audit of the reported information. Thus, with the transparency and validity of sustainability reporting being doubted, we are intrigued to further examine whether and how the sustainability performance of public firms from the Eurozone is linked to earnings distortion.

For the measurement of earnings management, we employ three different models and variations of these models: these refer to the measurement of accrual-based earnings management (AEM), the accounting quality via the estimation of the quality of accruals, and the measurement of real earnings management (REM). For the detection of AEM which is defined with reference to the existence of discretionary accruals, as opposed to normal accruals, we employ the models of Jones (1991), modified Jones (1991) by Dechow et al. (1995) and ROA-adjusted Jones model (1991) by Kothari et al. (2005). In order to test for the quality of accruals, defined in the way in which they translate (or not) into current, lagged and future cash flows, we use the model of Dechow and Dichev (2002) and its augmented form as suggested by McNichols (2002). For real earnings management, we employ a composite measure considering the existence of any abnormal cash flows, discretionary expenses and production costs (all of which representing indications of earnings management through real activities manipulation) using the model by Roychowdhury (2006). As for sustainability performance, we measure it in the form of a composite score of how efficiently the firms serve environmental and social concerns through their business practices, in order to generate long-term shareholder value. The measure, following previous studies (Lys et al., 2015), is a combined construct of Social Pillar Score (SOSCORE) and the Environment Pillar Score (ENSCORE) provided in ESG Refinitiv Database (formerly ASSET4). Additional measures associated with sustainability performance and earnings management are included in our models for completeness purposes (Kim et al., 2012; Lev et al., 2010). Particularly, we use corporate governance behavior and the choice to issue a CSR Report, as well as various control variables widely used in common research (Bozzolan et al., 2015; Cho & Chun, 2016).

Our initial data sample consists of 32,214 firm-year observations, while the sample used for final estimations counts 5,137 firm-year observations. The results of our findings strongly indicate that CSP eliminates earnings management practices, with the statistically significant and negative link being consistent with all earnings management proxies and their variations. Particularly, sustainability performance is negatively associated with AEM, accruals quality and REM. Thus, our results are consistent with the stakeholder theory and in line with previous studies (Hong & Andersen, 2011; Hummel & Ising, 2015; Kim et al., 2012; Labelle et al., 2010). The impact of corporate governance performance on earnings management presents contradictory results, while CSR Reporting has no statistically significant impact on earnings management. However, additional tests on CSR Reporting indicates it being positively and significantly affected by CSP. This implies that the higher the sustainability performance is, the higher the probability is for firms to issue a CSR report, even if they do not have to, as our sample covers not only large firms that are obliged to issue a CSR report according to the NFRD.

Our study further connects earnings management with financial variables, such as performance and leverage level. As earnings management is a key indicator of poor-quality financial reporting and CSP is negatively associated with earnings management, as our results show, it can be inferred that CSP gives useful illustration to outsiders regarding firm's accountability and transparency in financial reporting.

The remainder of this thesis is organized as below. The second section presents related literature concerning earnings management, Corporate Sustainability performance and their interconnection, leading us to the hypothesis development of our research. The third section includes the description of data sample, the research design, an analysis of both the dependent and independent variables used and the construction of the models. The fourth section reports and overviews the descriptive statistics and the results from the estimation of regressions. The fifth section summarizes our empirical findings.

2. Related Literature, motivation and hypothesis development

2.1. Earnings Management

2.1.1. Definition

The existing bibliography provides a variety of earnings management definitions based on how researchers perceive its meaning. According to Schipper (1989), earnings management refers to the deliberate intercession from executives in how Financial Statements are disclosed to the public. It is not restricted to the reported earnings but lies in different parts of financial information, as a perception of the accounting numbers. The intent of such practices is private profit. Accordingly, Watts and Zimmerman (1990) define earnings management as the discretion managers have in accounting choices with or without restrictions. The latter is set mainly by contracting parties for firm value maximization. Managers exercise discretion when it results in profit for either the company and the contracting parties, as called “*opportunism*”, or for the company against contracting parties.

Healy and Wahlen (1999) support the following definition: “*Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.*” They refer to essential accounting practices that are liable to judgment. These practices entail depreciation and amortization methods, pension provisions, taxation issues and contingent liabilities regarding losses. Inventory valuation methods, working capital formation such as through defining the inventory levels, deferment of expenditures like advertising and modification of business activities according to needs, are some aspects indicative of judgement. As for misleading stakeholders, Healy and Wahlen (1999) explain that it occurs when the outsiders either accept earnings management or cannot perceive its occurrence. They also add another perspective on reporting judgment, which they do not mention in their definition. Managers use it for informative purposes so that accounting data reflects the appropriate signals for the outsiders.

As a form of earnings management, the managers’ interference in operational activities is also supported by Roychowdhury (2006). Fudenberg and Tirole (1995) refer to income smoothing through price reduction, delivery timing modifications and acceleration or

deceleration of maintenance costs. Dechow and Skinner (2000) come to add to the latter the alteration in scheduling research and development (R&D) or advertising costs, as well as sales. At this point we should mention that earnings management shall not be related to accounting fraud. Purposeful exercise of accounting discretion based on accepted principles differs from following deceitful accounting practices, such as realizing non-existent sales or inventory (Dechow & Skinner, 2000; Park & Shin, 2004; Ronen & Yaari, 2008).

More recently, Callao et al. (2014) suggest their definition for earnings management, which we believe that summarizes the above, as follows: *“Earnings management is a purposeful intervention in financial reporting, designed to reach earnings targets by varying accounting practices. However, it is an action which takes place without necessarily violating accounting regulations, and which takes advantage of the possibilities of choice in accounting policy. The action may mislead stakeholders, causing them to make decisions on the basis of financial reports that they would not have made otherwise.”*

From the above definitions, it can be arisen that earnings management occurs when managers intervene in the process of accounting reporting, choosing between accounting methods, modifying the methods and adjusting the operating activities at their discretion. This is also what Park and Shin (2004) summarize as an explanation of the definition.

2.1.2. Relationship between Earnings Management with Earnings Quality

The existing literature provides no clear definition for earnings quality (Dichev et al., 2013; Penman & Zhang, 2002). Dechow et al. (2010) define earnings quality as: *“Higher quality earnings provide more information about the features of a firm’s financial performance that are relevant to a specific decision made by a specific decision-maker.”* They present three characteristics of their definition. First, earnings quality is determined by the selected decision model related to the underlying reported information. Second, it depends on it being informative regarding firm’s performance, from which not all aspects can be detected. Third, earnings quality is contingent on the relevance of the financial performance to the corresponding decision and the accounting systems’ ability to measure performance.

Lo (2008) proposes that highly managed earnings interpret low quality. From this, it cannot be inferred that lack of earnings manipulation signifies high-quality accounting numbers as quality is dependent upon many factors. However, hypothesizing other factors constant, there is a tight relation between earnings management and earnings quality. As Ball and Shivakumar (2008) state, high quality earnings lie in accounting conservatism, whereas low ones in income-increasing earnings management. Accounting conservatism occurs when bad news is recognized as losses timelier in comparison to good news being realized later. Thus, earnings increases are more persistent compared to earnings decreases, which have a tendency to reverse (Basu, 1997).

Penman and Zhang (2002) interpret earnings quality as to whether reported earnings before extraordinary items are a signal for future performance and thus, they positively connect the term with earnings sustainability. If managers engage in earnings management with short-term effects on firm performance and reverse these effects afterwards, then this inconsistent accounting behavior renders earnings of low quality. An example is the temporary lowering of bad debt provision estimates (Teoh et al., 1998). Though accounting conservatism that produces lower earnings is considered to result in high quality earnings, Penman and Zhang (2002) doubt it when a temporary change in investments is present. They define accounting conservatism as the selection of accounting methods that keep the book value of earnings relatively low, such as recognizing R&D costs as expenses rather than capitalizing and amortizing them. If the rate of return is to be altered only for a short-term period, then it falsely signals for future performance, and thus leads to low earnings quality, if investors do not discern the earnings unsustainability. Engagement of accounting conservatism in the temporary investment lowers earnings and rate of returns and produces unrecorded reserves. If the investment activity is to be seized after a while, the reserves are released and subsequently earnings and rate of returns are boosted. This temporary change in investments leads to low quality earnings. Dichev et al. (2013) also support that persistent and sustainable earnings are of high quality.

In the same context, Sloan (1996) documents that earnings persistence is negatively associated to the accrual component of earnings and positively to the cash flow component. Thus, the accrual part interprets low-quality earnings and the cash flow part high quality earnings. The author presents evidence that investors are based on earnings in order to value the firm and cannot discriminate between the accrual and the cash flow part of earnings. As such, firms with high levels of positive accruals are found to have weaker earnings performance the next three years as a result of underlying accruals' reversal. These firms also present negative abnormal stock returns over the next three years, attributable to the predictions for earnings decline. From this, it can be inferred that upwards accrual-based earnings management practices are connected to low earnings quality.

Beyer et al. (2019) find evidence that there is bias in reported earnings stemming from accounting misstatements. This bias is positively associated with investors' uncertainty. The uncertainty lies in information asymmetry between managers and investors and is invoked by the reporting bias. When reporting distortion is unobservable from investors, then earnings falsely signal for the firm value and thus are of low quality. This supports that it is difficult for investors to distinguish between fundamental and managed earnings (Dechow et al., 2010; Dichev et al., 2013).

Furthermore, earnings quality is associated with earnings management motivations. When managers exercise earnings management in order to enhance informativeness about firm's value, they improve earnings quality. On the contrary, if managers have

opportunistic incentives for earnings management with an intent to mislead outsiders about firm's performance, then earnings quality is lowered (Nelson & Skinner, 2013).

From the above it can be inferred that upwards earnings management (Ball & Shivakumar, 2008), reporting bias (Beyer et al. (2019) and opportunistic incentives for earnings distortion (Nelson & Skinner, 2013) signify poor earnings quality, whereas accounting conservatism (Ball & Shivakumar, 2008) and sustainable earnings signal for high earnings quality.

Methods for Measuring Earnings Management

According to existing academic research, there are three ways to manipulate earnings: accrual-based earnings management (AEM hereafter), real earnings management (REM hereafter) and classification shifting (CS hereafter). As Anagnostopoulou et al. (2021) state, the first two forms affect bottom-line reported earnings, whereas CS, that lies in the reclassification of recurring operating expenses as nonrecurring Special Items, affects the operating income upwards (McVay, 2006). AEM and REM have been widely identified and examined by researchers either separately for AEM (Dechow et al., 1995; Dechow & Skinner, 2000; Fields et al., 2001; Healy, 1985; Healy & Wahlen, 1999; Jones, 1991; Kothari et al., 2005; Phillips et al., 2003) and REM (Graham et al., 2005; Gunny, 2005; Roychowdhury, 2006) or together (Badertscher, 2011; Cohen et al., 2008; Cohen & Zarowin, 2010; Zang, 2012). CS is of standalone research and has been relatively recently examined by academic researchers commencing from McVay (2006) and having others following (Anagnostopoulou et al., 2021; Fan et al., 2010; Haw et al., 2011; Joo & Chamberlain, 2017).

For better comprehension of AEM, we present the definition of Accrual Accounting. On the basis of Financial Accounting Standards Board (FASB), it refers to the reporting of transactions, events or occasions that have cash effects on the entity when these occur, regardless of the period the cash inflows or outflows are recorded (FASB 1985; SFAC No.6, para 139). *“Accrual accounting uses accrual, deferral, and allocation procedures whose goal is to relate revenues, expenses, gains, and losses to periods to reflect an entity's performance during a period instead of merely listing its cash receipts and outlays...The goal of accrual accounting is to account in the periods in which they occur for the effects on an entity of transactions and other events and circumstances, to the extent that those financial effects are recognizable and measurable” (FASB, 1985; SFAC No.6, para 145).*

Schipper (1989) refers to AEM as the selection between accounting methods that comply with the Generally Accepted Accounting Principles (GAAP) and the adaptivity of the methods selected in order to modify reported earnings. Altering the useful life of a depreciable asset is a typical example. Similarly, AEM occurs when managers modify accounting methods or estimates regarding specific subsets of financial reporting. For instance, they change the depreciation method or adjust their estimates for doubtful accounts provisions (Zang, 2012), they decrease their provision for bad-debt expenses

and postpone asset write-offs (Roychowdhury, 2006) or choose between recognizing costs as expenses or capitalizing them (Fudenberg & Tirole, 1995). AEM is preferred from managers, especially for short-term earnings manipulation purposes, as it costs less than possible firm value-decreasing effects of suboptimal operating decisions. For example, deferment of R&D expenditures has an opportunity cost that may be translated into decrease of future income (McVay, 2006). What is more, accrual choices are less discernible from outsiders, compared to asset sales and accounting methods. Thus, it is more difficult for accruals to be subject to adjustment or withdrawal from external parties after the publication of Financial Statements (Young, 1999). In case that AEM is observed, it is challenging to prove it and cancel its effects, because of the limited information available (Botsari & Meeks, 2008).

REM lies in the decisions regarding the modification of operating activities and the timing an investment or financing occurs in order to manipulate reported earnings. For instance, it is the choice of the amount spent for R&D or advertising expenses (Schipper, 1989). Roychowdhury (2006) defines REM as deviations from normal operational activities with intent to make at least some stakeholders believe that company has beaten specific financial reporting targets through normal operations. She refers to extensive price or discretionary expenses' reduction as indicative examples and doubts that REM activities add firm-value; also supported by Zang (2012), who refers to suboptimal consequences for the company of REM activities. Selling fixed assets to boost earnings (Gunny, 2005) and adjustments in delivery or shipment time schedules (Fudenberg & Tirole, 1995) are also possible activities for engagement in REM. The survey of Graham et al. (2005) indicates that CFOs present extensive REM behavior. It has been found that 80 percent of the questioned CFOs would defer their discretionary expenses, such as R&D expenses and 55% of them would postpone commencing a new project even if this would have little decreasing value effects on the firm. The aim is to meet their short-term-oriented goals.

From the above-mentioned earnings manipulation methods some key characteristics of them can be inferred. AEM does not directly affect cash-flow operations as it does not change the underlying transaction (Zang, 2012), in contrast to REM that does so directly through the purposeful alteration of operational practices (Roychowdhury, 2006). REM decisions are managers' issue, while AEM practices depend upon auditors' acceptance and underlying accounting principles; a fact that creates uncertainty to the managers (Gunny, 2010; Kothari et al., 2016). Furthermore, although REM brings more long-term costs than AEM, it is favored as earnings manipulation method (Graham et al., 2005; Roychowdhury, 2006). Managers perceive that AEM is associated with relatively higher private costs, at least in the short term (Roychowdhury, 2006). The author explains it through the fact that AEM is more susceptible to close examination by auditors or regulators, widely supported by existing literature (Cohen & Zarowin, 2010; Gunny, 2010; Kothari et al., 2016; Zang, 2012). Similarly, a switch from AEM to REM was observed the period after the passage of Sarbanes-Oxley Act (SOX); a law that strengthens firm's auditing mechanisms (Cohen et al., 2008). In the same context, Ewert and Wagenhofer (2005) find evidence that AEM was preferred prior to IFRS

implementation, while REM was preferred after IFRS adoption (Ipino & Parbonetti, 2017). Ferentinou and Anagnostopoulou (2016) investigate Greek firms before and after the adoption of IFRS and find that there is a shift from AEM to REM after IFRS. Consistently, Ho et al. (2015) document that A-share Chinese firms shifted from AEM to REM method after IFRS adoption. REM is less possible to be discernible from capital markets and thus it is favored to AEM (Bruns & Merchant, 1990; Graham et al., 2005; Kothari et al., 2016; Libby & Lindsay, 2007). However, institutional investors' scrutiny and tax effects limit REM activities (Bushee, 1998; Zang, 2012). Another reason for REM preference is that it can be implemented during the fiscal year, in contrast to AEM that can be exercised at the year-end. There's no flexible solution if the firm's reported earnings fall short of the intended target and the amount gained from AEM cannot cover it. Existing bibliography also provides evidence that both methods can be used as supplementary or as substitutes (Alhadab et al., 2015; Matsuura, 2008; Zang, 2012).

As for earnings management consequences, Cohen and Zarowin (2010) present evidence that both AEM and REM lead to weaker future performance, with stronger results occurring from engagement in REM activities. Similarly, Gunny (2005) investigates the effect of four types of REM activities on operating performance. Namely, these types are reduction in R&D and SG&A expenses, selling of fixed assets and decreasing of cost of goods sold (COGs) expenses through price reductions, lenient credit conditions or overproduction. Her findings indicate that all four types of REM are strongly related to lower return on assets (ROA) the year following the earnings management, and except for the SG&A expenses, the other types are associated with lower future cash flows.

Consistent with bibliography, CS is not to compare with AEM and REM, as CS does not affect bottom-line reported earnings, in contrast to the other methods. McVay (2006) defines CS as the reclassification of core expenses, namely COGs and selling, general and administrative (SG&A) expenses, to special items. This vertical shifting is opportunistically motivated by investors with an intent to inflate their core earnings. The level of core earnings' boost is analogous to special items' decline. Given that special items are not included in pro forma and analysts' forecast earnings, CS is used from managers in order to hit desired earnings targets. In the light of outsiders' focus on core earnings rather than in the bottom-line, as the former are more informative for future performance (Haw et al., 2011), CS is an appropriate tool to mislead the interested parties. It is supported that analysts and investors concentrate their accounting interest in pro forma earnings, as they perceive them as more indicative of the firm's performance (Bradshaw & Sloan 2002; Gu & Chen, 2004). The closeness of line items to sales is positively connected to its permanence (Fairfield et al., 1996; Lipe, 1986) and the value-significance of each line item is differently weighted from investors (Bradshaw & Sloan, 2002; Fairfield et al., 1996; Francis et al., 1996).

CS does not modify the way expenses are measured or recognized but intervenes in the way they are reported in the income statement through categorizing them at managers' discretion. Thus, with the reported net income not be affected, CS is less possible to be

subject to scrutiny from external monitors (Haw et al., 2011; McVay, 2006; Nelson et al., 2002; Nelson & Skinner, 2013). Furthermore, CS decisions are liable to managerial judgement and external auditors may not be of the ability to distinguish between proper and improper expenses' allocation in the income statement (Haw et al., 2011; McVay, 2006; Zalata & Roberts, 2016). This renders CS a relatively low-cost earnings manipulation method (Haw et al., 2011). CS does not affect future performance (Athanasakou et al., 2009) as there are neither income-increasing accruals for the fiscal year that will be reversed the subsequent year, nor suboptimal operating activities resulting in weaker future performance (Haw et al., 2011; McVay, 2006). This supports it being of low-cost relatively to other earnings management methods and thus renders it an attractive method to be adopted by managers if their intent is to manage core earnings. Additionally, in contradiction to opportunistic incentives for CS (Haw et al., 2011; McVay, 2006), it has been stated that CS has firm value-adding consequences (Lattanzio & Thomas, 2019) and contributes to efficient reporting of accounting information (Ha & Thomas, 2020). This is supported by outsiders' perception that pro forma earnings are indicative of firm value (Bradshaw & Sloan, 2002; Gu & Chen, 2004; Lipe, 1986).

In our thesis, we concentrate on AEM and REM as earnings management proxies used for our research purposes, also supported in the existing bibliography and thus, we do not extensively examine this method. Any reference to earnings manipulation that follows below is limited only to AEM and REM.

2.1.3. Incentives for Earnings Management

The existing bibliography provides a variety of motivations for earnings management behavior. Healy and Wahlen (1999) refer to capital market-related incentives, private gain purposes, and motivations to avoid contractual violations in lending agreements and regulatory intervention. Beneish (2001) separates earnings management motivations in two categories, opportunistic with an intent to mislead investors and informative to better signaling shareholders for firm's good performance. Chen and Tsai (2010) distinguish three categories of earnings management incentives. The first category is altruistic motivations that lie in firm's effort to be benefited or to face a financial difficulty. Pressure from financially affiliated partners, such as analysts and creditors, and opportunistic motivations referring to private gain constitute the second and third category, respectively. The financial condition of the firm significantly affects the engagement in earnings management practices. Such practices are positively associated with highly leveraged firms and negatively with firm's ROA (Buerter et al., 2020). For example, Anagnostopoulou and Tsekrekos (2015) document that high leveraged firms are positively associated to upwards real earnings management. In this section, we are going to present more analytically some of the earnings management incentives provided by researchers.

Fudenberg and Tirole (1995) support that managers proceed to income smoothing based on their personal benefit, consistent with Schipper (1989). Following this opportunistic

sense, Healy (1985) finds evidence that bonus awards policy motivates managers to manipulate reported earnings through accruals and accounting process decisions so as to maximize the value of their bonus. There has been found a strong relation between accruals and reported earnings incentivized by managers' bonus contracts. In particular, when there is an upper or lower barrier for bonus, then managers tend to manage earnings through accruals downwards, in contrast to the results from Gaver et al. (1995). On the opposite, when there is no limit in bonus awards, it is more possible that managers select income-increasing accruals. This is consistent with Holthausen et al. (1995) who prove that CEO tend to manipulate their earnings downwards through accruals when they receive the upper bound bonus. In the same framework of bonus incentives, Dechow and Sloan (1991) find that CEOs, being short-oriented, proceed to R&D expenses reductions during their last working year before retirement because of the benefits they enjoy. As for incoming CEOs, they manage their earnings downwards through asset write-offs or write downs the year they take on the position and upwards the next year to show they lead the company efficiently (Boone & Raman, 2007; Francis et al., 1996; Riedl, 2004; Strong & Meyer, 1987).

Bergstresser and Philippon (2006) prove through empirical evidence that CEOs or other executives are more inclined to manipulate reported earnings of their company when their compensation is affected by share prices. Specifically, they are motivated to intervene in the stock price performance, for example through aggressive option exercise or share selling. The phenomenon of adopting earnings management practices by highly motivated CEOs was originated at late 1990s. Erickson and Wang (1999) support that acquiring firms that finance the purchase through stocks are motivated to proceed to upward earnings management with an intent to increase their share price. Similarly, in share for share corporate mergers or acquisitions it has been found that acquiring firms manage their working-capital accruals upwards directly after the offer announcement, or even earlier before the determination of expansion strategy. Evidence shows that accruals are reversed (negative discretionary accruals) the year following the merge or acquisition, though not significantly when cash-flow-related accruals are used (Botsari & Meeks, 2008). Additionally, Cheng and Warfield (2005) show that stock-based compensation managers are more incentivized for earnings management through beating or just meeting analysts' forecasts. When they manage to increase the stock price through manipulation of reported earnings, they are profited by selling overvalued shares afterwards. This is characterized opportunistic because it benefits insider shareholders against the outsider ones. Graham et al. (2005) prove additionally that CFOs and CEOs intervene in real activities to manage their earnings in a way they can shape their stock price. They are short-term oriented, explained by the fact that managers want to achieve temporary rising stock prices, as they believe that this is a significant criterion for their skills assessment and their jobs' maintenance, or they pursue to sell their stock to equity analysts. Consistent with the above, Cohen et al. (2008) find evidence that managers, driven by opportunism, exercised accrual-based management motivated by the increased stock compensation during the period of SOX implementation.

Leuz et al. (2003) examine earnings management from a legal perspective. They support that enforced investor protection laws deter insiders from earnings management practices. Thus, insiders' incentives to conceal reported earnings induced by private control benefits are negatively linked to the level of legal systems' strength regarding investors protection. Similarly, according to Burgstahler et al. (2006), earnings manipulation is presented more often in countries with weaker legal enforcement, both in public and private firms. The authors find also that private firms in European countries are more prone to earnings manipulation than public firms, in the sense that capital markets encourage a more informative earnings reporting, and the stronger ones reinforce investors' protection.

Graham et al. (2005) support that earnings management is exercised according to insiders' perception of how outsiders and shareholders respond to company's reported information. Referring to such responses, the stock market abhors companies not meeting earnings target and puts in an unfavorable position the ones not reaching their goals. If a company misses hitting a benchmark, it is considered to have a bad effect on its future growth. What is more, not presenting smooth earnings dissatisfies outsiders due to the risk of incidental to the earnings volatility, whereas reporting market related information reduces lower information risk. Additionally, some of the reasons managers manipulate their earnings in order to meet earnings goals lie in bond covenants, employee bonus awards and share price incentives (Dechow & Skinner, 2000; Fields et al., 2001). Referring to income smoothing, DeFond and Park (1997) prove that managers use income-increasing accruals to boost bad firm performance when there's a perspective for good performance in the future. Conversely, they use income decreasing accruals when current performance is higher to what is anticipated for the future. Managers proceed to such practices for job maintenance purposes.

Burgstahler and Dichev (1997), based on empirical evidence, support that managers intervene in reported earnings through cash flows from operations and changes in working capital in order to avoid earnings decreases and losses. The authors present two explanations as incentives for earnings management. The first is the reduction in cost transactions with stakeholders, consistent with Barth et al. (1999), and the second is prospect theory which refers to the loss aversion of investors, introduced by Kahneman and Tversky (1979). Similarly, Degeorge et al. (1999) present evidence that managers manipulate their earnings in order to have positive income, maintain the last years' performance, and hit the analysts' targets; the incentives are hierarchically referred. When profits are below these thresholds, then income increasing methods are exercised. Roychowdhury (2006) adds that managers adjust their operational activities for their earnings not to fall behind analysts' forecasts. She finds this in companies with small positive earnings or forecast errors. Furthermore, earnings management practices are more pronounced when they permit managers reach the desired thresholds reflecting analysts' forecasts (Dechow & Skinner, 2000). The significance of meeting or beating analysts' forecasts is underlined by Bartov et al. (2002). The authors find on a quarterly basis that firms succeeding to reach these targets perform better the following quarter relatively to firms failing to do so.

Teoh et al. (1998 a) and Teoh et al. (1998 b) document that firms use income-increasing discretionary accruals before going public through Initial Public Offering (IPO) and before issuing new equity through Seasoned Equity Offering (SEO), respectively. The authors record that firms engaging in such manipulation, experience a long-term underperformance the years following the offering. Teoh et al. (1998 c) and Friedlan (1994) find results consistent with Teoh et al. (1998 a). Cohen and Zarowin (2010) present evidence that managers use both abnormal accruals and real activities manipulation around SEOs and show that the following underperformance is worse when using the latter method. Kothari et al. (2016) support that managers overstate firms' earnings at the time of a SEO, mainly using real activities, namely unusual reduction in R&D or SG&A. The authors propose that managers firstly exhaust their ability to engage in AEM and then shift to REM, consistent with Badertscher (2011). Othman and Zeghal (2006) find evidence that Canadian firms, as mainly financed by capital markets, are motivated to exercise earnings management prior initial or subsequent public offerings. More recently, Alhadab et al. (2016) find evidence that firms make use of accruals and real activities to manipulate their earnings the year of the IPO. This is more pronounced in looser regulation systems. On the contrary, Aharony et al. (1993) reach only weak findings that executives manage their earnings upwards the period before the IPO. Such kind of earnings management that is detected, is mainly found in small firms and firms with high debt levels and is dependent upon underwriters' and auditors' quality. Similarly, Ball and Shivakumar (2008) support that managers enhance the quality of their financial reporting, consistent with Ball and Shivakumar (2005) rather than manipulate their earnings in an opportunistic manner.

Further, the literature refers to tax-related incentives for earnings management. Lin et al. (2012) provide evidence from Chinese firms, which reported negative discretionary current accruals in 2007. Motivation behind this is that in 2008 the NEIT law was implemented which reduced corporate tax rate from 33 to 25 percent. By managing their earnings downwards, executives were benefited from transferring their taxable income to a lower-tax period. However, firms mainly state-owned, firms with audit committee being part of the Board and firms that publish their internal auditing practices are less motivated to proceed to such manipulating activities. Phillips et al. (2003) find evidence that deferred tax expense contributes to the accrual metrics used for the detection of earnings management with an intent to avoid an earnings decrease or a loss. Managers use income-increasing discretionary accruals under GAAP in a way that does not affect their income tax payable. This induces current book-tax differences and thus increases the deferred tax expenses. So, book and tax reporting are connected to earnings manipulation behavior. Moreover, Dhaliwal et al. (2004) support that managers use income tax expenses to meet analysts' forecasts. When their earnings are below analysts' target, they lower the effective tax rate as a last resort to hit the target. Earnings manipulation through tax expense is more pronounced in firms with higher accruals. Othman and Zeghal (2006), investigating for earnings management incentives among Canadian and French firms, present evidence that the French ones, as mainly financed by bank loans, are incentivized by the costs connected to debt contracts and the effective tax rate. This can be explained

by the connection of accounting earnings to fiscal rules and the bank loans that constitute the French firms' main financing method.

Debt-covenant restrictions lie in firms' obligation to meet specific targets in their accounting reporting such as a threshold in the earnings to the total debt ratio, as defined in the agreed-upon contract with the lenders. DeFond and Jiambalvo (1994) investigate firms that have violated debt covenants and find evidence of significant income increasing earnings management using abnormal and working capital accruals the year before the violation. Sweeney (1994) also examines firms that fell short of debt restrictions but presents evidence that these exercise upwards earnings management the period after the violation. The accounting response to the violation is dependent upon the penalty-costs imposed from the lenders and the availability of managers to intervene in accounting reporting. Jha (2013) provides evidence that the period before and during the debt-covenant violation occurrence, managers manage their earnings upward and downward, respectively. Moreover, earnings manipulation has been found to help managers reach a better compromise with the lenders after the debt-covenant violation. However, SOX deters managers from accrual-based earnings manipulation behavior in order to avoid a violation.

More on contractual incentives, Ater and Hansen (2020) prove that managers intervene upwards in their reported earnings through discretionary accruals prior to private debt issuance. Their intent is to meet better lending conditions based on better firm performance. The authors find that this is more pronounced in high-constraint firms and firms already exercising income-increasing earnings management for a long-run. Daniel et al. (2008) present indirect evidence that dividend constraints, namely when earnings are not sufficient for dividend payments, are connected to upward earnings management practices. However, this is not widely supported in bibliography (DeAngelo et al., 1994; Healy & Palepu, 1990; Kim et al., 2017). It has been found that in case of dividend restrictions, managers select to cut dividends rather than manipulate their earnings.

Among other incentives for earnings manipulation, there is conformity with regulations such as meeting the capital adequacy requirements (Healy & Wahlen, 1999). Credit rating status constitutes also one of them. It has been found that BBB and BB manufacturing firms use REM more extensively related to firms with different ratings. This is more pronounced in manufacturing firms with credit ratings close to the desired or analysts' proposed rating level (Brown et al., 2015).

2.1.4. Measurement of Accrual-Based Earnings Management

According to past research, existing models estimate the discretionary accruals regarded as proxy for accrual-based earnings management. The models begin with the calculation of total accruals and the decomposition of them in the nondiscretionary normal component that is explained in the estimated regression and the discretionary or unexpected component that is not explained in the model, calculated as the residuals of

the regression (Dechow et al., 1995; Healy & Wahlen, 1999). We present below six models widely examined and used in the accrual-based earnings management literature.

The Healy Model (Healy, 1985)

Healy (1985) calculates total accruals as the reported accounting earnings minus the cash flows from operations. The latter are defined as working capital from operations minus changes in inventory and receivables plus changes in payables and income taxes payable. He considers that earnings management occur in every period. He separates the sample in three categories regarding predicted direction of earnings management. The first category includes earnings with upwards management forecast and the other two with downwards management forecast. Then, he compares each group with the mean of total accruals scaled by lagged total assets. The group with firms predicted for upwards earnings management interprets the estimation period and the other two groups the event period, namely when management is exercised. Thus, the mean total accruals from the estimation period are the proxy for nondiscretionary accruals. As explained in the following model:

$$NDA_{\tau} = \frac{\sum TA_t}{T} \quad (1)$$

, where:

- NDA = Estimated non-discretionary accruals
- TA = Total accruals divided by previous period's total assets
- t = Subscript for year 1, 2, ... T
- τ = Subscript for year in the event period

The DeAngelo Model (DeAngelo, 1986)

The DeAngelo Model is considered to be a subcategory of Healy Model (Healy, 1985), in which the estimation period used to calculate nondiscretionary accruals lies only previous year's observations. Total accruals are used to calculate nondiscretionary accruals as in Healy's model. DeAngelo (1986) proposes that change in total accruals is expected to be of zero value in the absence of earnings management. Nondiscretionary accruals are calculated as previous period's total accruals scaled by lagged total assets as follows:

$$NDA_{\tau} = \frac{TA_{t-1}}{T} \quad (2)$$

If nondiscretionary accruals remain unchanged over time and discretionary accruals have zero mean value in the estimation period, then there's no error in nondiscretionary accruals for both models. If there are changes in nondiscretionary accruals, then the latter are measured with errors in both models. Healy's model is appropriate if nondiscretionary accruals follow white noise around a constant mean, whereas DeAngelo's model is preferred if nondiscretionary accruals follow a random walk. However, Kaplan

(1985) indicates that nondiscretionary accruals change in relation to economic conditions, rather than remain constant. Weakness to reflect the impact economic circumstances on nondiscretionary accruals leads to estimation biases.

The Jones Model (Jones, 1991)

Jones (1991) considers nondiscretionary accruals as nonconstant in his model. He attempts to capture the effects of economic conditions' changes in nondiscretionary accruals and models the latter as follows:

$$NDA_{it} = \alpha_1 \frac{1}{A_{it-1}} + \beta_{1t} \Delta REV_{it} + \beta_{2t} PPE_{it} \quad (3)$$

, where:

- NDA_{it} = Nondiscretionary accruals in year t for firm i
- A_{it-1} = Total assets at year $t-1$ for firm i
- ΔREV_{it} = Change in revenues in year t for firm i scaled by lagged total assets
- PPE_{it} = Gross property, plant and equipment in year t for firm i scaled by lagged total assets
- t = Subscript for year in the event period
- i = Subscript for firm parameter

Thus, he models total accruals, as considering their decomposition in the observed nondiscretionary accruals and the unobserved discretionary accruals, as:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \beta_{1t} \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + \beta_{2t} \frac{PPE_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (4)$$

, where e_{it} stands for the error term in t year and i firm. The residuals from the cross-sectional ordinary least squares (OLS) regression of the above model, represent the discretionary accruals, as the unexplained part of total accruals. Around one quarter of the variation in total accruals is strongly explained by Jones model. However, the bias in Jones models is that revenues are considered as nondiscretionary. So, if revenues are to be managed, they will be depicted in normal accruals, rather in discretionary accruals as they should. Thus, discretionary accruals do not capture this managerial discretion (Dechow et al., 1995).

The Modified Jones Model (Dechow et al., 1995)

Dechow et al. (1995) augment Jones model (Jones, 1991) in an effort to eliminate the above-mentioned bias in Jones model regarding earnings management through earnings. Particularly, they subtract the change in net receivables from change in revenues for every firm-year observation. The model is expressed as follows:

$$NDA_{it} = a_1 \frac{1}{A_{it-1}} + \beta_{1i} \Delta(REV_{it} - REC_{it}) + \beta_{2i} PPE_{it} \quad (5)$$

, where REC_{it} represents net receivables in year t for firm i .

Dechow et al. (1995) imply change in credit sales stem from engagement in earnings management activities, whereas Jones (1991) assumes that revenues are not subject to manipulation. They elaborate on this, as it is easier for managers to manipulate earnings through recognition of revenues from credit sales than from cash sales.

The ROA-adjusted Jones Model (Kothari et al., 2005)

Kothari et al. (2005) augment Jones model (Jones, 1991) with ROA in the current or the previous period as follows:

$$NDA_{it} = a_0 + a_1 \frac{1}{A_{it-1}} + a_2 \Delta REV_{it} + a_3 PPE_{it} + a_4 ROA_{it \text{ or } it-1} \quad (6)$$

, where ROA_{it} stands for the return on assets in year t for firm i .

They are motivated by the fact that discretionary accruals are significantly affected by firm's current and past performance (Dechow et al., 1995), so it is important that the model estimating discretionary accruals capture for the impact of performance. ROA as a measurement of performance is justified on the basis of ROA's definition earnings scaled by assets (as all variables in Jones model are scaled by assets) and of previous research which shows that unusual stock return performance and operating performance are better detected when matched with ROA rather than other variables (Barber & Lyon, 1996, 1997; Lyon et al., 1999). Generally, there is evidence that accruals are associated with firm's current or past performance (Barth et al., 2001; Dechow et al., 1995, 1998; Guay et al., 1996).

Measurement of Accounting Quality via the estimation of the quality of accruals (Dechow & Dichev, 2002)

Dechow and Dichev (2002) propose that accruals' adjustment relative to the recognition of cash flows over time contributes to better measurement of firm performance. If there is an estimation error in recorded accruals, then the quality of accruals and earnings is lowered to the extent of the estimation error. The authors use the efficiency of working capital accruals to capture cash flow realizations as proxy for accruals and earnings quality, arguing that working capital accruals fully reflecting cash flows represent high accounting quality, also supported by Palepu (2000). They do not distinguish between unintentional and deliberate (as from engagement in accrual-based earnings management) estimation errors, as both lead to low accounting quality. Even if earnings management is not existent, accrual quality is not to guarantee as high, as it depends on firm and industry characteristics. These characteristics is easier to be discernible than factors that

affect opportunistic earnings management. For example, there is a systematic correlation between volatile operating activities and estimation errors.

The authors construct their model on the basis that the accruals' benefit lies in the elimination of the gap between the timing of cash flows and the timing of their recognition. However, using accruals also includes estimation errors. The model examines the origination and reversal of working capital accruals which occurs during a year. They interpret change in normal working capital accruals ($N\Delta W_{it}$) as a linear function of previous year, present year and next year cash flows from operations, ($CFO_{i,t-1}$, $CFO_{i,t}$ and $CFO_{i,t+1}$ respectively) for year t and firm i . The model is expressed as:

$$N\Delta W_{it} = a_0 + a_1CFO_{i,t-1} + a_2CFO_{i,t} + a_3CFO_{i,t+1} \quad (7)$$

The accrual estimation errors, and their reversal are the residuals from regressing the above equation for each firm-year observation. The authors find evidence that the accrual quality is negatively related to the magnitude (in absolute values) of estimation errors. Thus, a greater unexplained component of their model signifies poor accrual quality. McNichols (2002) augments the model suggested by Dechow and Dichev (2002) by including change in sales and PP&E as explanatory variables for change in normal working capital accruals, in order to eliminate estimation errors and enhance its explanatory power.

2.1.5. Measurement of Real Earnings Management

In this section we present the basic models from existing bibliography that are of the ability to detect and measure REM as empirical evidence suggests. Particularly, we document how particular operating activities (sales manipulation, overproduction, discretionary expenses) as well as investment decisions (R&D expenses and sales of fixed assets) can be interpreted and thus calculated so that they signal for REM.

Fixed Assets Selling

Bartov (1993) examines whether managers manipulate their earnings through the timing recognition of long-lived assets and investment sales. The two hypotheses tested are that earnings from asset sales are negatively associated with earnings changes (earnings-smoothness hypothesis) and positively associated with debt equity ratios (debt equity hypothesis). Firstly, the hypotheses are tested separately under univariate tests. For the earnings-smoothness hypothesis, Bartov (1993) distinguishes the sample between positive ($\delta EPS_i > 0$) and negative ($\delta EPS_i < 0$) income before asset sales in the event year. For the debt equity hypothesis, he separates the sample into high and low leveraged firms according to its median debt-equity ratio. Then he tests both testes in a multiple regression under the model:

$$ASSIN_i = a_0 + a_1\delta EPS_i + a_2DETEQ_i + e_i \quad (8)$$

, where the dependent variable ASSIN stands for the income from asset sales scaled by stock price for firm, the independent variable EPS is the change in pre-tax annual earnings per share stemming from asset sales divided by share price at the beginning of the year and the independent variable DETEQ is the ratio of book-value of long-term debt to the book value of owners' equity at the beginning of the year. Subscript i represents the firm-year observation. ASSIN variable is multiplied by negative one, so that there is a monotonic relation with EPS.

Herrmann et al. (2003) examine Japanese managers' engagement in earnings manipulation through income from fixed asset sales and marketable securities. They hypothesize that positive (negative) values of income from asset sales are found in firms with negative (positive) current performance.

For their research purposes they construct the following model:

$$EISA_t = a_0 + a_1CP_t + a_2FP_t + a_3DE_t + a_4SIZE_t + a_5GROWTH_t + a_6Lag(EISA)_t + e_t \quad (9)$$

, where:

- ISA = Income from fixed assets and marketable securities scaled by lagged total assets
- $EISA$ = ISA minus median of ISA, as excess income from the sale of assets
- CP = The difference between current period's operating income, and last periods' forecasts of current period's operating income, scaled lagged total assets. This variable interprets current performance
- FP = The difference between future expected operating income and current period's operating income, scaled lagged total assets. This variable interprets current performance.
- DE = Long-term liabilities scaled by the aggregation of total shareholder' equity and long-term liabilities
- $SIZE$ = Lagged total assets of current period
- $GROWTH$ = Percentage change in sales of current period
- i = Subscript for firm parameter

More recently, Gunny (2010) presents another model for earnings management through assets sales, on the basis of Bartov (1993) and Herrmann et al. (2003):

$$\frac{GainA_{it}}{A_{i,t-1}} = a_0 + a_1 \frac{1}{A_{i,t-1}} + \beta_1 MV_{i,t} + \beta_2 Q_{i,t} + \beta_3 \frac{INT_{i,t}}{A_{i,t-1}} + \beta_4 \frac{ASales_{i,t}}{A_{i,t-1}} + \beta_5 \frac{ISales_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (10)$$

, where:

- $GainA$ = Income from asset sales multiplied by negative 1

A	=	Total assets
MV	=	Natural logarithm of market value
Q	=	Tobin's Q
INT	=	Internal funds
$ASales$	=	long-lived assets sales
$ISales$	=	long-lived investment sales

Internal funds are used as a proxy to control for reduced funds spendable for investment and Tobin's Q represents the incremental benefit to marginal cost of a new investment unit.

Sales manipulation

Roychowdhury (2006) defines sales manipulation as the deliberate acceleration or inconsistent boost of sales. This can be achieved through temporary price reductions in order to shift next years' sales into the current year. Another possible way to temporarily increase sales is by offering more lenient credit terms. Sales management results in lower cash-flows in the current period as sales at discount lead to lower cash-inflow. The author interprets "normal" cash flow from operations as proposed by Dechow et al. (1998) and particularly as a function of sales and sales growth (their difference from current and previous period sales) for every firm-year observation in the current period. Abnormal CFOs are the unexplained component of the model suggested, namely the difference between actual and normal CFOs.

Overproduction

Managers of manufacturing firms proceed to more production than needed in order to overstate their earnings, with an intent to hit expected or desired targets (Roychowdhury, 2006). Overproduction leads to lower fixed costs per unit as the overall fixed cost is allocated in more units. With other marginal costs remaining constant, total cost per unit decreases and thus operating profit increases. On the contrary, with the overproduction not being channeled through sales in the same period, it leads to additional inventories costs and thus to annually higher levels of production costs relatively to sales. This results in lower cash flows from operations than the level of recognized sales proposes. Roychowdhury (2006) defines "normal" production costs as the aggregate of COGs and change of inventory in the current period, as per Dechow et al. (1998). COGs are expressed as a linear function of current sales, whereas change in inventory as a linear function of current sales, current sales growth and sales growth in the previous period. Thus, abnormal production costs are the residuals stemming from the estimation of the model. Gunny (2010) follows Roychowdhury (2006) and augments the production costs' model by adding the explanatory variables of Tobin's Q and the natural logarithm of market value.

Discretionary expenditures

According to Roychowdhury (2006) firms can manage their earnings upwards by deferring discretionary expenditures, such as R&D, advertising, and maintenance. As discretionary expenditures are spent the same period that they are recognized, a reduction in them leads in lower reported expenses. This is more pronounced in such expenses that do not produce direct revenues or earnings. Thus, earnings manipulation to boost earnings and reach desired requirements is attained through unusually low discretionary expenditures. Roychowdhury (2006) defines discretionary expenses as the aggregate of R&D, advertising and SG&A expenses. He models “normal” discretionary expenses as a linear function of previous period’s sales, whereas the model proposed by Dechow et al. (1998) contains sales of the current period. Roychowdhury (2006) elaborates on this deviation by arguing that when income-increasing sales manipulation is exercised in any year, then as the above-mentioned model suggests, abnormally low discretionary expenses occur even when they have not been managed.

Gunny (2010) examines R&D and SG&A separately as proxies for real earnings management and propose their own model. They interpret R&D expenses as a linear function of lagged R&D; that signal for firm’s R&D opportunity, internal funds; that represent the decreased funds available for investments, Tobin’s Q; that serves for the incremental benefit over the marginal cost of a new investment, the natural logarithm of market value of equity; as control for size. As for SG&A expenses, they interpret them as a linear function of internal funds; that represent the decreased funds available for investments, Tobin’s Q; that serves for the incremental benefit over the marginal cost of a new investment, the natural logarithm of market value of equity; as control for size, sales growth and sales growth times a dummy variable that take value 1 if sales growth is negative, 0 otherwise. As for the last explanatory variable they adopt the cost stickiness behavior (Anderson et al.,2003). This behavior supports that costs are greater in sales increase relative to the level of cost reduction in sales decrease.

It should be mentioned that the approach of Roychowdhury (2006) including abnormal production, sales manipulation and discretionary expenditures is widely used in REM literature (Cho & Chun, 2016; Cohen et al., 2008; Cohen & Zarowin, 2010; Ferentinou & Anagnostopoulou, 2016).

2.2. Corporate Sustainability Performance

2.2.1. Definition

Sustainable development refers to the development that satisfies present generations’ needs and ambitions in way that resources needed for future generations are preserved. This implies meeting the needs of poor’s globally, through more fair allocation of chances and resources, and subduing growth and resource depletion in order for the environment to be protected for future needs. (WCED, 1987). As Jadoon et al. (2021) states, sustainable development supports the economic and social development in respect to the

environment and proper utilization of natural resources. Sustainable development is of global concern considering that the United Nations set 17 Sustainable Development Goals (SDGs) in 2015, aiming to end poverty and hunger, protect the planet and ensure prosperity for all by 2030 (UN, 2015).

Regarding corporate sustainability, there is no consensus reaching for its definition (Cancela et al., 2020; Hummel & Ising, 2015). Elkington (1997) proposes that companies should focus on profit, people and planet when evaluating their sustainability goals. However, the predominant definition for corporate sustainability performance is linked to the Triple Bottom Line (TBL) approach referring to the economic prosperity combined with social and environmental responsibility (Budsaratragoon & Jitmaneeroj, 2019; Yu & Zhao, 2015). This approach suggests that corporate sustainability refers to the equal incorporation of economic, social and environmental concerns in business operations when it comes to making decisions (Pope et al., 2004; Tatham et al., 2014). Hummel & Ising (2015) propose that corporate sustainability performance (CSP hereafter) is a multidimensional construct, that entails the economic, social and environmental dimensions of a company.

It has been observed that corporate managers do not discriminate between CSR and CSP and connect them with the adoption of social and environmental awareness in business practices as well as the interaction with the stakeholders (Montiel, 2008). Hummel and Ising (2015) also consider CSR and CSP as close equivalents. In line with the above, it is significant to define CSR. Wood (1991) refers to it as a: *“a business organization’s configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm’s societal relationships”*. Similarly, Carroll (1979) proposed that CSR includes the economic, legal, ethical and at the managers’ discretion obligations that a firm has to serve for society. CSR lies in sacrificing a part of earnings in order to serve societal issues (Benabou & Tirole, 2010). European Commission (2011) states that firms are socially responsible by incorporating social, environmental, ethical, consumer, and human rights concerns in their business practices and conforming with the law. According to the above definitions, CSR-oriented firms should aim at making profit by simultaneously being law-abiding and good corporate citizens (Gao & Zhang, 2015). Furthermore, CSR approach represents a multi-stakeholder approach, as it promotes firms’ deviation from the target to maximize shareholders’ value, in order for the common social prosperity to be achieved (Goss & Roberts, 2011). As such, adopting CSR practices implies management’s transparency and accountability to interested parties (Bozzolan et al., 2015).

It should be clarified that corporate governance is a distinct construct from CSR, and thus from CSP (Kim et al., 2012) and its impact on financial reporting has been extensively examined (Bergstresser & Philippon, 2006; Klein, 2002). Corporate governance lies in the set of mechanisms that affect managers’ decisions when firm ownership and control are separated (Larcker et al., 2007). Good corporate governance assures that the firm operates in favor of shareholders’ interests. Depending on the definition of shareholders’ interests, given that CSR lies in activities that serve societal

and environmental issues as well as all stakeholders' interests, CSR and corporate governance may or may not be completely distinct constructs. CSR incentives also affect their relation. If CSR practices are adopted for managers' private benefit, then corporate governance acts as a disciplinary measure, implying that CSR and corporate governance are negatively linked. (Kim et al., 2012; Larcker et al., 2007). Additionally, it is assumed that corporate governance significantly affects long-term firm performance (Evans et al., 2006) as well as financial disclosure (Cheng & Courtenay, 2006). The examination of both environmental-social performance and corporate governance performance is known as ESG performance. Gerard (2019) explains that the difference between ESG and CSP is that CSR is focused on the first two dimensions of ESG, the environmental and social pillar. Jadoon et al. (2021) support that social-environmental dimension focus on basic operational business strategies, whereas corporate governance dimension lies in directing and reporting these activities.

2.2.2. The impact of Corporate Sustainability Performance on firm performance

In the last 30 years it has been observed an increasing trend from firms to incorporate CSR aspects in their strategic decisions (Eccles et al., 2014; Ioannou & Serafeim, 2015). An ever-increasing number of firms issues sustainability reports, mainly following the GRI standards, in order to publicize their sustainability performance to stakeholders (Rezaee, 2016). Especially, after the global financial crisis, stakeholders' involvement is more intense, mostly in large and international companies. This has resulted in an increase in non-financial reporting and has raised the attention for CSP (Velte, 2019). CSP plays a major role in financial markets (Murphy & McGrath, 2013), and the investors' growing sensitivity to such issues leads them to Social Responsible Investing (SRI) strategies (Qiu et al., 2016). At this point, it is useful to examine the impact of CSP on financial performance.

The relationship between CSP and financial performance has been widely examined the last years (Griffin & Mahon, 1997; Xu et al., 2019). Some studies show that CSP is unnecessarily costly for managers without increasing firm value (Friedman, 1970; Jensen, 2001). Friedman (1970) supports that "social responsibility" eliminates company's proceeds at the expense of shareholders and mainly serves window-dressing purposes. For example, it can be used to justify a wage reduction. Campbell (2007) states that CSR behavior is more pronounced in strong firms, healthy economy conditions and social-conscience-oriented regulations. As for competition, there is U-shape relation with CSR. Social responsibility is implemented when the levels of competition are moderate, rather than low or high. On the contrary, as Unruh et al. (2016) state, a 2016 survey from MIT Sloan Management Review shows that 60% of surveyed investors convey sustainability performance with lower firm risk and cost of capital and do not invest in companies with weak CSP. Furthermore, Clarkson et al. (2013) prove that voluntary environmental disclosures enhance firm value through communicating the preemptive environmental strategies to investors.

Existing literature provides two contradicting perspectives regarding the value relevance of CSP for a firm, namely the social impact hypothesis and the trade-off hypothesis (Chen & Lee, 2017; Jadoon et al., 2021). The social impact hypothesis (Chen & Lee, 2017; Fischer & Sawczyn, 2013) proposes that CSR activities have a positive impact on firm performance, based on stakeholder theory. Satisfying stakeholders' expectations regarding sustainability leads to reduced financial risk, enhanced reputation, and higher amount of investment, all of which increase firm-value and earnings. In contrast, the trade-off hypothesis, based on agency theory, assumes that the incorporation of CSR practices from a firm, sacrifices valuable financial resources at the expense of shareholders (Chen & Lee, 2017). Shareholders perceive sustainable activities as value decreasing, and thus negatively connected to firm performance (Chen & Lee, 2017; Donaldson & Preston, 1995).

However, it has been stated that there is a bind between shareholder (agency) and stakeholder theory. As Jones (1995) suggests, when relation between the contracting parties and the company is based on cooperation, ethics and trust, then both sides are benefited. Porter and Kramer (2006) assert that CSR constitutes an opportunity for firm growth, rather than a firm cost or restriction.

2.2.3. The relation between Corporate Sustainability Performance and Earnings Management

The existing research that examines the impact of CSP on earnings management is extensive and exhibits mixed and opposing results (Velayutham, 2018; Velte, 2020).

There are many empirical studies indicating that CSR is negatively associated with earnings management, consistent with stakeholder theory. Hong and Andersen (2011) show through accruals quality that CSR-oriented U.S. firms present higher earnings quality. Similarly, Kim and Venkatachalam (2011) provide evidence through accruals quality of sin firms, namely the firms from gaming, tobacco, alcohol and adult entertainment industries. They find that sin firms present accruals better predicting future accruals and more timely recognizing losses, compared to a control group of non-sin firms. They attribute sin firms' earnings quality to their adopting more socially responsible activities. Kim et al. (2012) prove that it is less possible for socially responsible U.S. firms to proceed to earnings management, measured by discretionary accruals, proxies for real activities manipulation and releases from Accounting and Auditing Enforcement (AAER). Scholtens and Kang (2013) show that Asian firms with relatively good socially responsible performance proceed less to earnings manipulation. There is also evidence that greater CSR engagement enhances the quality of financial reporting towards mitigating earnings smoothing as well as loss and decrease avoidance (Chih et al., 2008).

Chouaibi and Zouari (2021) examine listed firms five European countries and find a significant and negative effect of CSR practices on REM. Gras-Gil et al. (2016) find a

negative impact of corporate social responsibility practices on accrual-based earnings management for Spanish firms. Similar findings have also been proven for the Korean Market (Cho & Chun, 2016; Choi & Pae, 2011). Choi and Pae (2011) find evidence from Korea that firms with higher ethics commitment, are less pronounced in earnings management, are based on conservative accounting, and are found to have better predicting cashflows. Similarly, more CSR-active Chinese firms, even if obliged to act responsibly, are more pronounced in accounting conservatism and thus present better earnings quality (Cheng & Kung, 2016).

Bozzolan et al. (2015) finds evidence from an international sample of firms that CSR-oriented firms do not proceed to REM, as they consider its value-decreasing effects in future performance. This way they create value for all stakeholders. Research also shows that better CSR performance is connected to decrease analyst and management forecast error (Dhaliwal et al., 2012; Lee, 2017). Litt et al. (2013) show that firms incorporating more environmental consciousness, such as through preventing pollution, exhibit lower AEM. There is also evidence from international sample of firms that CSR performance is negatively linked to AEM (Martínez-Ferrero et al., 2015 a; Martínez-Ferrero et al., 2015 b).

However, there is also research indicating a positive relationship between CSR and earnings management, consistent with agency theory. CSR is found to be used as a tool to conceal AEM (Prior et al., 2008). Salewski and Zülch (2012) examine European bluechips and present evidence that firms more active in CSR activities are positively linked to more AEM. Buertey et al. (2020) show that South-African public firms usually adopting CSR practices, are more pronounced in earnings management behavior, consistent with Jordaan et al. (2018). Mohamed et al. (2020) find that Egyptian firms with weaker performance use CSR to “greenwash” their earnings. Martínez-Ferrero et al. (2016) examine an international sample of firms and find evidence that CSR is used as tool to shift the negative effects of earnings management practices to cost of capital. This is more pronounced in countries with weaker investor protection legislation. Similarly, Muttakin et al. (2015) show that issuing more CSR disclosures is positively linked to upwards AEM and this is more pronounced in emerging economies. On the contrary, they find that export-oriented firms that publicize more CSR activities are more transparent in their financial reporting and do not exercise earnings management, due to the scrutiny of powerful stakeholders. Gargouri et al. (2010) present evidence that Canadian firms more responsible in environmental and employees issues, have a positive relationship with earnings management. Moreover, Muttakin and Subramaniam (2015) prove that CSR commitment is connected to poorer earnings quality regarding Indian firms.

2.3. Hypothesis development

The first perspective suggests that CSP is negatively associated with earnings management on the basis of stakeholder theory and stewardship theory. According to the

stakeholder theory (Carroll, 1979; Freeman, 1984), satisfying the heterogeneous needs of stakeholders is beneficial and can lead to a sustainable financial performance of the firm. Similarly, being responsible for a wide group of stakeholders creates firm value and improves financial performance (Harrison & Wicks, 2013). This results in mitigation of information asymmetries and opposing goals between the contracting parties (Freeman, 1984). The theory assumes that firms should act responsibly for investors and creditors as well as for stakeholders with non-financial association. Engaging in CSP activities that serve social and environmental issues can meet stakeholders' expectations. As such, satisfied stakeholders support the firms in a long-term basis, and thus secure firms' continuity (Martínez-Ferrero et al., 2016). This implies that stakeholder theory is against managerial opportunism and thus against earnings misstatement. As Kim et al. (2012) state, it is unethical and against corporate citizenship to integrate CSR practices in order to disguise their earnings distortion activities. Such improper business activities can also harm the relationship between firm with its stakeholders. As for stewardship theory (Davis et al., 1997), it proposes that managers are responsible stewards of the assets they administrate. They act for the common good rather than opportunistically for their private benefit. They are characterized as socialists, pro-organizational and reliable. So, their management practices are ethical, social responsibility driven and oriented in promoting CSR (Davis et al., 1997). In line of the above, managers that adopt CSR practices lead the company with transparency and accountability to stakeholders and provide valid financial reporting and non-financial reporting (Velayutham, 2018; Velte, 2017, 2019). Thus, they do not exercise earnings management. Following this reasoning we assume our first hypothesis as:

H1: There is a negative relationship between Corporate Sustainability Performance and earnings management.

The second perspective suggests that CSP has a positive impact on earnings management practices on the basis of agency theory (Jensen & Meckling, 1976; Ross, 1973). According to the theory, managers engage in CSR in an opportunistic manner, for their private benefit (Dhaliwal et al., 2011). Agency theory proposes that deceitful firms mislead their shareholders about the actual financial performance, leading to agency problems among them (Labelle et al., 2010). Earnings management behavior also causes or deteriorates agency costs and harms shareholders (Davidson et al., 2004). Managers face serious threat if such improper business practices are detected by externals. If they are more active in CSR issues in order to cover up their misconduct, they lose their reliability in financial markets (Prior et al., 2008). Additionally, there is evidence that firms integrating CSR actions only for window-dressing purposes, present a lower market value than firms non misstating their earnings (Hawn & Ioannou, 2016). Thus, managers are incited to boost their short-term performance (Dechow et al., 1996; Prior et al., 2008; Salewski & Zülch, 2012). In order mask their earnings distortion, firms are engaged in CSP activities (Hemingway & Maclagan, 2004), so that they mislead stakeholders about their transparency (Davis et al., 1997). This conceiving behavior is more pronounced when a company serves multiple objectives (Chih et al., 2008; Gargouri et al., 2010), stemming from the responsibility to meet many and heterogeneous needs of stakeholders,

as sustainable development proposes. In light of multiple objectives, there must be a tradeoff between the objectives, which need to be met simultaneously (Jensen, 2001, 2002). In this sense, where multiple stakeholders are involved, the manager obtains additional leeway to exercise earnings management for their private benefit, harming stakeholders and the firm (Hummel & Ising, 2015). Furthermore, it is assumed that additional cost induced by sustainability performance practises, incentives managers to distort their earnings (Gargouri et al., 2010). The above-mentioned arguments attribute the positive relation of CSP with earnings management to managerial opportunism. This leads us to the second hypothesis:

H2: There is a positive relationship between Corporate Sustainability Performance and earnings management.

3. Sample Selection and Research Methodology

3.1. Sample Selection

For our research purpose, which is to detect the relationship between ESG Performance and earnings management, we used the Database by Refinitiv Datastream (Thomson Reuters until October 2018). Datastream is an industry-leader in providing inclusive historical financial time series data (Refinitiv, 2020) and has been widely used with in previous research (e.g., Anagnostopoulou, 2017; Dhaliwal et al., 2012; Ferentinou & Anagnostopoulou, 2016). We retrieved annual time-series data from Worldscope for the period 2005-2020 regarding listed companies from the 19 countries of the Eurozone. The countries are presented in Appendix A. In our data selection, we filtered for category “equities”, type “equity”, and the euro currency. We also, in line with previous research (Kim et al., 2012; Peasnell et al., 2005; Velte, 2019) excluded the following sectors :

- Banks
- Financial Services
- Life Insurance
- Nonlife Insurance
- Real Estate Investment and Services
- Real Estate Investment Trusts

as due to their business and financial nature (Fama & French, 1992). Moreover, these sectors comply with different regulations (Barth et al., 2004) and follow different accounting methods or practices (Buerthey et al., 2020).

The initial sample consisted of 9,628 firms, from which we deducted double firm observations and companies with no available data. From the 4,034 companies left, we kept 3,233, each one of them following IFRS for at least one year. It must be noted that in the European Union, IFRS adoption became mandatory in 2005 for publicly listed companies that publish consolidated financial statements based on *Regulation (EC) No 1606/2002* (European Commission, 2022).

In the next step, we matched our sample firms with their industry classification code based on 4-digit SIC Code 1 (see Appendix B for explanation). We got rid of the companies with no available SIC Code (2 companies) as well as of those with SIC Code from categories 60-67¹ (133 companies), which refer to the finance and real estate sector. We then transformed the sic codes of our sample companies into the Fama-French 48 industry classification codes (Fama & French, 1997) using the Stata software in order to limit the range of industries. As there was no corresponding Fama-French 48 code for 8 companies, those were subtracted from our sample, resulting in a final sample of 3,090 companies. Table 1 presents the distribution of our sample in industries. Finally, we required that every firm-year observation follows IFRS. Thus, we cleared our sample from firm-years corresponded to other than IFRS standards, like local standards, for example. By doing so, we aim to achieve accounting uniformity in our research and thus more consistent results.

Insert Table 1 here

Our full sample, after imposing requirements for the available data, consists of 32,214 firm-year observations over the period 2005-2020, including 44 industries and 3,090 individual firms. The sample of the firm-year observations used in final regressions amounts to 5,137. In order to detect the existence of earnings management, estimate the accounting quality and calculate the control variables in our regressions, we collected data from Worldscope. Regarding the estimation of corporate sustainability performance we extracted data, in line with previous research (Lys et al., 2015; Velte, 2017, 2019) from ESG Refinitiv which provides a comprehensive dataset of ESG information. All variables used in every model have been winsorized at level 1% and 99% in order to eliminate outliers without reducing our observations. This way we make our models smoother, resulting in better estimations of the regressions.

3.2. Measurement of Earnings Management

3.2.1. Detection of Accrual-Based Earnings Management

According to the previous literature, the detection of accrual-based earnings management is based on estimating discretionary accruals, regarded as the residuals from the estimation of the non-discretionary or normal accruals. The sense is that total accruals are decomposed of their predicted and unexplained part. The latter captures the management distortion. As per Jones model (Jones, 1991), normal accruals are calculated as:

¹ These categories stand for: 60-Depository Institutions, 61- Non-Depository Credit Institutions, 62-Security and Commodity Brokers, Dealers, Exchanges, and Services, 63-Insurance Carriers, 65-Real Estate, 67-Holding and other Investment Offices. Retrieved from <https://siccode.com/>

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (11)$$

where:

- $TA_{i,t}$ = Total accruals of i 's company at year t , calculated as $\Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} - D\&A_{i,t}$;
- $\Delta CA_{i,t}$ = The change between Current Assets at year t and $t - 1$ of i 's company (WC02201);
- $\Delta CL_{i,t}$ = The change between Current Liabilities at year t and $t - 1$ of i 's company (WC03101);
- $\Delta Cash_{i,t}$ = The change between cash accounts and short – term investments at year t and $t - 1$ of i 's company (WC02001);
- $D\&A_{i,t}$ = Depretiation and Amortization at year t of i 's company (WC04051);
- $A_{i,t-1}$ = Total assets at the end of year $t - 1$ of i 's company (WC02999²);
- $\Delta REV_{i,t}$ = The change between Revenues at year t and $t - 1$ of i 's company (WC01001);
- $PPE_{i,t}$ = Net Property, Plant and Equipment of i 's company at year t (WC02501);
- $e_{i,t}$ = error term.

In our approach, the way to model total accruals (mentioned above) is consistent with previous studies (Dechow et al., 1995; Jones, 1991; Kothari et al., 2005). For our regression, we use annual cross-sectional data as suggested by DeFond and Jiambalvo (1994) and in line with past studies (Cohen & Zarowin, 2010; Subramanyam, 1996), instead of time-series data as in Jones model. This way, we better specify the model and relax the restrictions for data requirements (Kim et al., 2012). We categorize firms in industry sectors and regress our model for all firms in each industry and year, requiring at least eight observations for each group (Ferentinou & Anagnostopoulou, 2016; Velte, 2019), so as to estimate industry and year specific coefficients.

We estimate equation (11) by OLS for each year and each industry with parameters $\widehat{\alpha}_0$, $\widehat{\alpha}_1$, $\widehat{\alpha}_2$ and $\widehat{\alpha}_3$ and then subtract the result from the real prices of Total Accruals scaled by lagged Total Assets. We calculate this way the residuals named DA_J , which stand for the proxy of earnings management under Jones model. Specifically, we have:

$$DA_J_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left(\widehat{\alpha}_0 + \widehat{\alpha}_1 \frac{1}{A_{i,t-1}} + \widehat{\alpha}_2 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + \widehat{\alpha}_3 \frac{PPE_{i,t}}{A_{i,t-1}} \right) \quad (12)$$

Dechow et al. (1995) suggest Modified Jones Model in an effort to correct for the misspecification of Jones model in case of sales manipulation existence. As revenues are a component of normal accruals, the managerial distortion in them is not reflected in the discretionary component of total accruals as it should. The authors use credit sales as proxy for sales manipulation, as they argue their susceptibility to earnings management

² Worldscope item used for the corresponding variable.

through their recognition in contrast with revenues from cash sales. This approach is more inclusive and has been widely used in accruals-based earnings management research (DeFond & Park, 1997; Gras-Gil et al., 2016; Subramanyam, 1996). So, we also apply it in our research.

In modelling, the difference from Jones Model (1991) lies in the change in revenues between year t and $t-1$. Dechow et al. (1995) substitute it with change in revenues minus change in accounts receivables between year t and $t-1$. Non-discretionary accruals based on Modified Jones Model (Dechow et al., 1995) are calculated as:

$$\frac{TA_{i,t}}{A_{i,t-1}} = a_0 + a_1 \frac{1}{A_{i,t-1}} + a_2 \frac{\Delta(Rev-Rec)_{i,t}}{A_{i,t-1}} + a_3 \frac{PPE_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (13)$$

where:

$\Delta REC_{i,t}$ = The change between Account Receivables at year t and $t-1$ of i 's company (WC02051)

The other variables are defined as above.

Herein, the residuals from equation (13), named DA_MJ , represent the proxy for earnings management under Modified Jones (Dechow et al., 1995). They are calculated as follows:

$$DA_MJ_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left(\widehat{\alpha}_0 + \widehat{\alpha}_1 \frac{1}{A_{i,t-1}} + \widehat{\alpha}_2 \frac{\Delta(Rev-REC)_{i,t}}{A_{i,t-1}} + \widehat{\alpha}_3 \frac{PPE_{i,t}}{A_{i,t-1}} \right) \quad (14)$$

In order for our accrual-based earnings management detection to be more comprehensive, we further examine the two above-mentioned models adjusted for performance as suggested by Kothari et al. (2005). This augmentation in Jones (1991) and Modified Jones model (Dechow et al., 1995) has been widely adopted in relevant studies (Ferentinou & Anagnostopoulou, 2016; Kim et al., 2012; Martínez-Ferrero et al., 2015 a; Velte, 2019). This approach addresses issues regarding unusual past performance falsely perceived as AEM (Dechow et al., 1995; Guay et al., 1996). Abnormal performance predicts for mean-reversed performance in the future and thus for the behavior of accruals (Kothari et al., 2005), supported by evidence showing an association of accruals between past or current performance (Barth et al., 2001; Dechow et al., 1995). So, change in accruals stemming from unusual change in performance, as it is predicted, should not reflect to discretionary component of accruals.

As for modelling, nondiscretionary accruals based on Jones model (Jones, 1991) adjusted for performance as per Kothari et al. (2005) are expressed as:

$$\frac{TA_{i,t}}{A_{i,t-1}} = a_0 + a_1 \frac{1}{A_{i,t-1}} + a_2 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + a_3 \frac{PPE_{i,t}}{A_{i,t-1}} + a_4 \frac{NIBE_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (15)$$

where:

$NIBE_{i,t}$ = Net income before extraordinary items of i 's company at year t (WC01551).

The other variables are defined as above.

The residuals from equation (15) named DA_J_ROA represent the proxy for earnings management under Jones Model (1991) adjusted for performance by Kothari et al. (2005). They are calculated as follows:

$$DA_J_ROA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left(\widehat{\alpha}_0 + \widehat{\alpha}_1 \frac{1}{A_{i,t-1}} + \widehat{\alpha}_2 \frac{\Delta(Rev)_{i,t}}{A_{i,t-1}} + \widehat{\alpha}_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \widehat{\alpha}_4 \frac{NIBE_{i,t}}{A_{i,t-1}} \right) \quad (16)$$

Accordingly, normal accruals under Modified Jones Model augmented by a performance-related regressor $NIBE_{i,t}$ (Kothari et al. 2005) are expressed as:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{\Delta(Rev-Rec)_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \alpha_4 \frac{NIBE_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (17)$$

The residuals from equation (17) named DA_MJ_ROA represent the proxy for earnings management under Modified Jones Model (1991) adjusted for performance by Kothari et al. (2005). They are calculated as follows:

$$DA_MJ_ROA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left(\widehat{\alpha}_0 + \widehat{\alpha}_1 \frac{1}{A_{i,t-1}} + \widehat{\alpha}_2 \frac{\Delta(Rev-REC)_{i,t}}{A_{i,t-1}} + \widehat{\alpha}_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \widehat{\alpha}_4 \frac{NIBE_{i,t}}{A_{i,t-1}} \right) \quad (18)$$

The variables used in all four models above are scaled by lagged total assets in order to control for heteroskedasticity issues. Furthermore, there is included a constant term in all four models. As Kothari et al. (2005) argue, a constant term controls for heteroskedasticity not mitigated from the assets deflator. It also controls for scale issues regarding omitted size variables (Brown et al., 1999).

To sum up the four different measures of discretionary accruals that reflect the unexplained component of total accruals and thus constitute a proxy for accrual-based earnings manipulation we have:

$DA_J_{i,t}$	= Proxy for AEM under Jones model (Jones, 1991)
$DA_MJ_{i,t}$	= Proxy for AEM under Modified Jones model (Dechow et al., 1995)
$DA_J_ROA_{i,t}$	= Proxy for AEM under Jones model (Jones, 1991) adjusted for performance (Kothari et. al, 2005)
$DA_MJ_ROA_{i,t}$	= Proxy for AEM under Modified Jones model (Dechow et al., 1995) adjusted for performance (Kothari et. al, 2005)
t	= Subscript for year observation
i	= Subscript for firm observation

3.2.2. Measurement of Accounting Quality via the estimation of the quality of accruals

Despite the wide use of Jones model (Jones, 1991), Modified Jones model (Dechow et al., 1995) and variations/extensions of them, many researchers criticize their power to detect accrual-based earnings management. Their power is doubted when deployed in an economically plausible sample of firms (Dechow et al., 1995). It is possible for these models to detect earnings manipulation when the sample consists of many hundred firms. Guay et al. (1996) find evidence that existing accrual models, Jones and modified Jones models among them, are substantially misspecified in estimating discretionary accruals. It is supported that discretionary accrual models are subject to misclassification of normal or expected accruals as discretionary accruals, due to imprecise interpretation of the nondiscretionary accruals (Bernard & Skinner, 1996; Larcker & Richardson, 2004). Thus, detecting earnings manipulation only on the basis of discretionary accruals models, possibly leads to their under- or overestimation.

Considering the issues regarding the Jones and modified Jones models, we also deploy the model of Dechow and Dichev (2002) that lies in the detection of estimation errors in measuring the quality of accruals used as a proxy for accounting quality. Proper adjustment of accruals relative to the recognition of cash flows signals for accounting, and thus earnings quality. It has been argued that the ability of working capital accruals to properly reflect cash flow realizations signifies high accruals quality. Estimation errors in recorded accruals lead to low accounting quality. Dechow and Dichev (2002) propose that both unintentional and purposeful estimation errors imply low accounting quality. Apart from opportunistic incentives to manage accruals that are difficult to observe, there are firm and industry characteristics that affect accrual quality and are more easily discernible (Dechow & Dichev, 2002).

For the estimation of accrual quality through working capital accruals as per Dechow and Dichev (2002), the following equation is regressed cross-sectionally for each industry and year with at least eight firm-year observations per industry and year, for consistency with our previous estimations of proxies for accrual-based earnings management:

$$\frac{\Delta WC_{i,t}}{A_{i,t-1}} = a_0 + a_1 \frac{CFO_{i,t-1}}{A_{i,t-1}} + a_2 \frac{CFO_{i,t}}{A_{i,t-1}} + a_3 \frac{CFO_{i,t+1}}{A_{i,t-1}} + e_{i,t} \quad (19)$$

where:

- $\Delta WC_{i,t}$ = The change in working capital between year t and $t - 1$ of i 's company, calculated as $\Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t}$;
 - $\Delta STD_{i,t}$ = The change in Short Term Debt between year t and $t - 1$ of i 's company (WC03051);
 - $CFO_{i,t}$ = Net Cash Flow from Operations of i 's company at year t (WC04860);
- The other variables are defined as above.

The residuals from the above estimated regression (19) represent the accrual estimation errors and are used as a proxy for accounting quality, namely AQ_DD . Their calculation follows the sense of residuals' calculation analyzed in section 3.2.1, and thus is expressed as:

$$AQ_DD_{i,t} = \frac{\Delta WC_{i,t}}{A_{i,t-1}} - \left(\widehat{a}_0 + \widehat{a}_1 \frac{CFO_{i,t-1}}{A_{i,t-1}} + \widehat{a}_2 \frac{CFO_{i,t}}{A_{i,t-1}} + \widehat{a}_3 \frac{CFO_{i,t+1}}{A_{i,t-1}} \right) \quad (20)$$

As in this model the working capital accruals do not capture for other fundamentals than cash flows, this can lead to fictitious overestimated estimation errors that consist of both the explained and unexplained component of the fundamentals, such as PPE and change in Revenues. McNichols (2002) augments the model suggested by Dechow and Dichev (2002) by including change in sales and PP&E as regressors for change in normal working capital accruals, in order to eliminate estimation errors and enhance the regressors' completeness. Motivated by adoption of this extended approach in previous studies regarding accounting quality via the estimation of accruals quality (Anagnostopoulou, 2017; Baxter & Cotter, 2009; Francis et al., 2005; Rajgopal & Venkatachalam, 2011), we also examine the method of McNichols (McNichols, 2002).

We estimate the following the normal changes in working capital accruals under Dechow and Dichev (2002) model extended by McNichols (McNichols, 2002) cross-sectionally for each industry and year as:

$$\frac{\Delta WC_{i,t}}{A_{i,t-1}} = a_0 + a_1 \frac{CFO_{i,t-1}}{A_{i,t-1}} + a_2 \frac{CFO_{i,t}}{A_{i,t-1}} + a_3 \frac{CFO_{i,t+1}}{A_{i,t-1}} + a_4 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + a_5 \frac{GPPE_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (21)$$

where:

$GPPE_{i,t}$ = Gross Property, Plant and Equipment of i 's company at year t (WC02301)

The other variables are defined as above.

The residuals from the above estimated regression (21) represent the accrual estimation errors and are used as a second proxy for accounting quality, namely AQ_M_DD calculated as:

$$AQ_M_DD_{i,t} = \frac{\Delta WC_{i,t}}{A_{i,t-1}} - \left(\widehat{a}_0 + \widehat{a}_1 \frac{CFO_{i,t-1}}{A_{i,t-1}} + \widehat{a}_2 \frac{CFO_{i,t}}{A_{i,t-1}} + \widehat{a}_3 \frac{CFO_{i,t+1}}{A_{i,t-1}} + \widehat{a}_4 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + \widehat{a}_5 \frac{GPPE_{i,t}}{A_{i,t-1}} \right) \quad (22)$$

Both proxies for accounting quality, AQ_DD and AQ_M_DD are used in their absolute values, named $ABS_AQ_M_DD$ and $ABS_AQ_M_DD$ respectively, consistent with past studies (Anagnostopoulou, 2017; Baxter & Cotter, 2009). Larger absolute values of the residuals for each firm-year observation, signify poorer accounting, and thus lower earnings quality.

3.2.3. Detection of Real Earnings Management

In order to detect for REM, we adopt the three measures of sales manipulation, overproduction and discretionary expenses as suggested by Roychowdhury (2006). This approach is widely used in REM literature (Cho & Chun, 2016; Cohen et al., 2008; Cohen & Zarowin, 2010; Ferentinou & Anagnostopoulou, 2016).

Roychowdhury (2006) proposes that firms reduce their prices or offer lenient credit terms to boost their sales and temporarily reduce their discretionary expenditures, such as R&D and advertising to increase their profit margins. They also proceed to overproduction in order for the fixed cost per unit to be decreased, although at the expense of additional inventory costs. They proceed to such income-increasing operating activities so as to reach the desired earnings thresholds. REM is reflected in abnormally high production costs due to overproduction and abnormally low discretionary expenses due to reduction of discretionary expense. As for cash flows from operations, it is difficult to estimate how they are affected by REM. Analytically, sales manipulation and overproduction reflect in abnormally low cash flows from operations relative to sales, whereas reduction in discretionary accruals reflects in unusually high cash flows from operations relative to sales.

Consistent with our previous estimations, the following equations are regressed cross-sectionally for each industry and year, requiring at least eight observations per industry and year. Further, all variables are scaled by lagged total assets as to eliminate heteroskedasticity.

Normal CFOs, are expressed as a function of sales and change in sales:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = a_0 + a_1 \frac{1}{A_{i,t-1}} + a_2 \frac{Rev_{i,t}}{A_{i,t-1}} + a_3 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + e_{i,t} \quad (23)$$

where:

$Rev_{i,t}$ = Revenues at year t of i 's company

The other variables are defined as in section 3.1.

Abnormal cash flows from operations as a first proxy for REM, namely AB_CFO , are the residuals from the above regressed equation (23) and particularly the difference between actual and normal CFOs calculated through the estimated coefficients $\widehat{a}_0, \widehat{a}_1, \widehat{a}_2$ and \widehat{a}_3 . They are calculated as follows:

$$AB_CFO_{i,t} = \frac{CFO_{i,t}}{A_{i,t-1}} - \left(\widehat{a}_0 + \widehat{a}_1 \frac{1}{A_{i,t-1}} + \widehat{a}_2 \frac{Rev_{i,t}}{A_{i,t-1}} + \widehat{a}_3 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} \right) \quad (24)$$

Normal production costs consist of cost of goods sold plus changes in inventories in current year. Cost of goods sold are expressed as a function of contemporaneous sales, while current change in inventories is calculated as a function of change in sales for year

t plus change in sales of previous year $t-1$. Thus, normal production costs are expressed as a function of sales, change in sales in current year t and change in sales at year $t-1$:

$$\frac{PROD_{i,t}}{A_{i,t-1}} = a_0 + a_1 \frac{1}{A_{i,t-1}} + a_2 \frac{Rev_{i,t}}{A_{i,t-1}} + a_3 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + a_4 \frac{\Delta Rev_{i,t-1}}{A_{i,t-1}} + e_{i,t} \quad (25)$$

where:

$PROD_{i,t}$ = Cost of Goods Sold (WC01051) at year t and Change in Inventories (WC02101) between year t and $t-1$ of i 's company
 $\Delta Rev_{i,t-1}$ = Change in Revenues between year $t-1$ and $t-2$ of i 's company
The other variables are defined as in section 3.1.

Abnormal production costs as a second proxy for REM, namely AB_PROD , are the residuals from the above regressed equation (25) and are calculated as:

$$AB_PROD_{i,t} = \frac{PROD_{i,t}}{A_{i,t-1}} - \left(\widehat{a}_0 + \widehat{a}_1 \frac{1}{A_{i,t-1}} + \widehat{a}_2 \frac{Rev_{i,t}}{A_{i,t-1}} + \widehat{a}_3 \frac{\Delta Rev_{i,t}}{A_{i,t-1}} + \widehat{a}_4 \frac{\Delta Rev_{i,t-1}}{A_{i,t-1}} \right) \quad (26)$$

Following Roychowdhury (2006), normal discretionary expenditures are expressed as a function of past sales and not as of current sales as suggested by Dechow et al. (1998):

$$\frac{DISEXP_{i,t}}{A_{i,t-1}} = a_0 + a_1 \frac{1}{A_{i,t-1}} + a_2 \frac{Rev_{i,t-1}}{A_{i,t-1}} + e_{i,t} \quad (27)$$

where:

$DISEXP_{i,t}$ = SG & A (WC01101) plus R&D (WC01201) at year t of i 's company.
The other variables are defined as above.

Roychowdhury (2006) defines discretionary expenses as the aggregate of R&D, advertising and SG&A expenses. However, there is no available item in Worldscope for advertising costs. For this reason, discretionary expenses are defined only as Selling, General and Administrative Expenses plus Research and Development following Ferentinou and Anagnostopoulou (2016).

Abnormal discretionary accruals as a third proxy for REM, namely AB_DISEXP , are the residuals from the above regressed equation (27) and we calculate them as:

$$AB_DISEXP_{i,t} = \frac{DISEXP_{i,t}}{A_{i,t-1}} - \left(\widehat{a}_0 + \widehat{a}_1 \frac{1}{A_{i,t-1}} + \widehat{a}_2 \frac{Rev_{i,t-1}}{A_{i,t-1}} \right) \quad (28)$$

To sum up, we calculate three different proxies for REM following Roychowdhury (2006): AB_CFO for abnormal cash flows from operations, AB_PROD for abnormally low production costs and AB_DISEXP for abnormally low discretionary accruals. Following Cohen et al. (2008) and in line with past studies (Cho & Chun, 2016; Ferentinou & Anagnostopoulou, 2016; Kim et al., 2012), we use a single measure as a proxy for REM, namely REM , that combines the three measures for REM detection (AB_CFO , AB_PROD and AB_DISEXP). It is calculated as below:

$$REM_{i,t} = -1 * AB_CFO_{i,t} + 1 * AB_PROD_{i,t} - 1 * AB_DISEXP_{i,t} \quad (29)$$

Managers exercising income-increasing REM through discretionary expenditures such as advertising and maintenance, they temporarily defer the ones expensed the same period they occur. Exercising upwards REM through overproduction, reduces COGs as the fixed cost per unit declines, but increases inventories cost as the production surplus is not channeled through sales the same period. These incremental marginal costs lead to higher production costs relative to sales. Thus, overproduction leads to abnormally high production costs and abnormally low cash flows from operations. Furthermore, sales manipulation with price reductions leads to high production costs relative to sales and thus lower cash flows from operations, as the cash inflows from sales on discounts are lower. So, lower than expected values of *AB_DISEXP* and *AB_CFO* signify income-increasing REM, while higher than expected values of *AB_PROD* signify income-decreasing REM. Multiplying *AB_DISEXP* and *AB_CFO* by negative 1 (-1), we imply that the higher their value, the higher the upwards REM. Thus, from equation (29) it can be inferred that the higher the value of *REM* proxy the higher the upwards REM.

3.3. Measurement of Corporate Sustainability Performance

Consistent with the theoretical framework (Carroll, 1979; Elkington, 1997; Wood, 1991), CSP is closely related to Corporate Social Responsibility and lies in the social and environmental aspects of a company besides its economic dimension. Hummel and Ising (2015) interpret CSP in their model as a combined measure of employees, environment and community dimensions. Similarly, Manning et al. (2019) constructs the environmental performance score as a sum of standardized size and industry adjusted greenhouse gas emissions, energy consumption, total weight of waste and water withdrawal measures. He also defines social performance score as a sum of standardized size and industry adjusted employee training, lost time injury rate and employee turnover measures. The mean of environmental and social performance scores composes the measure for corporate sustainability performance. In our research we depict CSP on the basis of the above-mentioned studies as well as of the trend in literature implying that the combination of the social and environmental dimension represents the holistic corporate sustainability performance, as observed by Alshehhi et al. (2018). Following Lys et al. (2015), we include a combination of environmental and social score (*SOS_ENV_SCORE*), measured by the average of Environment Pillar Score (*ENSCORE*³) and Social Pillar Score (*SOSCORE*) for each firm-year observation. The definition of *ENSCORE* and *SOSCORE* is presented in Appendix B. According to ESG Refinitiv Database, each pillar score is z-scored for normalization and thus is comparable across firms. Each pillar score ranges between 0 and 100, and thus so does *SOS_ENV_SCORE*, implying that the higher the score signifies higher CSP.

³ ESG- Refinitiv item used for the corresponding variable.

We should note the combined measure of both social-environmental and corporate governance dimension as a proxy for CSP has been widely used in previous studies (García-Sánchez et al., 2020; Grimaldi et al., 2020; Jadoon et al., 2021; Velte, 2017, 2019). However, in our model we discriminate between social-environmental dimension and corporate governance. Jadoon et al. (2021) support that social-environmental dimension focus on basic operational business strategies, whereas corporate governance dimension lies in directing and reporting these activities. They find that investors perceive CSP as an alternative measure for corporate governance dimension. Thus, CSP signals for corporate governance value. Besides this causal interrelation between the CSP dimensions (Budsaratragoon & Jitmaneroj, 2019), previous research shows that corporate governance significantly affects firm performance and corporate sustainability (Evans et al., 2006) as well as financial disclosure (Cheng & Courtenay, 2006). So, we include a variable that captures corporate governance performance, as done in previous studies (Kim et al., 2012; Hummel & Ising, 2015; Labelle et al., 2010). For a more comprehensive approach, we measure corporate governance in two different ways. First, through the corporate governance score (*GOV_SCORE*), given by the Governance Pillar Score (CGSCORE) from ESG Refinitiv. Second, we use three different measures that reflect corporate governance:

- Available Policy for Board Independence (*POL_BOARD_IND*), measured by Policy Board Independence (CGBSDP0012) after being transformed to a binary variable taking value of 1 for “YES” and value 0 for “NO”.
- CEO and Chairman duality (*CEO_CHAIR_SEP*), measured by CEO-Chairman Separation (CGBSO09V) after being transformed to a binary variable taking value of 1 for “YES” and value 0 for “NO”.
- Percentage of independent Board members (*POL_BOARD_IND*), measured by Independent Board Members (CGBSO07V) after scaled by 100.

The definitions of the ESG Refinitiv items are presented in Appendix B.

These variables used as proxies for corporate governance, instead of the *GOV_SCORE* calculated by analysts of Thomson Reuters, have been identified in prior research (Chen et al., 2015; Katmon & Al-Farooque, 2019; Khalil & Ozkan, 2016; Krause & Semadeni, 2013; Lippolis & Grimaldi, 2020).

For model completeness purposes, we include in our model a variable (*CSR_REPORTING*) indicating whether a firm publishes a sustainability report and particularly a CSR report. We measure it by ESG Refinitiv item named CSR Sustainability Reporting (CGVSDP026) after transforming it to a binary variable, taking value 1 for “YES” and 0 for “NO”. There is no consensus regarding the relation of CSR Reporting and earnings management. On one hand, CSR reporting as a form of improving firm reputation (Lev et al., 2010) motivates managers to mask their earnings distortion activities (Kim et al., 2012). On the other hand, as a form of increasing information transparency and accountability, deters earnings manipulation due to firms’ susceptibility to scrutiny from stakeholders (Watts & Zimmerman, 1990; Zang, 2012).

Summarizing our explanatory regressors we have:

$SOS_ENV_SCORE_{i,t}$	= Average between Social Pillar Score (SOSCORE) and Environment Pillar Score (ENCORE)
$GOV_SCORE_{i,t}$	= Governance Pillar Score (CGSCORE)
$IND_BOARD_MEMB_{i,t}$	Independent Board Members (CGBSO07V)
$POL_BOARD_IND_{i,t}$	Policy Board Independence (CGBSDP0012)
$CEO_CHAIR_SEP_{i,t}$	CEO-Chairman Separation (CGBSO09V)
$CSR_REPORTING_{i,t}$	CSR Sustainability Reporting (CGVSDP026)
i	= Subscript for firm
t	= Subscript for year

We clarify that POL_BOARD_IND , CEO_CHAIR_SEP and POL_BOARD_IND are substitutes for GOV_SCORE .

3.4. Control Variables

In order to avoid the omitted-variable bias⁴ and other statistical issues we include in our model control variables that can affect earnings management, corporate sustainable behavior or financial performance based on past literature. These variables are widely used in common research (Bozzolan et al., 2015; Cho & Chun, 2016; Kim et al., 2012; Velte, 2019).

Size

Previous studies show the importance for a size variable to be included in research regarding earnings manipulation, as it possibly explains a significant part of the variation in earnings management (Chih et al., 2008; Kim et al., 2012; Roychowdhury, 2006). It also affects the stakeholders' interest of financial and non-financial reporting, as past research shows (Kim et al., 2012). Furthermore, evidence shows an ambiguous relation between firm size and CSR performance, positive (Prior, 2008) and negative (Kim et al., 2012), while a positive impact on earnings quality (Dechow & Dichev, 2002; Francis et al., 2004). So, we include in our model a variable to control for the size effect ($SIZE$), measured by the natural logarithm of total assets as used in previous studies, similar to other studies (García-Sánchez et al., 2020; Grimaldi et al., 2020; Martínez-Ferrero et al., 2015 a). The impact of company's size on earnings management is arguable. On one side, larger companies face more capital market related and regulation restrictions, and thus are incentivized to exercise earnings management, in order to meet the requirements. On the other side, larger companies publishing financial reports are subject to stricter external audit and scrutiny (Watts & Zimmerman, 1990), and thus are discouraged to proceed to

⁴ Omitted variable bias (OVB) arises in the OLS estimators when one or more relevant variables correlated with one or more of the included independent variables is left out of the regression (Wooldridge, 2013).

earnings management (Gras-Gil et al., 2016). We adopt the second opinion and expect a negative sign of size.

Leverage

We include a variable that captures firm' leverage level (*LEV*) in line with prior research (Cho & Chun, 2016; Kim et al., 2012), measured by long-term-debt over total assets as suggested by Velte (2019). Evidence shows that highly leveraged firms are positively related to earnings management (Anagnostopoulou & Tsekrekos, 2015; Buerter et al., 2020). Similarly, managers are motivated to exercise upwards earnings management to avoid debt-covenant violations and bankruptcy (Dechow & Skinner, 2000; DeFond & Jiambalvo, 1994; Park & Shin, 2004), suggesting a positive relation between the level of discretionary accruals and the level of leverage (Gras-Gil et al., 2016). However, there is also evidence indicating a negative relation (Chih et al., 2008; Toukabri et al., 2014) implying that creditor's strict monitoring deters earnings management practices (Toukabri et al., 2014). We assume that highly leveraged firms are more prone to distort their earnings, expecting a positive sign.

Growth

We also include in our models a variable indicative of growth *MTBVE*, measured by the ratio of market value of equity book value of equity, following past studies (Bozzolan et al., 2015; Roychowdhury, 2006). Firm growth can possibly reflect a substantial portion of variation in earnings management (Roychowdhury, 2006). Evidence shows that the impact of negative earnings news is asymmetrically more adverse for high-growth firms (Skinner & Sloan, 2002) and this motivates managers to engage in earnings management practices in order meet earnings thresholds (Bozzolan et al., 2015). Furthermore, growing firms are more pronounced to earnings management practices, as it is more imperative for them to hit specific earnings targets (Chih et al., 2008). Thus, we predict a positive relation between *MTBVE* and earnings management.

Performance

We include a variable that captures the effect of firm performance (*NIBE_TA*), measured by net income before extraordinary items scaled by Total Assets, similar to past studies (García-Sánchez et al., 2020; Hummel & Ising, 2015). Evidence shows that there is a correlation between discretionary accruals and performance (Dechow et al., 1995; Hummel & Ising, 2015). Chen (2010) finds evidence that low profitability firms are more pronounced in earnings distortion. Similarly, Toukabri et al. (2014) prove that firms with strong financial performance do not proceed to earnings management practices. So, we assume a negative impact on earnings management.

To summarize, our control variables included in all research model are:

$SIZE_{i,t}$ = Natural Logarithm of Total Assets (WC02999)

$LEV_{i,t}$ = Long Term Debt (WC03251) scaled by Total Assets (WC02999)

$NIBE_TA_{i,t}$ = Net Income Before Extra Items/Preferred Dividends (WC01551) scaled by Total Assets (WC02999)

$MTBVE_{i,t}$ = Market To Book Value (MTBV)
 i = Subscript for firm
 t = Subscript for year

3.5. Research Models

In order to examine the relation between CSP and AEM we estimate the following equations using OLS and White's heteroskedasticity robust standard errors for panel data:

$$AEM_{i,t} = SOS_ENV_SCORE_{i,t} + GOV_SCORE_{i,t} + CSR_REPORTING_{i,t} + SIZE_{i,t} + LEV_{i,t} + NIBE_TA_{i,t} + MTBVE_{i,t} + e_{i,t} \quad (30)$$

Where AEM stands for twelve different variations of proxies for AEM presented as in section 3.2.1.:

ABS_DA_J = The Absolute values of DA_J
 $POSITIVE_DA_J$ = The Positive values of DA_J
 $NEGATIVE_DA_J$ = The Absolute values of negative DA_J
 ABS_DA_MJ = The Absolute values of DA_MJ
 $POSITIVE_DA_MJ$ = The Positive values of DA_MJ
 $NEGATIVE_DA_MJ$ = The Absolute values of negative DA_MJ
 $ABS_DA_J_ROA$ = The Absolute values of DA_J_ROA
 $POSITIVE_DA_J_ROA$ = The Positive values of DA_J_ROA
 $NEGATIVE_DA_J_ROA$ = The Absolute values of negative DA_J_ROA
 $ABS_DA_MJ_ROA$ = The Absolute values of DA_MJ_ROA
 $POSITIVE_DA_MJ_ROA$ = The Positive values of DA_MJ_ROA
 $NEGATIVE_DA_MJ_ROA$ = The Absolute values of negative DA_MJ_ROA

Following previous studies (Cohen et al., 2008; Gras-Gil et al., 2016) we use the absolute values of discretionary accruals proxies detect for AEM existence. In order to test for upwards or downwards AEM we separate each proxy between the positive and negative discretionary accruals values, and then use their absolute values to estimate equation (30), following Kim et al. (2012). So, we can have a better insight for AEM.

In order to examine the relation between CSP and accrual estimation errors as a proxy for Accounting Quality we estimate the following equations using year fixed-effects OLS and White's heteroskedasticity robust standard errors for panel data:

$$AQ_{i,t} = SOS_ENV_SCORE_{i,t} + GOV_SCORE_{i,t} + CSR_REPORTING_{i,t} + SIZE_{i,t} + LEV_{i,t} + NIBE_TA_{i,t} + MTBVE_{i,t} + \sum YEAR_t + e_{i,t} \quad (31)$$

where:

AQ stands for $ABS_AQ_M_DD$ and $ABS_AQ_M_DD$ as presented in section 3.2.2
 $\sum YEAR_t$ = a year dummy taking value 1 if year is t and 0 otherwise

Following the same regression, but with different controls for corporate governance we have:

$$AQ_{i,t} = SOS_ENV_SCORE_{i,t} + CEO_CHAIR_SEP_{i,t} + IND_BOARD_MEMB_{i,t} + POL_BOARD_IND_{i,t} + CSR_REPORTING_{i,t} + SIZE_{i,t} + LEV_{i,t} + NIBE_TA_{i,t} + MTBVE_{i,t} + \sum YEAR_t + e_{i,t} \quad (32)$$

In order to examine the relation between CSP and REM, we estimate the following equations using year fixed-effects OLS and White's heteroskedasticity robust standard errors for panel data:

$$REM_{i,t} = SOS_ENV_SCORE_{i,t} + GOV_SCORE_{i,t} + CSR_REPORTING_{i,t} + SIZE_{i,t} + LEV_{i,t} + NIBE_TA_{i,t} + MTBVE_{i,t} + \sum YEAR_t + e_{i,t} \quad (33)$$

where:

$\sum YEAR_t$ = a year dummy taking value 1 if year is t and 0 otherwise

Following the same regression but with different control for corporate governance we have:

$$REM_{i,t} = SOS_ENV_SCORE_{i,t} + CEO_CHAIR_SEP_{i,t} + IND_BOARD_MEMB_{i,t} + POL_BOARD_IND_{i,t} + CSR_REPORTING_{i,t} + SIZE_{i,t} + LEV_{i,t} + NIBE_TA_{i,t} + MTBVE_{i,t} + \sum YEAR_t + e_{i,t} \quad (34)$$

Finally, following Choi et al. (2013), we examine how the proxies for earnings management and CSP affect *CSR_REPORTING*. So, the proxies for earnings manipulations are independent variables and *CSR_REPORTING* the dependent one. As the dependent variable is binary, we estimate a probit model, with year fixed effects and White's heteroskedasticity robust standard errors for panel data:

$$CSR_REPORTING_{i,t} = Pr (SOS_ENV_SCORE_{i,t} + GOV_SCORE_{i,t} + EM_{i,t} + SIZE_{i,t} + LEV_{i,t} + NIBE_TA_{i,t} + MTBVE_{i,t} + \sum YEAR_t + e_{i,t}) \quad (35)$$

where *EM* stands for five different proxies of AEM: *ABS_DA_J*, *ABS_DA_MJ*, *ABS_DA_J_ROA*, *ABS_DA_MJ_ROA* and *REM*.

All variables in the regressions above have been winsorized at level 1%-99% in order for the outliers to be eliminated.

4. Empirical Findings

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics for the variables used to estimate the regressions explained in section 3.5. regarding our sample (firm-year observations) during the period 2005-2020. We include the number of observations (obs), mean, standard deviation (sd), first and third quartiles (Q1 and Q3). The results show that the proxy for CSP (*SOS_ENV_SCORE*), has mean and median value of 56.24 and 58.71 respectively on a range between 0 and 100 as set by ESG Refinitiv, with our sample firms present a better CSP than previous studies (Hummel & Ising, 2015; Prior et al., 2008) probably in the light of companies' and stakeholders' growing consciousness of public companies and investors towards ESG issues the last years (Rezaee, 2016) as well as because of the different metrics used to interpret CSP. We also provide evidence that our sample firms exercise accrual-based earnings management, both upwards and downwards, with the latter being more pronounced and more intense. The mean of absolute values of AEM measures (around 0.059) is larger than that of Hummel & Ising (2015) and Prior et al. (2008), but lower than that of Kim et al. (2012). Furthermore, we observe that our accrual estimation errors as well as our REM proxy have a lower mean than the mean of the discretionary accruals of our firm sample, with the REM proxy indicating downwards real earnings management. This is in contrast to relatively larger and positive mean value of REM proxy by Kim et al. (2012). Regarding our control variables, 82.42% of our sample firms issue a CSR report, although it not being imperative rather than the larger public firms, implying that they convey CSR disclosure with better their financial performance. The long-term debt of our sample amounts to 21.24% of total assets, while the annual profitability (*NIBE_TA*) amounts to 3.53%, lower than the 4.8% of Hummel and Ising (2015). The growth variable (*MTBVE*) has a mean of 2.62, lower than that of Kim et al. (2012), justifying that American firms are more growth oriented.

Insert Table 2 here

Table 3 reports pair-wise Pearson correlation coefficients with the corresponding statistical significance between absolute values of proxies for AEM [(*ABS_DA_J* and *ABS_DA_MJ_ROA* under the 2 AEM models Jones (1991) and Modified Jones (Dechow et al., 2005), adjusted for ROA (Kothari et al., 2005), respectively], the absolute values of accrual quality measure [*ABS_AQ_M_DD* under the Dechow and Dichev (2002) model as extended by McNichols (2002)], REM measure (*REM* as combination proxy of Roychowdhury's (2006) REM measures as suggested by (Cohen et al., 2008)], proxy for CSP (*SOS_ENV_SCORE* under the interpretation of Lys et al. (2015) and control variables for corporate governance (*GOV_SCORE*), the issuance or not of CSR Reporting (*CSR_REPORTING*), firm size (*SIZE*), leverage level (*LEV*), firm growth (*MTBVE*) and firm performance (*NIBE_TA*). The results illustrate a negative significant correlation between CSP measure and AEM as well as accruals quality measure, but a positive insignificant correlation between CSP and REM measure. The same arises for *CSR_REPORTING* regarding the earnings management proxies. We assume that as the firm-year observations for REM measure are quite less than the other measures for earnings management, the correlation coefficient can be distortive. We also provide evidence that *GOV_SCORE* is significantly and highly positive correlated with *SOS_ENV_SCORE* which justifies our decision to include a control variable for corporate

governance as a standalone explanatory regressor. *GOV_SCORE* is also significantly correlated with earnings management proxies (negatively for AEM and accruals accounting, positively for REM). The control variables of firm size (*SIZE*), leverage level (*LEV*), firm growth (*MTBVE*) and firm performance (*NIBE_TA*) are significantly correlated with all earnings management proxies, indicating that they are substantial determinants of earnings manipulation. Our results are similar to Hummel and Ising, (2015) and indicate that sustainability performance negatively affects earnings management, except for REM which needs to be examined more thoroughly.

Insert Table 3 here

4.2. Empirical results and interpretation

AEM

Tables 4 and 5 report the results from the estimated equations regarding the relationship between CSP and AEM (12 regressions based on equation (30) under a variation of proxies for AEM). We provide strong evidence that CSP is negatively associated with AEM at 1% significance level, with results being consistent for all 4 proxies (*ABS_DA_J*, *ABS_DA_MJ*, *ABS_DA_J_ROA*, and *ABS_DA_MJ_ROA*) representing the absolute values of discretionary accruals under the 4 AEM models [Jones (1991), Modified Jones (Dechow et al., 2005), Jones and Modified Jones model adjusted for ROA (Kothari et al., 2005), respectively]. The results regarding the proxies of the absolute negative values of discretionary accruals under the 4 AEM models indicate a negative and significant relation between downwards AEM and CSP (1% level of significance). Our results are consistent with previous studies (Chih et al., 2008; Gras-Gil et al., 2016). As for upwards AEM proxies (*POSITIVE_DA_J*, *POSITIVE_DA_MJ*, *POSITIVE_DA_J_ROA*, and *POSITIVE_DA_MJ_ROA*), our results show that there's a negative relation, though of weaker significance (5% significance level for Jones-ROA adjusted model, 1% significance level for Modified Jones-ROA adjusted model), except for the Modified Jones model (no statistical significance). We find evidence consistent with Hummel and Ising (2015) regarding absolute and income-increasing AEM. The authors find no significant relation of income decreasing AEM, as distinct from our strong negative relations. We imply that the more a firm adopts sustainable performance behavior concerning social and environmental issues, the less it engages in accrual-based earnings manipulation practices.

Regarding our control variables, we find unanimous results from 12 regressions that there no statistical significance between AEM and corporate governance as well as CSR Reporting, in line with Hummel and Ising (2015) and in contradiction to the proposal of Forker (1992) that the corporate governance enhances the quality of financial disclosure and thus deters from earnings management practices. Further, size is found to be negatively associated with AEM (at 1% significance level for the 12 regressions) as we expected, signifying that the larger the firm, the less it proceeds to earnings distortions. This is consistent with theory assuming that the susceptibility of large, public firms to

scrutiny from auditors and shareholders discourages the adoption of earnings misstatement. We also prove the expected negative impact of financial performance on AEM, in line with previous studies (Chen, 2010; Toukabri et al., 2014). Our control variable for growth, MTBVE, is significant and positive with absolute and positive AEM, supporting that firms are motivated to manage their earnings upwards in order to meet earnings thresholds that capital market impose (Bozzolan et al., 2015; Chih et al., 2008). As for leverage level, the results indicate that firms with high level of debts engage in absolute and income increasing AEM, but not in income decreasing AEM, indicating that they overstate their earnings in order to avoid debt-covenant violations or bankruptcy (DeFond & Jiambalvo, 1994; Park & Shin, 2004).

Insert Table 4 and Table 5 here

Quality of accruals

The estimations of regressions regarding accounting quality via estimating the quality of accruals are presented in Table 6. We estimate 4 regressions based on equations (30) and (31), including the model of Dechow and Dichev (2002) and the augmented version of it as suggested by (McNichols, 2002), both examined for two different interpretations of the control variable regarding corporate governance as explained in section 3.5. Our results strongly indicate that sustainability performance has a negative effect on estimation errors, implying that less accrual estimation errors signal for better accounting, and thus earnings quality, consistent with Hong and Andersen (2011). The negative sign is significant at level 1% for all 4 regressions.

As for the corporate governance when defined as Corporate Governance Pillar Score set by ESG Refinitiv, it presents a positive and weak relation with earnings quality only through the Dechow and Dichev (2002) model. Considering the other interpretation of corporate governance through 3 different variables (*CEO_CHAIR_SEP*, *POL_BOARD_IND*, *IND_BOARD_MEMB*), having a policy regarding the Board Independence signals for earnings quality (negative relation of *POL_BOARD_IND* with accrual estimation errors at 5% significance level). This is supported by the fact that independent directors, as less involved in business operations, can better monitor business practices in the aspects of transparency and long-term value maximization (Ahmed et al., 2006; Cheng & Courtenay, 2006).

Consistent with our findings in the AEM model, we provide strong evidence that growth level is positively linked to poor earnings quality as well as that CSR reporting has not a statistically significant impact on it. The estimated coefficients of control variables illustrate a significant and positive relation between size, leverage level, and performance with earnings quality for all regressions (at 1% significance level for *SIZE* and *LEV* and 5% for *NIBE_TA*). As for the leverage level, which has opposite direction from the one estimated in the AEM model, we can infer that managers of high leveraged firms are discouraged to misstate their earnings as creditors inspect closely and thoroughly their financials (Toukabri et al., 2014).

Insert Table 6 here

REM

Tables 7 reports the results from the estimated equations regarding the relationship between CSP and REM [2 regressions based on equation (33) and (34)]. *REM* represents a combination of 3 different measures of REM including abnormal cash flows from operations (*AB_CFO*), abnormally low production cost (*AB_PROD*) and abnormally low discretionary expenditures (*AB_DISEXP*) as explained in section 3.2.2. Our evidence shows that CSP has a strong and negative impact on REM for both regressions (1% level of significance), in line with previous studies (Kim et. al, 2012; Cho & Chun, 2016).

Considering corporate governance, we provide contradicting results. When interpreted as the Governance Pillar Score measured by the analysts of Thomson Reuters, it has no statistical significance. However, with the other interpretation we find a strong, negative relationship between the availability of Policy for Board Independence as well as the percentage of independent board members and REM. This is consistent with previous literature (Ahmed et al., 2006; Cheng & Courtenay, 2006). Concerning the CEO duality, we find that is negatively correlated to REM, probably supporting the stewardship theory under which CEOs are appropriate to monitor the company rather than opportunistically (L. Donaldson & Davis, 1991). As for the control variables, it is of interest that size is significantly and positively correlated with REM in contrast to what we found for size in AEM and accruals accounting quality model. This indicates that larger firms engage more in real earnings management, in line with Cho and Chun (2016), probably due to the capital market's pressure to meet earnings thresholds. We also provide evidence that performance and growth is negatively and significantly associated, while the leverage level positively. Similar to the other models we examined, the variable *CSR_REPORTING* is not statistically significant.

Insert Table 7 here

CSR-Reporting-probit model

Tables 8 reports the results from the estimated equations regarding the impact of CSP on CSR Reporting (5 regressions based on equation (35)). In our supplementary analysis, we ran the probit model where CSR Reporting dummy variable is the dependent, and the independent variables are CSP and for each of the 5 regression we use a different proxy for earnings management. Particularly, we use the 4 proxies for AEM (*ABS_DA_J*, *ABS_DA_MJ*, *ABS_DA_J_ROA*, *ABS_DA_MJ_ROA*, one for each regression) and the proxy for REM (*REM*). Our results strongly indicate that sustainability performance is positively and significantly associated with the issuance of CSR, as we expected. The results are consistent for all 5 regressions (significant and positive sign of *SOS_ENV_SCORE* at 1% significance level). Our results imply that the higher the sustainability performance is, the higher the probability is for firms to issue a CSR report,

even if they do not have to. This is inferred from the fact that our sample firms, being selected by the Databases of Refinitiv, are not limited to large, listed firms that are obliged to issue a CSR Report as NFRD requires. As for the earnings management proxies we find evidence that accrual-based earnings management is significantly and negatively associated with CSR Reporting, for both the ROA Adjusted Jones (1991) and the ROA Adjusted Modified Jones model (Dechow et al., 1995) by Kothari et al. (2005) (at 5% significance level). The other earnings management proxies are not statistically significant. Furthermore, our results show that firms with good corporate governance performance, high leverage level and high performance issue a CSR report (significant and positive relation of *GOV_SCORE*, *LEV* and *NIBE_TA* with *CSR_REPORTING* at 1% significance level).

Insert Table 8 here

Summarizing our empirical findings, we find strong evidence that CSP is negatively associated with earnings management concerning firms in the Eurozone. We examine three different interpretations of earnings management, through AEM (Dechow et al., 1995; Kothari et al., 2005; Jones, 1991), quality of accruals (Dechow & Dichev, 2002; McNichols, 2002) and REM (Roychowdhury, 2006) as well as several interpretation of them. We define CSP as the average of Environment Pillar Score (ENSCORE) and Social Pillar Score (SOSCORE) for all regressions (Hummel & Ising, 2015; Lys et al., 2015), as given by the analysts of ESG Refinitiv. We control our models for corporate governance (two ways of interpretation), firm size, leverage level, firm growth, and profitability on the basis past research in order to avoid the omitted variables bias. A total of 12 regression equations are estimated for AEM, 4 for accruals quality and 2 for REM, all following the same pattern (explained in section 3.5.). The results from 18 OLS regressions using White's heteroskedasticity robust standard errors are homogenous regarding that CSP is negatively linked to earnings management at 1% statistical significance. Our results, consistent with our first hypothesis, indicate that Eurozone public firms that adopt a sustainable behavior regarding the society and environment, are also driven by consciousness and long-term perspectives in their business operations. In the absence of managerial opportunism, they present transparent and high-quality financial reports. As Gelb and Strawser (2001) propose: "increased disclosure is a form of socially responsible behavior".

5. Conclusion

This thesis examines the impact of Corporate Sustainability Performance (CSP) on earnings management with respect to two contradicting hypotheses. The first hypothesis (H1), based on stakeholder theory (Freeman, 1984) and stewardship theory (Davis et al., 1997), assumes that managers adopting CSR practices lead the company with transparency and accountability to stakeholders and provide valid financial reporting and non-financial reporting (Velayutham, 2018; Velte, 2017, 2019). Managers desire to meet the various and heterogenous stakeholders' needs, as this is firm value increasing and secures firm's sustainability. Thus, there is a negative relation between CSP and earnings

management. The second hypothesis (H2), based on agency theory, suggests that managers adopt CSR practices to conceal their earnings distortions (Prior et al., 2008) and mislead stakeholders for their transparency (Davis et al., 1997). This misconduct is more pronounced when a company serves multiple objectives (Chih et al., 2008; Gargouri et al., 2010). This managerial opportunism approach suggests a positive relation between CSP and earnings management. The existing literature for this issue refers mostly to studies on U.S. firms and mainly indicates that sustainability performance has a negative impact on earnings management (Velte, 2020).

We investigate our issue for the Eurozone area during 2005-2020, only for firms following IFRS. The European Union made the adoption of IFRS compulsory for listed firms in 2005. We use a sample of 3,090 firms, which leads to 32,214 firm-year observations. From the data sample, 5,137 firm-year observations are included in the final regressing models. We measure earnings management through discretionary accruals, accruals quality and real earnings management. For AEM, we employ 4 models, namely Jones (1991), modified Jones (1991) by Dechow et al. (1995) and ROA-adjusted Jones and modified Jones (1991) model by Kothari et al. (2005). For the measurement of the quality of accruals, we employ the model of Dechow and Dichev (2002) and its augmented form as suggested by McNichols (2002). Regarding sustainability performance, we measure it, following previous studies (Lys et al., 2015; Manning et al., 2019), as a combined construct of Social Pillar Score (SOSCORE) and the Environment Pillar Score (ENSCORE) provided in ESG Refinitiv Database (formerly ASSET4). Additionally, we use a corporate governance variable in our model, as suggested in common research (Hummel & Ising, 2015; Kim et al., 2012), as well as various control variables in order to avoid the omitted-variable bias (Bozzolan et al., 2015; Cho & Chun, 2016). As a supplementary analysis, we test how CSP affects the choice to issue a CSR Report, using a probit model where the dependent variable is the dummy variable of CSR Report.

Our results strongly indicate that the more sustainable a firm is, the less it engages in earnings management, consistent with all three earnings management measures. Particularly, CSP is significantly and negatively associated with AEM, accruals quality errors and REM. Thus, the first hypothesis based on stakeholder theory is satisfied. Our findings are in line with previous literature (Hong & Andersen, 2011; Hummel & Ising, 2015; Kim et al., 2012; Labelle et al., 2010). The impact of corporate governance performance on earnings management presents contradictory results, while CSR Reporting has no statistically significant impact on earnings management. However, additional tests on CSR Reporting indicates it being positively and significantly affected by CSP. This implies that the higher the sustainability performance is, the higher the probability is for firms to issue a CSR report, even if they do not have to, as our sample covers not only large firms that are obliged to issue a CSR report according to the NFRD.

From our results, some useful illustrations can be inferred. The US results are confirmed for Eurozone, showing that relevant results can be generalized, and further indicating that firm's commitment to sustainability performance is also associated with increased

responsibility with respect to not trying to achieve financial reporting targets or low accruals quality. For further and more complete research, we suggest the inverse causality of the relationship, namely the effect of earnings management on CSP, to be examined thoroughly, as it is less pronounced in common literature (Velte, 2020).

Tables

Table 1: Industry Distribution of companies' sample

Industry	Number of companies	Percent of Sample
Business Services	521	16.86%
Wholesale	157	5.08%
Retail	152	4.92%
Machinery	138	4.47%
Construction	126	4.08%
Electronic Equipment	121	3.92%
Construction Materials	116	3.75%
Computers	116	3.75%
Transportation	115	3.72%
Utilities	113	3.66%
Communication	102	3.30%
Entertainment	87	2.82%
Food Products	86	2.78%
Pharmaceutical Products	85	2.75%
Consumer Goods	83	2.69%
Automobiles and Trucks	78	2.52%
Chemicals	77	2.49%
Restaurants, Hotels, Motels	68	2.20%
Steel Works Etc	67	2.17%
Medical Equipment	59	1.91%
Apparel	54	1.75%
Business Supplies	47	1.52%
Beer & Liquor	45	1.46%
Textiles	45	1.46%
Agriculture	44	1.42%
Printing and Publishing	44	1.42%
Healthcare	41	1.33%
Petroleum and Natural Gas	39	1.26%
Recreation	36	1.17%
Electrical Equipment	36	1.17%
Rubber and Plastic Products	35	1.13%
Personal Services	25	0.81%
Non-Metallic and Industrial Metal Mining	20	0.65%

Shipping Containers	19	0.61%
Aircraft	18	0.58%
Measuring and Control Equipment	18	0.58%
Other	15	0.49%
Fabricated Products	13	0.42%
Shipbuilding, Railroad Equipment	12	0.39%
Candy & Soda	7	0.23%
Precious Metals	5	0.16%
Defense	2	0.06%
Coal	2	0.06%
Tobacco Products	1	0.03%
Total	3,090	100%

Table 2: Descriptive Statistics of basic variables used in regressions

Variables	Q1	mean	Median	Q3	sd	N
ABS_DA_J	0.0170	0.0581	0.0388	0.0731	0.0680	5,137
ABS_DA_MJ	0.0173	0.0583	0.0392	0.0736	0.0677	5,137
ABS_DA_J_ROA	0.0179	0.0598	0.0408	0.0765	0.0683	5,137
ABS_DA_MJ_ROA	0.0180	0.0599	0.0405	0.0761	0.0685	5,137
POSITIVE_DA_						
MJ_ROA	0.0168	0.0569	0.0387	0.0720	0.0657	2,382
NEGATIVE_DA_						
MJ_ROA	0.0191	0.0621	0.0424	0.0792	0.0677	2,755
ABS_AQ_DD	0.0088	0.0334	0.0207	0.0416	0.0411	4,540
ABS_AQ_M_DD	0.0096	0.0346	0.0212	0.0438	0.0423	4,540
REM	-0.1779	-0.0397	-0.0175	0.1279	0.2958	2,095
SOS_ENV_SCORE	38.6850	56.2396	59.7050	76.0450	23.9719	5,137
GOV_SCORE	31.6500	49.6145	49.5800	67.6600	22.3513	5,137
CSR_REPORTING	1.0000	0.8242	1.0000	1.0000	0.3807	5,137
SIZE	14.4256	15.4411	15.3848	16.5173	1.5197	5,137
LEV	0.1055	0.2124	0.1918	0.2975	0.1515	5,137
NIBE_TA	0.0137	0.0353	0.0378	0.0655	0.0842	5,137
MTBVE	1.1900	2.6207	1.9200	3.1700	2.7413	5,137

Table 3: Pairwise Correlation Coefficients of basic variables

	ABS_ DA_J	ABS_DA MJ_ROA	ABS_ AQ_ M_DD	REM	SOS_ ENV_ SCORE	GOV_ SCORE	CSR_ REPOR- TING	SIZE	LEV	MTB- VE	NIBE_ TA
ABS_ DA_J	1										
ABS_DA MJ_ROA	0.8907 ***	1									
ABS_ AQ_ M_DD	0.5092 ***	0.4743 ***	1								
REM	0.0282 **	0.0334 *	-0.0057	1							
SOS_ ENV_ SCORE	-0.1663 ***	-0.1724 ***	-0.1762 ***	0.0278	1						
GOV_ SCORE	-0.0834 ***	-0.0876 ***	-0.1022 ***	0.0425 **	0.4531 ***	1					
CSR_ REPOR- TING	-0.1085 ***	-0.1214 ***	-0.1177 ***	0.0212	0.6469 ***	0.2823 ***	1				
SIZE	-0.247 ***	-0.2378 ***	-0.2549 ***	0.0411 **	0.5771 ***	0.3766 ***	0.291	1			
LEV	0.0346 ***	0.0417 ***	-0.0381 ***	0.0933 ***	0.0712 ***	0.0697 ***	0.0595 ***	0.2385 ***	1		
MTBVE	0.0199 **	0.0343 ***	0.0409 ***	-0.1552 ***	-0.0993 ***	-0.0725 ***	-0.0381 **	-	-0.0348 ***	1	
NIBE_TA	-0.2313 ***	-0.2276 ***	-0.1863 ***	-0.1288 ***	-0.0135	-0.0093	0.024	0.2635 ***	-0.1113 ***	0.0577 ***	1

Asterisks *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table 4: Regression Results-AEM

	ABS_ DA_J	POSITIVE_ DA_J	NEGATIVE_ DA_J	ABS_ DA_MJ	POSITIVE_ DA_MJ	NEGATIVE_ DA_MJ
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
SOS_ENV_ SCORE	-0.0002196 (-3.52) ***	-0.0001567 (-1.78) *	-0.0002586 (-3.01) ***	-0.0002044 (-3.29) ***	-0.0001277 (-1.5)	-0.0002522 (-2.87) ***
GOV_ SCORE	0.0000192 (0.44)	0.0000714 (1.3)	-0.0000263 (-0.40)	0.0000116 (0.27)	0.0000635 (1.16)	-0.0000435 (-0.66)
CSR_ REPORTING	-0.0028618 (-0.80)	-0.0036227 (-0.76)	-0.0019225 (-0.37)	-0.0033427 (-0.93)	-0.0039405 (-0.85)	-0.0035238 (-0.67)
SIZE	-0.0060640 (-6.80) ***	-0.0083576 (-6.67) ***	-0.0036706 (-3.01) ***	-0.0060628 (-6.74) ***	-0.0087107 (-7.01) ***	-0.0032041 (-2.61) ***
LEV	0.0160192 (1.80) *	0.0584901 (4.36) ***	-0.0203616 (-1.78) *	0.0147431 (1.65) *	0.0542539 (4.13) ***	-0.0206990 (-1.77) *
NIBE_TA	-0.0912894 (-3.60) ***	-0.0035746 (-0.08)	-0.1447640 (-4.65) ***	-0.0923552 (-3.62) ***	-0.0056572 (-0.12)	-0.1435515 (-4.65) ***
MTBVE	0.0007724 (1.36)	-0.0003851 (-0.46)	0.0015757 (2.12) **	0.0005719 (1.04)	-0.0003290 (-0.38)	0.0011770 (1.67) *
Constant	0.1633120 (12.67) ***	0.1812313 (10.12) ***	0.1383830 (7.73) ***	0.1642032 (12.64) ***	0.1864057 (10.39) ***	0.1345295 (7.48) ***
Year-fixed effects	No	No	No	No	No	No
Observations	5,137	2,581	2,556	5,137	2,598	2,539
F-statistic	24.97	17.71	11.33	24.65	17.77	10.90
R-squared	0.0546	0.0639	0.00702	0.06588	0.06193	0.0672

*Asterisks *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.*

Table 5: Regression Results-AEM-ROA Adjusted

	ABS_ DA_J_ ROA	POSITIVE _DA_J_ ROA	NEGATIVE _DA_J_ ROA	ABS_ DA_MJ_ ROA	POSITIVE _DA_MJ_ ROA	NEGATIVE _DA_MJ_ ROA
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
SOS_ENV_ SCORE	-0.0002271 (-3.58) ***	-0.0001946 (-2.13) **	-0.00026040 (-3.08) ***	-0.0002072 (-3.23) ***	-0.0001566 (-1.73) *	-0.00024220 (-2.83) ***
GOV_ SCORE	0.0000396 (0.89)	0.0000909 (1.52)	-0.00000484 (-0.08)	0.0000209 (0.47)	0.0000592 (0.99)	-0.00000891 (-0.14)
CSR_ REPORTING	-0.0057367 (-1.58)	-0.0048206 (-0.96)	-0.00514870 (-1.04)	-0.0055614 (-1.52)	-0.0059048 (-1.19)	-0.00470880 (-0.94)
SIZE	-0.0058733 (-6.77) ***	-0.0082478 (-6.64) ***	-0.00357660 (-3.07) ***	-0.0059511 (-6.8) ***	-0.0078563 (-6.35) ***	-0.00410190 (-3.52) ***
LEV	0.0132947 (1.47)	0.052355 (3.82) ***	-0.01948780 (-1.78) *	0.0128622 (1.42)	0.0492229 (3.65) ***	-0.01873730 (-1.70) *
NIBE_TA	-0.0850579 (-3.34) ***	-0.0799977 (-2.11) **	-0.08131850 (-2.80) ***	-0.0843993 (-3.32) ***	-0.0895841 (-2.42) **	-0.07081610 (-2.56) **
MTBVE	0.0014811 (2.67) ***	-0.0001788 (-0.22)	0.00226010 (3.37) ***	0.0014370 (2.6) ***	-0.0001097 (-0.13)	0.00211230 (3.23) ***
Constant	0.1623630 (12.93) ***	0.1855982 (10.55) ***	0.13705590 (7.96) ***	0.1634996 (12.94) ***	0.1803025 (10.28) ***	0.14418960 (8.42) ***
Year-fixed effects	No	No	No	No	No	No
Observations	5,137	2,386	2,751	5,137	2,382	2,755
F-statistic	27.37	19.25	12.42	26.93	17.87	12.96
R-squared	0.0570	0.0854	0.0508	0.0553	0.06303	0.06611

Asterisks *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table 6: Regression Results - Accounting Quality via Accrual Quality model

	ABS_AQ_ DD Coefficient (t-stat)	ABS_AQ_ M_DD Coefficient (t-stat)	ABS_AQ_ DD Coefficient (t-stat)	ABS_AQ_ M_DD Coefficient (t-stat)
SOS_ENV_SCORE	-0.0001665 (-4.05) ***	-0.0001548 (-3.63) ***	-0.0001589 (-3.72) ***	-0.0001442 (-3.26) ***
GOV_SCORE	-0.0000570 (-1.89) *	-0.0000258 (-0.86)		
CEO_CHAIR_SEP			-0.0003627 (-0.28)	-0.0006484 (-0.50)
IND_BOARD_MEMB			-0.0001784 (-0.07)	-0.0006928 (-0.27)
POL_BOARD_IND			-0.0028361 (-2.17) **	-0.0028408 (-2.13) **
CSR_ REPORTING	0.0006811 (0.28)	-0.0011353 (-0.45)	0.0002362 (0.09)	-0.0007564 (-0.29)
SIZE	-0.0026322 (-4.10) ***	-0.0028996 (-4.55) ***	-0.0030529 (-4.83) ***	-0.0031650 (-4.96) ***
LEV	-0.0151410 (-2.97) ***	-0.0145708 (-2.88) ***	-0.0139199 (-2.64) ***	-0.0135389 (-2.59) ***
NIBE_TA	-0.0369322 (-2.44) **	-0.0326892 (-2.20) **	-0.0412215 (-2.62) ***	-0.0370845 (-2.39) **
MTBVE	0.0008701 (2.64) ***	0.0010029 (2.87) ***	0.0010919 (3.22) ***	0.0012277 (3.40) ***
Constant	0.0914891 (9.23) ***	0.0966131 (9.72) ***	0.0965305 (9.53) ***	0.1012389 (9.82) ***
Year-fixed effects	Yes	Yes	Yes	Yes
Observa-tions	4,543	4,540	4,307	4,304
F-statistic	10.06	9.46	8.54	8.22
R-squared	0.0587	0.0563	0.0616	0.06

*Asterisks *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.*

Table 7: Regression results with REM

	REM Coefficient (t-stat)	REM Coefficient (t-stat)
SOS_ENV_SCORE	-0.0017441 (-3.61) ***	-0.0015115 (-3.14) ***
GOV_SCORE	0.0000223 (0.08)	
CEO_CHAIR_SEP		-0.0557181 (-3.80) ***
IND_BOARD_MEMB		-0.0355498 (-1.64) *
POL_BOARD_IND		-0.0290910 (-2.24) **
CSR_REPORTING	0.0188070 (0.78)	0.0272751 (1.06)
SIZE	0.0308344 (4.95) ***	0.0319027 (5.02) ***
LEV	0.1162605 (2.00) **	0.1179592 (2.01) **
NIBE_TA	-0.4656902 (-4.07) ***	-0.4513746 (-4.04) ***
MTBVE	-0.0288714 (-7.09) ***	-0.0281060 (-6.94) ***
Constant	-0.4444841 (-4.60) ***	-0.450517 (-4.49) ***
Year-fixed effects	Yes	Yes
Observations	2,095	1,987
F-statistic	10.72	11.93
R-squared	0.1414	0.1542

*Asterisks *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.*

Table 8: Regression Results-Probit model for CSR Reporting

	<i>CSR_</i> <i>REPORTING</i> <i>Coefficient</i> <i>(t-stat)</i>	<i>CSR_</i> <i>REPORTING</i> <i>Coefficient</i> <i>(t-stat)</i>	<i>CSR_</i> <i>REPORTING</i> <i>Coefficient</i> <i>(t-stat)</i>	<i>CSR_</i> <i>REPORTING</i> <i>Coefficient</i> <i>(t-stat)</i>	<i>CSR_</i> <i>REPORTING</i> <i>Coefficient</i> <i>(t-stat)</i>
SOS_ENV_SCORE	0.0552474 (23.83) ***	0.0552472 (23.83) ***	0.0552476 (23.82) ***	0.0552611 (23.82) ***	0.057007 (15.53) ***
GOV_SCORE	0.0052420 (3.39) ***	0.0052451 (3.4) ***	0.0052647 (3.4) ***	0.0052545 (3.4) ***	0.007029 (2.64) ***
ABS_DA_J	-0.4643636 (-1.23)				
ABS_DA_MJ	-0.5632537 (-1.47)				
ABS_DA_J_ROA/	-0.7116133 (-1.97)**				
ABS_DA_MJ_ROA	-0.7222283 (-1.96) **				
REM	0.123376 (0.79)				
SIZE	0.0456759 (1.44)	0.0452245 (1.43)	0.0433329 (1.37)	0.0432849 (1.37)	0.052577 (0.97)
LEV	0.5940323 (3.09) ***	0.5978607 (3.11) ***	0.5978023 (3.11) ***	0.6005711 (3.13) ***	2.191986 (5.42) ***
NIBE_TA	1.5877040 (5.00) ***	1.579814 (4.97) ***	1.571912 (4.95) ***	1.572578 (4.95) ***	2.317457 (5.11) ***
MTBVE	0.0175570 (1.39)	0.0175277 (1.39)	0.018444 (1.46)	0.0184137 (1.46)	-0.04223 (-1.89) *
Constant	-3.850525 (-7.24) ***	-3.838374 (-7.22) ***	-3.801174 (-7.16) ***	-3.801115 (-7.16) ***	-3.42471 (-3.92) ***
Year-fixed effects	Yes				
Observations	5,137				
Wald chi2	804.24				
Pseudo R2	0.5585				

Asterisks *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

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Appendix

Appendix A: Eurozone Countries 2021

Serial Number	Country Name
1	Austria
2	Belgium
3	Cyprus
4	Estonia
5	Finland
6	France
7	Germany
8	Greece
9	Ireland
10	Italy
11	Latvia
12	Lithuania
13	Luxemburg
14	Malta
15	The Netherlands
16	Portugal
17	Slovakia
18	Slovenia
19	Spain

Appendix B: Description of variables used in the empirical research of the thesis

Name (Symbol)	Type	Description
Sic Code 1 (WC07021)	Worldscope	SIC CODES were developed by the U.S. government to provide a standard industry classification that covers all the economic activities of the United States. These SIC codes are assigned to both U.S. and non-U.S. companies according to the type of business in which they are engaged. A company may have up to eight SIC codes assigned to it or as little as one depending on the number of business segments that make up the company's revenue. If a sales breakdown for segments is available SIC Code 1 would represent the business segment which provided the most revenue. SIC Code 8 would represent the segment that provided the least revenue. If a sales breakdown is not available, the SIC Code is assigned according to the best judgement of Worldscope.

Accounting Standards Followed (WC007536)	Worldscope	
Total Assets (WC02999)	Worldscope	Represent the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.
Current Assets Total (WC02201)	Worldscope	Represents cash and other assets that are reasonably expected to be realized in cash, sold or consumed within one year or one operating cycle.
Cash & Short-Term Investments (WC02001)	Worldscope	Represents the sum of cash and short-term investments.
Current Liabilities Total (WC03101)	Worldscope	Represent debt or other obligations that the company expects to satisfy within one year.
Depreciation, Depletion & Amortization Cash Flow (WC04051)	Worldscope	DEPRECIATION represents the process of allocating the cost of a depreciable asset to the accounting periods covered during its expected useful life to a business. DEPLETION refers to cost allocation for natural resources such as oil and mineral deposits. AMORTIZATION relates to cost allocation for intangible assets such as patents and leasehold improvements, trademarks, book plates, tools & film costs.
Net Sales Or Revenues (WC01001)	Worldscope	Represent gross sales and other operating revenue less discounts, returns and allowances.
Property, Plant And Equipment Net (WC02501)	Worldscope	Represents Gross Property, Plant and Equipment less accumulated reserves for depreciation, depletion and amortization.
Receivables (Net) (WC02051)	Worldscope	Represent the amounts due to the company resulting from the sale of goods and services on credit to customers (after applicable reserves). These assets should reasonably be expected to be collected within a year or within the normal operating cycle of a business.

Net Income Before Extra Items/Preferred Dividends (WC01551)	Worldscope	Represents income before extraordinary items and preferred and common dividends, but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings.
Funds From Operations (WC04201)	Worldscope	Represents the sum of net income and all non-cash charges or credits. It is the cash flow of the company.
Funds From/For Other Operating Activities (WC04831)	Worldscope	Represent the net change in working capital apart from the increase/decrease in short term borrowings and increase/decrease in cash & equivalents.
Cost Of Goods Sold (Excl Depreciation) (WC01051)	Worldscope	<p>For manufacturing companies, cost of goods sold represents specific or direct manufacturing cost of material and labor entering in the production of finished goods.</p> <p>For merchandize companies, cost of goods sold represents the purchase price of items sold, as well as indirect overhead such as freight, inspecting, and warehouse costs. If a breakdown of total operating cost of non-manufacturing companies is not available, then it is treated as cost of goods sold.</p> <p>For Utilities and Service Organizations, if there is no clear breakdown between cost of goods sold and Selling, General and Administrative Expenses, the total amount is updated to Cost of Goods Sold and noted that Selling General and Administrative Expenses are included.</p>
Inventories Total (WC02101)	Worldscope	Represent tangible items or merchandise net of advances and obsolescence acquired for either (1) resale directly or (2) included in the production of finished goods manufactured for sale in the normal course of operation. In manufacturing companies this item is classified as follows (depending upon the stage of completion in the manufacturing process): finished goods, work in process, raw materials and supplies.
Selling, General & Administrative Expenses (WC01101)	Worldscope	Represents expenses not directly attributable to the production process but relating to selling, general and administrative functions.

Research & Development (WC01201)	Worldscope	Represents all direct and indirect costs related to the creation and development of new processes, techniques, applications and products with commercial possibilities.
Long Term Debt (WC03251)	Worldscope	Represents all interest-bearing financial obligations, excluding amounts due within one year. It is shown net of premium or discount.
Market To Book Value (MTBV)	Datastream	Market to book value of equity
Environment Pillar Score (ENSCORE)	ASSET4 ESG	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.
Governance Pillar Score (CGSCORE)	ASSET4 ESG	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.
Social Pillar Score (SOSCORE)	ASSET4 ESG	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.
CSR Sustainability Reporting (CGVSDP026)	ASSET4 ESG	Does the company publish a separate sustainability report or publish a section in its annual report on sustainability?
CEO-Chairman Separation (CGBSO09V)	ASSET4 ESG	Does the CEO simultaneously chair the board or has the chairman of the board been the CEO of the company?

Independent Board Members (CGBSO07V)	ASSET4 ESG	Percentage of independent board members as reported by the company.
Policy Board Independence (CGBSDP0012)	ASSET4 ESG	Does the company have a policy regarding the independence of its board?