



UNIVERSITY OF PIRAEUS
DEPARTMENT: BANKING & FINANCIAL MANAGEMENT
MASTER OF SCIENCE IN BANKING & FINANCE
SPECIALIZATION: BANKING & FINANCIAL MANAGEMENT

MASTER THESIS

**INTEGRATED REPORTING: CORPORATE GOVERNANCE FACTORS
AFFECTING FIRMS' DECISION FOR VOLUNTARY ADOPTION AND THE
IMPACT OF THIS ADOPTION ON MARKET VALUE**

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PIRAEUS, GREECE – JANUARY 2023

ΕΥΧΑΡΙΣΤΙΕΣ

Για την εκπόνηση της παρούσας διπλωματικής εργασίας θα ήθελα να εκφράσω τις θερμές ευχαριστίες μου προς την επιβλέπουσα καθηγήτρια μου, κα. Αναγνωστοπούλου Σεραΐνα, για την πάντα άμεση ανταπόκρισή της, την πολύτιμη καθοδήγησή της, τις πολύ χρήσιμες συμβουλές κι επισημάνσεις της, όπως και για την εμπιστοσύνη που μου έδειξε από την αρχή μέχρι και την ολοκλήρωση της διατριβής μου.

Θα ήθελα, ακόμη, να ευχαριστήσω ιδιαίτερα την οικογένειά μου για τη στήριξή τους σε ολόκληρη την πορεία μου μέχρι σήμερα και την ακλόνητη πίστη τους σε εμένα και τις δυνατότητές μου.

Τέλος, θα ήθελα να ευχαριστήσω τον Χάρη που με στηρίζει και δείχνει κατανόηση κι υπομονή.

ABSTRACT

Integrated Reporting (<IR>) is an emerging phenomenon having attracted the interest of both the academic literature and business world during the last few decades. <IR> introduces the concept of a complete report including both financial and sustainability information. Its objective is to provide a holistic view of enterprises to all interested parties, especially to capital providers, demonstrating the linkages of such information to business vision, long-term targets, strategy and business model and highlighting the way in which companies create or/and sustain value over time. The application of <IR> is mandatory for the jurisdiction of South Africa for all entities listed on the Johannesburg Stock Exchange, whereas its adoption is optional anywhere else around the globe.

The purpose of the current thesis is to examine the association between the level of corporate governance quality within organizations and their decision for adopting the integrated reporting approach voluntarily as well as to examine the relationship between voluntary integrated reporting adoption and market valuation through the use of the accounting-based valuation model of Ohlson (1995).

Our empirical analysis focuses on a sample of firms based in Eurozone, where the regime about the application of integrated reporting is voluntary. Eurozone was selected due to the fact that the vast majority of the existing literature when analyzing voluntary adoption of <IR>, even sparse, examines international samples (Hsiao et al., 2019; Obeng et al, 2021) despite the fact that a large number of companies following <IR> is based in Eurozone countries. Our empirical research covers years 2007-2021, even though the concept of <IR> expanded rapidly since 2005 (White, 2005; Todd, 2005). The first two years of <IR> spread (years 2005-2006) are left out of our sample to ensure results will be more representative of the actual relationships. For the conduction of our empirical research, we used annual data retrieved from Worldscope, Datastream and ESG databases of Refinitiv.

Our findings indicate that firms with stronger corporate governance systems are more likely to practice integrated reporting in line with previous studies (Frías-Aceituno et al., 2013; Stacchezzini et al., 2016; Fasan & Mio, 2017; Vitolla et al., 2020). Additionally, our results show that implementation of integrated reporting is positively valued by capital market participants, which is reflected through higher market values, corroborating evidence of prior empirical research (Baboukardos & Rimmel, 2016; Lee & Yeo, 2016; Arguelles et al., 2017; Zhou et al., 2017; Barth et al., 2017). Our findings may be useful for standard setters in identifying how firms can be further motivated to adopt integrated reporting through corporate governance and for firms to understand that significant benefits can be obtained from transition to an integrated reporting approach.

Key-words: Integrated Reporting, Corporate Governance, Corporate Social Responsibility, Board of Directors, Market Value, Eurozone, Ohlson model

ΠΕΡΙΛΗΨΗ

Η ενιαία ολοκληρωμένη αναφορά (Integrated Reporting ή <IR>) βρίσκεται στο επίκεντρο των συζητήσεων του ακαδημαϊκού κι επιχειρηματικού κόσμου τις τελευταίες δεκαετίες. Το Integrated Reporting εισάγει την έννοια μιας πλήρους αναφοράς, η οποία συμπεριλαμβάνει τόσο χρηματοοικονομικά στοιχεία όσο και πληροφορίες σχετικά με την εταιρική αειφορία. Στόχος της εν λόγω πρακτικής είναι να παρέχει μια ολοκληρωμένη εικόνα της επιχείρησης προς όλα τα ενδιαφερόμενα μέρη, κυρίως τους επενδυτές, συνδέοντας τα ανωτέρω στοιχεία με το όραμα, τους μακροπρόθεσμους στόχους, τη στρατηγική και το επιχειρηματικό μοντέλο της εταιρείας, και τονίζοντας τον τρόπο με τον οποίο παράγεται ή/και διατηρείται αξία σε βάθος χρόνου. Εκτός από τη χώρα της Νοτίου Αφρικής, όπου η εφαρμογή του <IR> είναι υποχρεωτική για τις εισηγμένες στο Χρηματιστήριο του Γιοχάνεσμπουργκ εταιρείες, το κανονιστικό πλαίσιο είναι προαιρετικό.

Σκοπό της παρούσας διπλωματικής εργασίας αποτελεί η εξέταση της σχέσης μεταξύ του επιπέδου ποιότητας της εταιρικής διακυβέρνησης των επιχειρήσεων και της απόφασής τους για την υιοθέτηση του <IR> υπό προαιρετικό καθεστώς, όπως επίσης και η εξέταση της σχέσης μεταξύ εθελοντικής εφαρμογής του <IR> και της αγοραίας αξίας των εταιριών μέσω του υποδείγματος αποτίμησης Ohlson (1995).

Η παρούσα εμπειρική έρευνα εστιάζει σε ένα δείγμα εταιριών από τις χώρες της Ευρωζώνης, όπου η εφαρμογή του <IR> είναι προαιρετική. Η Ευρωζώνη επιλέχθηκε διότι οι υπάρχουσες εμπειρικές μελέτες σχετικά με την εθελοντική εφαρμογή της ενιαίας ολοκληρωμένης αναφοράς κατά πλειοψηφία χρησιμοποιούν παγκόσμια δείγματα (Hsiao et al., 2019; Obeng et al., 2021) παρά το γεγονός ότι στην Ευρωζώνη υπάρχει μεγάλος αριθμός εταιριών που εφαρμόζουν αυτό το είδος αναφοράς. Ο υπό εξέταση χρονικός ορίζοντας αναφέρεται στα έτη 2007-2021, παρόλο που η έννοια του <IR> διαδόθηκε ραγδαία από το 2005, ώστε τα αποτελέσματα της ανάλυσης μας να είναι περισσότερο αντιπροσωπευτικά των πραγματικών σχέσεων. Για την έρευνα χρησιμοποιήθηκαν δεδομένα από τις βάσεις δεδομένων Worldscope, Datastream (λογιστικά στοιχεία) και ESG (στοιχεία για την εταιρική αειφορία) της Refinitiv.

Τα ευρήματα της έρευνας υποδεικνύουν ότι εταιρίες με ισχυρό σύστημα εταιρικής διακυβέρνησης είναι πιθανότερο να υιοθετήσουν το <IR> συγκλίνοντας με τα αποτελέσματα προηγούμενων ερευνών (Frías-Aceituno et al., 2013; Stacchezzini et al., 2016; Fasan & Mio, 2017; Vitolla et al., 2020). Επιπρόσθετα, τα αποτελέσματα δείχνουν ότι η εφαρμογή του <IR> αποτιμάται θετικά από τις αγορές, γεγονός το οποίο αντικατοπτρίζεται μέσω υψηλότερων αγοραίων αξιών, επιβεβαιώνοντας παλαιότερα εμπειρικά ευρήματα (Baboukardos & Rimmel, 2016; Lee & Yeo, 2016; Arguelles et al., 2017; Zhou et al., 2017; Barth et al., 2017). Τα ευρήματα μας ίσως είναι χρήσιμα τόσο για τις Αρχές ώστε να αναγνωρίσουν νέους τρόπους προώθησης του <IR> μέσω της εταιρικής διακυβέρνησης όσο και για τις ίδιες τις εταιρίες προκειμένου να αντιληφθούν ότι μπορούν να αποκομίσουν σημαντικά οφέλη μεταβαίνοντας στη χρήση της ενιαίας ολοκληρωμένης αναφοράς.

Λέξεις-Κλειδιά: Ενιαία Ολοκληρωμένη Αναφορά, Εταιρική Διακυβέρνηση, Εταιρική Κοινωνική Ευθύνη, Διοικητικό Συμβούλιο, Αγοραία Αξία, Ευρωζώνη, Υπόδειγμα Ohlson

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1. Introduction

Integrated reporting (<IR>) represents the most innovative reporting approach until today, stands at the forefront of corporate disclosure practices, and is gaining more and more traction on a worldwide scale. Integrated reports combine both financial and non-financial information into a single report with the purpose to provide a holistic view of an organization's strategy, business model, risk and opportunities management, governance, and performance and communicate its ability to create or/and sustain value over time (IIRC, 2013). The growing interest of the accounting and finance literature as well as of the business world about this novel concept of corporate reporting in the last few decades incentivized us to focus on examination of integrated reporting in the context of the current dissertation.

More specifically, we will attempt to respond to two questions related to the integrated reporting approach. First of all, we will examine whether the positive association between corporate governance and the voluntary adoption of integrated reporting found to be valid at an international level (Frias-Aceituno et al., 2012; Melloni et al., 2015; Lai et al., 2016; Lai et al., 2020; Marrone, 2020; Vitolla et al., 2020) applies also to firms based on the Eurozone countries using a sample for the years 2007-2021. Secondly, for <IR> adopting firms of Eurozone during the same time period we will attempt to identify in what way voluntary adoption of this new reporting approach is related to firm market valuation contributing to the existing bibliography (Zhou et al., 2017; Lee & Yeo, 2016; Barth et al., 2017; Arguelles et al., 2017; Obeng et al., 2021) and broadening the geographical scope of <IR> evidence.

The decision to focus our empirical research on voluntary setting of integrated reporting is attributed to three main reasons. First of all, existing empirical research in voluntary regulatory environment is limited (Arguelles et al., 2017; Wu & Zhou, 2021), since the vast majority of prior studies (Baboukardos & Rimmel, 2016; Lee & Yeo, 2016; Zhou et al., 2017; Barth et al., 2017) has analyzed the implications of using <IR> in South Africa, where it is mandatory. Secondly, reporting incentives can differ between mandatory and optional regimes resulting in different capital market consequences (Obeng et al., 2021 summarizing Leuz & Wysocki, 2016; Christensen et al., 2015). Thirdly, the sparse empirical studies examining the application of <IR> voluntarily use international samples (Serafeim, 2015; Obeng et al., 2021) and only a few refer to the European continent (Alfiero et al., 2017), where a significant number of firms releasing integrated reports operates. Therefore, we found it useful to perform our analysis using a sample of firms located in Eurozone countries.

Regarding the time period under examination, we selected to base our sample on years 2007-2021 due to the following. Past literature provided indications that <IR> spread

widely among corporations since 2005 (White, 2005; Todd, 2005). However, we left out of our sample years 2005-2006 to ensure that results will be more representative of the actual relationships under examination. The ending year of 2021 was the last year for which available data existed and we selected to use it in order to obtain sufficient data and reach appropriate conclusions.

Following Serafeim (2015), Obeng et al. (2021), and Wu and Zhou (2021), we identify the integrated reporting adopting firms of the Eurozone using a proxy item provided by ESG Refinitiv database. This proxy item indicates corporations that practice integrated reporting after considering the extent to which they follow an integrated strategy of reporting financial and sustainability-related information in the management discussion and analysis (MD&A) section, the business summary analysis and the business review into their annual reports. For examining the association between corporate governance quality and adoption of the integrated reporting approach voluntarily, we define two research models and we estimate them through probit regression models. In the first research model, we measure the quality of corporate governance in corporations employing three individual board characteristic proxies: board size, board independence and board gender diversity consistently with the existing literature (García-Sánchez et al., 2011; Frías-Aceituno et al., 2012; Fasan & Mio, 2017; Vitolla et al., 2020). In the second research model, we measure the quality of the overall system of corporate governance of firms using an overall governance score provided by ESG Refinitiv Database. This score measures the overall effectiveness of corporations' systems and processes, which ensure that board members and executive directors act in favor of long-term shareholders. Based on previous studies additional measures related to adoption of integrated reporting, such as the existence of Audit Committees (Ahmed Haji & Anifowose, 2016; Velte, 2018), the experience of practicing Corporate Social Responsibility Reporting (Sierra-García et al., 2015; Lueg et al., 2016), firms' commitment to serving environmental and social concerns through their operation and other company-characteristics such as firm size, profitability, leverage, growth prospects, and liquidity (Baboukardos & Rimmel, 2016; Lopes et al., 2018; Caglio et al., 2019; Hsiao et al., 2019) were included in our models as control variables alongside with industry and time fixed effects.

Concerning the second point under examination, namely the relationship between the voluntary adoption of integrated reporting and market valuation, we employ a restated version of the accounting-based valuation model of Ohlson (1995), which is widely known in literature for linking both accounting and non-accounting information to firms' market valuation. For the measurement of market valuation following previous studies (Hassel et al., 2005; Mervelskemper and Streit, 2017; Landau et al., 2020), we use the cum-dividend adjusted market value scaled by the opening book value of equity. As independent variables we use net income scaled by the opening book value of equity and the proxy of integrated reporting adoption as previously explained. To correct for any self-selection issues and

bias, in the course of estimating the aforementioned model, we utilize a statistical tool, known as “a Heckman two-stage approach”. Industry and year fixed effects are also applied in line with most of the previous studies (Frías-Aceituno et al., 2014; Baboukardos & Rimmel, 2016; Bernardi & Stark, 2018; Obeng et al., 2021).

Our sample consists of 6,510 firm-year observations for 434 individual firms incorporated in 13 Eurozone countries and operating in 40 different industry sectors. For the final regressions in examining the association between corporate governance quality and voluntary adoption of the integrated reporting approach, 2,092 and 2,064 firm-year observations were used under the first and the second research model respectively. For the final regressions in examining the association between voluntary implementation of IR and market valuation 2,092 firm-year observations were used. Data used were retrieved from Worldscope, Datastream and ESG databases of Refinitiv.

Our results indicate that for Eurozone organizations, for which voluntary setting of <IR> applies, corporate governance mechanism is positively connected to their decision for practicing integrated reporting, with the statistically significant and positive link being consistent for the board size and independence proxies. Such evidence is in alignment with our expectations and previous studies (Frías-Aceituno et al., 2013; Meniaoui et al., 2016; Stacchezzini et al., 2016; Alfiero et al., 2017; Fasan & Mio, 2017; Zambon et al., 2019; Vitolla et al., 2020). Notable is the statistically significant negative association indicated between board gender diversity and adoption of <IR>, opposed to our expectations and the vast majority of empirical research (Frías-Aceituno et al., 2012; Alfiero et al., 2017; Girella et al., 2019; Vitolla et al., 2020). Furthermore, CSR reporting practice as well as environmental and social performance are found to have a statistically significant positive impact on preparing integrated reports voluntarily confirming the findings of previous researchers (Frías-Aceituno et al., 2014; Amami & Maalez, 2015) and our choice to include relevant proxies as controls. Finally, concerning market valuation, our results highlight that integrated reporting is valued positively by capital markets, which in fact is reflected through higher market values, in line with our expectations and the empirical findings of the largest part of previous studies (Baboukardos & Rimmel, 2016; Lee & Yeo, 2016; Arguelles et al., 2017; Mervelskemper & Streit, 2017; Zhou et al., 2017; Barth et al., 2017).

We believe that our study provides some useful insights. It contributes to obtaining a deeper understanding of how corporate governance affects firms' choice to follow an integrated reporting approach, which may be helpful for standard setters in identifying new ways to further promote the integrated reporting practice among businesses. Moreover, our study provides evidence that positive market implications found to arise from applying <IR> under mandatory reporting regimes are also valid for the voluntary reporting regime of the Eurozone. This may convince companies to view a transition to this reporting type more positively.

The remainder of this study is structured as follows. The second section provides background information and review of the relevant literature on integrated reporting. It also states the hypotheses being examined in the following sections of the current dissertation. The third section describes the sample selection process, the measurement of selected dependent, independent and control variables, and the construction of the research models. The fourth section presents our empirical analysis including descriptive statistics and regression results, discusses the findings and provides some possible explanations. The fifth and last section presents the respective implications and concludes.

2. Literature Review & Hypotheses Development

2.1 Integrated Reporting

2.1.1 Background information and Definitions

The objective of Financial Reporting is to disclose useful information to the public, especially capital providers, enabling efficient decision-making about investments, credit and similar resource allocation (FASB, 2008; IASB, 2008a). Traditional financial reporting provides financial-related information over certain time periods (i.e. on a quarterly or annual basis) based on historical data through the issuance of the financial statements. Over time, several inadequacies of this type of reporting have been acknowledged by academics (e.g., Francis & Schipper, 1999; Core et al, 2003) and practitioners (e.g., KPMG, 2016). Since the early 2000s traditional financial reporting's failure to capture the economic implications of business innovations and economic changes in a timely manner was identified (Healy and Palepu 2001). Inadequacies were more severe in firms with high organizational complexity such as high intangible assets and multinational firms with diverse business and geographic operations (Aboody and Lev 2000; Bushman et al. 2004; Coles et al. 2008).

In addition to the above, the numerous accounting scandals (i.e. Enron, Parmalat, Lehman Brothers Holding Inc. etc.), the various sustainability challenges and the 2008 global financial crisis, raised more doubts about the fairness of corporations' financial disclosures and made traditional reports less value relevant for investors (Eccles & Krzus, 2010). The necessity for reports to demonstrate a higher level of transparency and accountability as well as include except for financial information also information related to environmental, societal and governance (ESG) issues was highlighted. In order for corporations to respond to the increasing information needs of the public and address the weaknesses of the traditional financial reporting, several reporting approaches were introduced leading eventually to the rise of integrated reporting. It is suggested that the origins of the integrated reporting concept can be traced back to the mid-1990s (Eccles & Serafeim, 2011). According to bibliography, three main reporting frameworks preceded the

introduction of integrated reporting: the Balanced Scorecard (Kaplan & Norton, 1992), the Triple Bottom Line (Elkington, 1997) and the Sustainability Reporting (Milne et al., 2009; Buhr et al., 2014).

The Balanced Scorecard referred to an internal mechanism focusing on performance measurement, reporting and management control of both financial and non-financial strategic measures (Kaplan and Norton, 1996). However, it was unlikely to provide any form of integration between financial and non-financial measures (De Villiers et al., 2014). The “Triple Bottom Line” (TBL) suggested that corporations should focus on three equal dimensions, namely profit, people and planet, when setting goals and making decisions (Pope et al., 2004). Concerning sustainability reporting, it referred to disclosure of information demonstrating firms’ capabilities to develop themselves in a sustainable manner satisfying the needs of present generations and simultaneously ensuring that also future generations will have the resources to meet their own needs (United Nations General Assembly, 1987). The aforementioned tools were not able to harmonize the various sources of corporate reporting and thus, failed to convey a complete view of corporations’ performance (Vitolla et al., 2019). However, these tools cultivated the mindset that businesses are accountable except for their financial performance, also for their impact on society and natural environment setting the foundations for Integrated Reporting.

“Novozymes”, a Danish company, was the first firm to integrate extra-financial information into its annual report in 2002 (Eccles & Serafeim, 2011). Other companies proceeded gradually to release of similar reports revealing the rise of a new reporting type, even though they were not labeled as integrated reports during these early years of use. Up to 2005 preparation of such reports became increasingly widespread among institutions indicating that transition to this innovative reporting approach would constitute common business practice in the future (White, 2005; Todd, 2005).

In 2010, the Prince’s Accounting for Sustainability Project (A4S) and the Global Reporting Initiative (GRI) proceeded to foundation of the International Integrated Reporting Committee, which was later renamed to International Integrated Reporting Council (IIRC). The IIRC is a “global coalition of regulators, investors, companies, standard setters, the accounting profession and non-governmental organizations” (IIRC, 2011). Its objective was to establish a new reporting approach, known as integrated reporting, as the norm across business world. The IIRC (2011) defined Integrated Reporting as the process through which a broader explanation of performance is communicated to the public making visible organizations’ use of and dependence on different resources and relationships and their access and impact on them. To facilitate familiarization with the new reporting principles of <IR>, the IIRC launched in late 2011 the first Pilot Program, that consisted of the Business Network and the Investor Network. The Program was addressed to companies willing to become early-adopters of integrated reporting. In 2013, the IIRC released the International

Integrated Reporting Framework, which is principle-based, in order to further accelerate transition from conventional to integrated reporting and provide some guidance on application of <IR>. A short presentation of the main elements of <IR> introduced through the <IR> Framework follows.

The process of integrated reporting results in a periodic integrated report, which is defined as “*a concise communication about how an organization’s strategy, governance, performance, and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term*” (IIRC, 2013). Therefore, dissemination of financial and non-financial information through integrated reports is assumed to provide a holistic view of firms’ business model, risks and opportunities management including action measures, and the internal processes resulting in value creation and/or value sustainability over time. Such information can be valuable to external providers of financial capital i.e. existing or potential equity and debtholders, who are declared by the IIRC (2013) as the main audience of integrated reports. Besides those, however, information content of integrated reports has proven beneficial to the remaining interested parties of corporations including employees, business partners, local communities, regulators etc., since it provides them a deeper understanding of firms’ growth strategy and future prospects (Simnett et al., 2015; Mio et al., 2016; De Graaf & Steens, 2019).

The International <IR> Framework manifests that integrated reporting is founded on the concept of integrated thinking, which is defined as “*the active consideration by an organization of the relationships between its various operating and functional units and the capitals that the organization uses or affects*” (IIRC, 2013). The idea of integrated thinking suggests that a managerial revolution within organizations is a necessary condition so that integrated reporting will be successfully pursued (Busco et al., 2013; Stubbs & Higgins, 2014; Thomson, 2015). Integrated thinking is expected to help corporations improve decision-making processes through better consideration of the relationships between organizations’ various departments, deeper comprehension of facing challenges overall, and improved communication after breaking down any “silos”. This way corporations have increased potential to prosper over the long term in a manner beneficial to both shareholders and society (Eccles et al., 2015).

It is worthwhile to note that the International <IR> Framework proposes some guiding principles and content elements that could be applied during the preparation of integrated reports, but it does not require those to be followed on a mandatory basis. Organizations have a high level of flexibility and discretion about integrated reports’ structure and information content, which makes comparability difficult. The guiding principles underpinning integrated reports relate to organizations’ strategic focus, future orientation, stakeholders’ relationships and their impact on the value-creation process as well as to connectivity, materiality, conciseness, reliability, completeness, consistency and

comparability of disclosed information (IIRC, 2013). Serafeim (2015) found that the principles of connectivity i.e. relationship among key elements included in the report are explicitly and clearly presented and articulated (IIRC, 2013a) and materiality i.e. disclosure only of substantial matters affecting value-creation ability (IIRC, 2013a) are the two key characteristics driving the relationship between <IR> and investors base. Concerning the content elements, they refer to firms' organizational review, external environment, governance structure, business model, risks and opportunities, strategy and resource allocation, performance and outlook and the way these are linked to each other contributing to the value-creation process (IIRC, 2013). In addition to the aforementioned, the <IR> Framework has identified six categories of capitals i.e., financial, manufactured, intellectual, human, social & relationship and natural, which serve as benchmarks based on a fundamental assumption that each one of these represents an input in an organization's business model through which it is transformed into value.

Integrated reporting aims to foster a more cohesive approach to corporate reporting by placing emphasis on the interconnections of different types of information previously reported in separate strands as disconnected (Eccles & Serafeim, 2011; Cho et al., 2013; Middleton, 2015) and by providing insights about the resources used in terms of the aforementioned six capitals. Due to the introduction of integrated thinking and capitals' concepts, the integrated reporting constitutes, in fact, a novel theory of enterprise (Paolucci & Cerioni, 2017).

At this point, it should be mentioned that the <IR> Framework does not provide protocols for execution of assurance engagements over integrated reports (IIRC, 2013b), causing the concern of academic and business cycles. Many researchers claim that assurance by an independent third-party can play a leading role in the successful development of integrated reporting as a broadly accepted and trusted reporting concept (Eccles & Saltzman, 2011; Cheng et al., 2014; Flower, 2015).

After extensive consultation with capital market participants, preparers and users of integrated reports in various jurisdictions and consideration of any issues that arose throughout the previous years, the International Integrated Reporting Framework was revised in 2021 maintaining its original concept and principles (IIRC, 2021).

2.1.2 Regulatory Environment

Adoption of integrated reporting is voluntary at a global level except for the jurisdiction of South Africa, where it is mandated by the King III Report and constitutes a listing requirement for the Johannesburg Stock Exchange (JSE). This mandatory setting was imposed by the South African King Committee in 2010 and it has been, thereafter, in effect on an "apply or explain" basis mandating all public companies based in South Africa to

either prepare and issue an integrated annual report or, otherwise, explain the reasons for non-compliance. Within 2011, the first year of application of the King III Report, almost 50% of public entities on JSE had issued an integrated report in compliance with the aforementioned requirement (Deloitte, 2012). Up to 2014, when the Integrated Reporting Committee (IRC) of South Africa declared its support to the International Integrated Reporting Framework as suitable also for South African companies, the IRC of South Africa was issuing its own guidelines to facilitate transition to this new type of reporting.

In favor of the adoption of Integrated Reporting in European continent has contributed the European Union (EU) Directive, also called non-financial reporting directive (NFRD 2014/95/EU), issued in 2014. NFRD required large public-interest enterprises across EU with more than 500 employees during a financial year to disclose both non-financial and diversity information related to their financial performance, financial position, environmental, social and employee matters, business model etc. The directive became effective within 2018 and applied to almost 11,700 firms. The Chief Executive Officer of IIRC, Richard Howitt (2016) punctuated that NFRD is considered a “stepping stone” to integrated reporting. In 2021 the Corporate Sustainability Reporting Directive (CSRD), which sets a stricter regulation concerning sustainability reporting disclosures and covers a broader set of listed entities including large and small-medium sized companies, was approved for replacing NFRD. The first set of standards have already been issued and the new directive will become in effect for the first time in fiscal year 2024, for reports published in 2025. It is anticipated that this development will further foster the global acceptance of integrated reporting as the main business practice fulfilling the mission of the IIRC.

In the United Kingdom, the Strategic Reporting mandate promotes similar disclosures content and quality as of integrated reporting (FRC, 2017). In the United States, the Securities and Exchange Commission (SEC) has developed a regulatory platform that encourages objectivity and integrity and focuses on long-term capital market consequences of firms’ decisions, which facilitate alignment with the principles of integrated reporting (Laux, 2018). Finally, Japan has fostered the spread of integrated reporting through initiatives by government and financial regulators as well as its stock exchanges (Wang et al., 2020).

It is evident from the aforementioned, that integrated reporting is at the center of interest by standard setters, regulators and capital market authorities worldwide. Therefore, despite integrated reporting’s voluntary nature more and more stock exchanges including those of Sao Paulo, Singapore, Kuala Lumpur, and Copenhagen are calling for a “report or explain” requirement regarding disclosure of financial and ESG information in a balanced and integrated report (Zhou et al., 2017). Furthermore, the IIRC has engaged with prestigious bodies such as the International Accounting Standards Board (IASB) and the U.S. Financial

Accounting Standards Board (FASB) in considering new disclosure models (Barth et al., 2017).

2.2 Research evidence from practicing Integrated Reporting

Most studies on integrated reporting are qualitative based on theoretical investigations (i.e. Eccles & Krzus, 2010; Adams 2013), case studies (i.e. Eccles & Serafeim, 2014) or surveys (i.e. KPMG, 2012). Only a few empirical researches analyze the determinants of integrated reporting adoption (i.e. García-Sánchez et al., 2013; Frias-Aceituno et al., 2014; Lai et al., 2016; Vitolla et al, 2020a; Vitolla et al, 2020b), whereas some others examine the impact of the integrated reporting approach on firm valuation under both the mandatory and voluntary reporting regime of <IR> (Churet & Eccles, 2014; Baboukardos & Rimmel, 2016; Lee & Yeo; 2016; Barth et al., 2017; Obeng et al., 2021).

2.2.1 Benefits and Drawbacks

According to the existing theoretical bibliography, several benefits are claimed to arise from adoption of <IR> providing further motivation to corporations for using integrated reports. Eccles and Saltzman (2011) distinguish such benefits into three categories: internal benefits affecting managerial decisions and stakeholders' relationships and engagement, external benefits linked to satisfaction of investors' information demands and benefits linked to reduction of regulatory risks. The latter is stated in the sense that firms practicing <IR> are prepared to provide additional information in case it is required by regulators. Similarly, De Graaff and Steens (2019) classified <IR> benefits into interaction and performance benefits in correspondence with the aforementioned two first categories.

Regarding the internal or interaction benefits as mentioned above, Simnett et al. (2015) and Mio et al. (2016) highlighted that through integrated reporting, firms' vision and value creation processes are clearly communicated to diverse stakeholder groups including employees. In this way, staff better understands its role towards the achievement of firm's primary goal, its awareness is raised and its involvement and commitment is increased. Another important benefit of this category relates to enhancement of corporate reputation and public image (Steyn, 2014), since corporations that use integrated reports are perceived as more transparent caring about the information needs of various stakeholder teams. This, in turn, can lead to higher stakeholder engagement and increased satisfaction (Mio et al., 2016; Steyn, 2014). In addition to the above, adoption of <IR> can be used by organizations as a mechanism to signal to capital providers and potential customers the areas in which they differ from competitors being, even, superior (Lodhia, 2015).

Concerning the external or performance benefits, practicing <IR> accelerates integrated thinking within organizations leading to improvement of decision-making processes and

risk management as well as to better utilization of marketplace opportunities (Steyn, 2014; Simnett et al., 2015). In the long-term the aforementioned are expected to contribute to greater business performance (Blacksun, 2014; Maniora, 2015; del Mar Miralles-Quiros et al., 2017). Moreover, since the preparation of integrated reports requires combination of information from various internal sources, firms are encouraged to restructure their existing Management Control System (MCS) infrastructure and invest in an integrated MCS. This in turn results in more efficient internal processes providing more timely and comprehensive information to investors increasing their satisfaction (Simnett et al., 2015; Mio et al., 2016).

On the contrary to the aforementioned, implementing integrated reporting is associated with high costs incurred for the systematic measurement and preparation of integrated reports as an orderly process throughout enterprises (Adams & Simnett, 2011). This, may act as a deterrent for small and medium-sized enterprises, which may not be in a position to afford such a costly process (Berthelot et al., 2012; Frías-Aceituno et al., 2013), choosing not to follow an integrated reporting approach on a voluntary basis.

2.2.2 Determinants of Integrated Reporting adoption

Past literature has attempted to identify which factors are associated with organizations' decision to adopt integrated reporting voluntarily and in what manner. Existing bibliography has traced various factors, which are presented below.

De Villiers et al. (2017) as well as De Graaff and Steens (2019) classify such factors in two distinct categories: internal or otherwise, firm-specific characteristics, and external environment factors. Company characteristics refer to firm size, profitability, growth prospects, leverage, organizational culture, corporate governance, mainly the role of boards of directors, industry sector, CSR report assurance and GRI compliance. Results about the way in which the majority of the company characteristics affect <IR> adoption are heterogeneous. Findings are definitive with respect to corporate governance, CSR report assurance and GRI compliance, for which a positive relationship has been demonstrated by the respective research studies (Frías-Aceituno et al., 2014; Sierra-García et al., 2015).

Concerning the external drivers, based on previous studies of Jensen and Berg (2012) and Fasan et al. (2016), they can be classified in societal, institutional and economic conditions of the countries on which corporations are located. Societal factors refer to the degree of diversity, collectivism, employee protection and firms' engagement in employees' training and development. More specifically, countries with more feminine culture and a higher level of collectivism in society have been found to pay more attention to diversity concepts increasing the significance of integrated reporting and incentivizing its adoption (Jensen & Berg, 2012; García-Sánchez et al., 2013). Additionally, the existence of strong employee

unions plays an important role in using integrated reports. Employee unions usually require firms to disclose information about their corporate values in terms of employees' protection and professional development and these can be effectively communicated through integrated reports (Jensen & Berg, 2012; Fasan et al., 2016).

Institutional factors are assumed to include countries' legal system and the degree of shareholders' protection. Concerning countries' legal system and adoption of <IR> empirical findings are mixed. Frías-Aceituno et al. (2013b) and Fasan et al. (2016) noted that it is more likely for civil law countries to have a greater level of <IR> disclosure quality, whereas Dragu and Tiron-Tudor (2013) found a small association and Jensen & Berg (2012) reported no relationship at all. About the degree of shareholder protection, past literature suggests that the higher it is, the more likely it is for corporations to practice <IR> and have a high level disclosures quality. However, the empirical evidence from Jensen and Berg (2012) showed a negative association between those.

The last category of economic conditions includes the level of market orientation, the degree of concentration of ownership and the strength of the economy of a country. Market-based economies depend significantly on shareholders (Jensen and Berg, 2012; Fasan et al., 2016). Therefore, they tend to boost shareholders' power and enable them to ask for more exhaustive reports, which favors the adoption of <IR>. Moreover, higher degree of ownership concentration in firms is negatively linked to the likelihood of implementing <IR>, since dominant firm owners generally do not use for their information publicly available reports. They are also afraid that extensive reports may reveal strategic advantages to competitors, which further prevents adoption of the integrated reporting approach. Concerning the state of countries' economy, higher economic development has been found to promote <IR> adoption, since firms located in such countries are prone to following new management instruments more rapidly (Jensen and Berg, 2012; Fasan et al., 2016).

From the aforementioned identified factors, great emphasis has been placed by a wide strand of literature on the factors related to firms' corporate governance mechanism due to its role in the modern business world. Scholars have analyzed the impact of certain board characteristics such as size, composition (i.e. executive and non-executive directors), diversity, activity, age etc. on voluntary disclosure practices of firms including integrated reporting (Klein, 2002; Xie et al. 2003; Frías-Aceituno et al., 2012; Qu et al., 2015; Zambon et al., 2019; Vitolla et al., 2020a; Vitolla et al., 2020b; Pistoni et al., 2022). Concerning the relationship of board activity and age with voluntary disclosures, the respective findings provided by literature are ambiguous. Only a few papers highlight that the frequency of board meetings and the age of the board members can affect disclosures practices and quality (Kanagaretnam et al. 2007), whereas most of them note there is no relationship between them (Karamanou & Vafeas, 2005). Therefore, for the purpose of

examining the association between corporate governance quality and integrated reporting, we will focus on three certain characteristics, namely board size, board independence and board gender diversity. A more detailed review of the relevant literature follows.

2.2.3 Corporate governance-related determinants of adopting Integrated Reporting voluntarily

First of all, it is essential to obtain an understanding of the term corporate governance, which has become one of the most topical issues at international level. Corporate governance refers to the internal system by which corporations are directed and controlled, while it identifies accountability as its key concept. This internal system includes organization's relationships with stakeholders, compliance with laws and regulations, internal procedures and controls, code of conduct, ethical standards and practices that may impact the way in which organizations are governed (Cadbury, 1992). In a broader sense, corporate governance ensures balance between economic and social/environmental goals as well as between individual and communal goals (Cadbury, 2000). The need for its development as a protective mechanism to shareholders' interests and rights arose from the separation of ownership and control in modern businesses, which creates the widely known "agency problem" (Jensen & Meckling, 1976; John & Sebnert, 1998). Effective corporate governance mechanisms can minimize agency conflicts, information asymmetries and opportunistic managerial behavior through dissemination of information on various aspects. In this context, strong corporate governance affects positively the reporting practices resulting in increased reliability and relevance of reported information (Simnett, Zhou & Hoang, 2016). Companies with high level corporate governance are assumed to have higher quality of voluntary disclosures (Beske et al., 2019).

In discharging corporate governance, the role of the board of directors is crucial (Fiori et al. 2016). The board is the main decision-making body within corporations. Its primary responsibility is to represent and safeguard the interests of diverse stakeholders' groups (Healy, 2002; Perrini, 2006; Frías-Aceituno et al. 2012), to which it is accountable (Solomon, 1999). Another main duty of the board is to mitigate managerial opportunism and align interests of shareholders and directors. This may lead to broader, more accurate and complete information disclosures related to both financial and non-financial issues (Amran & Hanifa, 2011; García-Sánchez et al. 2019). The latter responsibility can be extended to integrated reporting, which combines financial and non-financial (i.e., social and environmental) disclosures into a single report. In this case, however, the board should not only encourage managers to adopt integrated reporting, but also ensure that the issued integrated reports follow the principles of the IIRC framework and provide high quality data (Vitolla et al., 2020). In this sense, boards need to exercise a broader scope of control over integrated reports to ensure satisfaction of stakeholders' information needs and a high level of information content (Hichri, 2020).

Many studies investigated the relationship between corporate governance and integrated reporting (Bobitan and Stefea, 2017; Liao et al., 2016; Flammer et al., 2019; Higgins, 2019). Past literature suggested that corporate governance mechanisms including the board of directors and the audit committee, significantly affect the adoption choice of integrated reporting, the quality and the extent of information content into integrated reports (Hichri, 2020). In line with the majority of the existing research papers, we further analyze the association among board size, board independence, board gender diversity and integrated reporting.

Board Size

Board size is defined as the total number of both executive and non-executive members on board (Panasian et al., 2003; Levrau & Van den Berghe, 2007; Wang & Hussainey, 2013). A significant fraction of studies (Frias-Aceituno et al., 2013; Alfiero et al., 2017; Fasan & Mio, 2017; Kilic & Kuzey, 2018) has analyzed the linkage between the board size and voluntary disclosures in general as well as between board size and integrated reporting in terms of adoption and quality specifically. Notwithstanding its relevance, there is, in fact, no full consensus in past research. The vast majority of previous studies revealed a positive association between board size and integrated reporting, whereas some research papers found negative or no correlation at all.

Concerning the relationship between board size and integrated reporting, two divergent viewpoints have been expressed in literature. The most prominent opinion is that larger boards have sufficient members to share workload as well as a greater level of intellectual resources, knowledge, skills, competences and experiences (Adams et al., 2005; Hidalgo et al., 2011). These resources enable boards of larger size to become involved with various disclosure issues, ensure their accuracy and completeness and therefore, perform successfully their supervisory function (Fuente et al., 2017). Moreover, the existence of different perspectives may lead to a wider range of solutions being offered when necessary, so that investors' objectives are achieved (Eisenhardt & Bourgeois, 1988). In this way, larger boards exercise enhanced monitoring and controlling activities over managers' decisions (Gandia, 2008; Larmou & Vafeas, 2010; Alfiero et al., 2017), which in fact promote transparency and improve firms' disclosure practices (Gandía, 2008; Vitolla et al., 2020). Larger boards with the aforementioned educational and/or work experience diversity have been found more effective in preparing high-quality integrated reports, which clearly and explicitly present the existing interdependencies of diverse resources by connecting the pieces of information previously reported separately and providing valuable insights about corporations' potential (Alfiero et al., 2017; Frias-Aceituno et al., 2013). Finally, increased number of board members has been found to positively influence the level of materiality disclosures and foster social performance, since more members tend to represent a wider range of stakeholders (Fasan and Mio, 2017).

Previous studies have found that board size may be a significant determinant of integrated reporting adoption and quality considering that board of directors represents the only mechanism with the power to reward or penalize poor performers in terms of CSR and respective disclosures (Meniaoui et al., 2016). Supporting the above view, Busco et al. (2019) identified that companies with larger boards of directors tend to have a higher Integration Reporting index in an attempt to examine their respective level of information integration. Board size has been also found positively associated with integrated reporting adoption mainly due to IR multidimensional nature and purpose (Frías-Aceituno et al., 2013; Alfiero et al., 2017; Zambon et al., 2019). At the same time, increased board size is evidenced to advance disclosures quality overall (Melloni et al., 2015; Qu et al., 2015) and more specifically, integrated reporting quality (Vitolla et al., 2020a; Vitolla et al., 2020b).

On the other hand, literature has suggested that large boards of directors suffer from communication and coordination problems (Wang & Hussainey, 2013) and face difficulties in obtaining consent over certain issues (Jensen, 1993). Consequently, boards' decision-making process becomes slower, whereas its effectiveness is reduced with a negative impact also on disclosures' quality and materiality (García-Sánchez, 2010; Fasan & Mio, 2017; Alnabsha et al., 2018). Based on the above, Fuente et al. (2017) suggested that smaller boards lead to increased quality of integrated reporting. They also showed that firms with smaller boards tend to demonstrate a higher level of transparency regarding the environmental impact of their activities.

Board Independence

Board independence is another important aspect of corporate governance found to be positively correlated to integrated reporting and in general, to voluntary disclosure practices (Rao & Tilt, 2016). Board independence is defined as the number of non-executive board members divided by the total number of board members (Prabowo & Simpson, 2011). The majority of the Eurozone markets have adopted board independence standards requiring that at least half of board members are independent directors (Mishra, 2018).

Non-executive directors are considered independent, since they are not involved in business management, their remuneration is not linked, by any means, to firm's short-term financial performance and their career prospects are not affected by CEOs' decisions (Jizi et al., 2014). Being independent they tend to focus on the long-term value of the company in favor of shareholders' interests and be less opportunistic compared to managers. The presence of non-executive directors within board enhances its ability to alleviate agency conflicts and curb managerial self-interest, while it is expected to significantly reduce earnings management (Rhodes et al., 2000; Bar-Yosef & Prencipe, 2009). Additionally, independent directors place emphasis on firm conduct in an attempt to ensure proper operation, improve its reputation and contribute to the accomplishment of firm's mission

and objectives. Therefore, Fama and Jensen (1983) argued that a greater level of board independence can lead to more effective control and monitoring activities over management's performance. Moreover, non-executive board members demonstrate a strong commitment to accountability and transparency, which in conjunction with all aforementioned board characteristics may lead to an increase in both quality and quantity of voluntary disclosures (Fama & Jensen, 1983; Michelon & Parbonetti, 2012). Regarding the latter about dissemination of more information, it may also be attributed to the fact that non-executive directors consider carefully stakeholders' expectations and are more willing to respond to new information needs, since they face no pressure to avoid disclosing critical information to competitors (García-Sánchez et al., 2011).

The aforementioned characteristics of boards with increased non-executive members are in favor of <IR> adoption, which is governed by similar concept and fundamental principles. Previous studies have shown that board independence increases the extent and the quality of environmental and social disclosures as well as of intellectual capital reporting (Kathyayini et al., 2012; Dah et al., 2018; Alfraih, 2018). Specifically, in the context of integrated reporting, Fasan & Mio (2017) as well as Vitolla et al. (2020) found that highly independent boards affect positively integrated reporting quality by fostering disclosure of all material issues. According to research performed by Stacchezzini et al. (2016), the integrated reports of companies with fewer independent board members are focused on sustainability actions instead of sustainability performance.

Board gender diversity

Board diversity can be defined as the difference in characteristics of board members in terms of gender, age, race, learning style, educational background and expertise (Robinson & Dechant, 1997; Cofey & Wang, 1998; Van der Walt & Ingley, 2003; Hanifa & Cooke, 2005). Concerning the manner in which board diversity affects adoption and quality of integrated reporting, among the aforementioned different types of board diversity, literature has especially focused on gender diversity (Alfiero et al., 2017; Vitolla et al., 2019; Frias-Aceituno et al., 2013).

The reason for which gender diversity is crucial in the context of <IR> is due to social and cultural differences observed between men and women (Liao et al., 2015). The two genders present differences in skills, communication styles, educational backgrounds, personality characteristics, values and behavioral models (Feingold, 1994; Buss, 2005; Hofstede et al., 2010). Bear et al. (2010) argue that women in managerial roles often stimulate more participative communication among board members, while Huse and Solberg (2006) state that female members tend to be more diligent, highly devoted and involved in board activities promoting a good cooperative working environment. Moreover, the presence of female directors on boards usually brings alternative perspectives to the board as well as a

greater level of charitable interaction, innovation and creativity (Watson et al., 1993; Wang & Cofey, 1992; Williams, 2003). Previous empirical studies have indicated that female board members influence the corporate behavior in a positive way and strengthen board's effectiveness due to their characteristics mentioned previously (Adams & Ferreira, 2004). In addition to the above, due to their multiple role in society (e.g. wife, mother, employee) women are considered to apply more ethical criteria compared to men (Kessler-Harris, 1990), and they usually demonstrate a more developed sensitivity towards environmental and social issues (Barako & Brown, 2008; Prado-Lorenzo & García-Sánchez, 2010; Rahman & Rubow, 2011). These characteristics advance transparency and quality of corporate disclosures (Gibbins, 1990; Adams & Ferreira, 2009; Srinidhi et al., 2011), especially when it comes to sustainability issues (Prado-Lorenzo & García-Sánchez, 2010; Frías-Aceituno et al. 2012).

Taking into consideration previous studies' findings as discussed above, boards with more female directors are more likely to have positive attitude towards new concepts and fresh ideas, respect to society and natural environment affected by business operation, deeper understanding and fulfillment of the needs of diverse stakeholders and strong commitment to moral values (Frías-Aceituno et al., 2012; Fiori et al., 2016). Therefore, we would expect that board gender diversity acts in favor of <IR> adoption and quality. However, past research has shown that there is no consensus about their relationship. Some previous studies have shown that the aforementioned features increase the level of corporate voluntary disclosures in general (Fernandez-Feijoo et al., 2012; Rao and Tilt, 2016) and specifically in the context of integrated reporting, they can facilitate its adoption and accelerate transition towards it (Frías-Aceituno et al., 2012; Alfiero et al., 2017; Vitolla et al., 2020). Kiliç and Kuzey (2018) highlighted that board gender diversity has a significant positive impact on both quantity and quality of forward-looking disclosures included into integrated reports. Furthermore, a number of studies examined the role of female directors of boards based on the Critical Mass theory, which suggests that only boards with at least three women (critical mass) can improve firm value creation (Carver, 2002; Cassell, 2000), on which integrated reporting places emphasis.

On the other hand, Fasan and Mio (2017) found that increased number of women on boards deteriorates the materiality disclosure quality. They provided as a possible explanation the fact that firms implementing <IR> are interested in ensuring board gender diversity as a signal to capital markets rather than actual actions. Thus, the appointment of women on board may be conducted so that corporate governance best practices are followed without consideration of their previous experience and competencies. A negative association of board gender diversity and <IR> was also found by Pistoni et al. (2022), who suggested that their findings may be supported by the Token Theory (Kanter, 1977b). According to the Token Theory, members of an under-represented group, like women on boards, may face difficulties in effectively contributing to board decisions (Nielsen & House, 2010).

2.2.4 Relationship of Integrated Reporting with Corporate Social Responsibility reporting and performance

For the purpose of reviewing the kind of relationship existing between corporate social responsibility performance and reporting with <IR>, we first need to clarify what is meant by these terms. During the last few years, the term of corporate social responsibility (CSR) has been widely spread globally. The most prominent definition of CSR states that “*The social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time*” (Carroll, 1979; 499). An increasing number of firms has already engaged in activities promoting environmental protection, economic sustainability, socio-economic development, human rights, fair labor practices including welfare and training, and charity donations, which are typically considered CSR (Gao and Zhang, 2015; Ioannou and Serafeim, 2015; Alawamleh, 2020; Anagnostopoulou et al., 2021). Previous studies have shown that corporations, which embrace the concept of CSR are more likely to have a corporate culture of cooperation, trust and ethical behavior (Carroll, 1979; Jones, 1995; Phillips et al., 2003; Hoi et al., 2013; Gao et al., 2014).

Firms’ disclosures about their performance on CSR issues is referred, in literature, as CSR reporting. Christensen et al. (2021) define CSR reporting as “*the measurement, disclosure, and communication of information about CSR or ESG topics, activities, risks, and policies*”. Nowadays, engagement to this kind of reporting has become a mainstream business practice (KPMG, 2013). Disclosures related to CSR may be issued alongside with the set of financial statements within the annual report or separately in a distinct report known as sustainability, corporate accountability or non-financial report (Christensen et al., 2022). Selection of the way, in which CSR disclosures are presented, depends on the jurisdiction on which firms operate and the respective requirements in effect. CSR reporting practice has been criticized that despite disclosure of useful non-financial information, it doesn’t provide clear linkages between such information and firm’s strategy, risks, financial performance and long-run ability to create value resulting in reports of limited use to capital providers (Eccles & Krzus, 2010; Eccles & Serafeim, 2014; Serafeim, 2015). According to stakeholder, legitimacy and resource dependence theories, CSR performance and reporting can be value-enhancing for firms (Wang et al., 2020 summarizing McWilliams & Siegel, 2001; Schmidt et al., 2003) being consistent with the principals’ interests (Ferrel et al., 2016).

Integrated reporting is expected to go beyond the scope of non-financial reports like stand-alone CSR reports (Obeng et al., 2021) based on the IIRC’s stated objective of providing information on a broader range of capitals and promoting integrated thinking internally within corporations (IIRC, 2013). From the early stages of introduction of the integrated reporting approach, the IIRC (2011) has suggested four valid pathways for companies to

embrace <IR> adoption: first, integrating the CSR report into the annual report, a practice that does not necessarily constitute an integrated report; second, publishing a stand-alone integrated report for companies without previous CSR experience; third, modifying the CSR report and referring to it in the annual report for companies with previous CSR experience; or fourth, adopting <IR> only in the internal Management Control System (Lueg and Radlach, 2015).

Past literature has evidenced that prior experience of firms in practicing CSR reporting is crucial regarding their decision for adopting <IR>. In general, a positive correlation between CSR reporting and transition to <IR> has been found (Frías-Aceituno et al., 2014; Sierra-García et al., 2015; Amami & Maalez, 2015; Lueg et al., 2016). According to Frías-Aceituno et al. (2014) corporations with long experience in preparation of CSR/sustainability reports are more likely to choose transition to integrated reporting. Similarly, Lueg et al. (2016) noted that organizations' engagement in <IR> and successful application is greatly shaped by their embracement of and commitment to CSR concept. For companies with the above characteristics, the adoption of integrated reporting seems to be the next logical step.

In addition to the above, Sierra-García et al. (2015) found that the likelihood of adopting <IR> is higher for companies, whose CSR reports are assured by external auditors. Credibility of CSR reports is an important issue due to special features of non-financial information (De Meyst et al. 2018) and due to the fact that any mistakes related to sustainability may not be easily discovered prior to reporting (Michelon et al., 2019). Since assurance over non-financial reports by any external party is not mandatory by the applicable EU Directive 2014/95/EU (NFRD), only companies interested in enhancing credibility of their reports and strengthening their brand name, get assurance over their reports (Simnett et al., 2009). Moreover, Amami and Maalez (2015) suggested that firms with good corporate governance systems such as effective boards of directors and increased stakeholders' power, are involved with CSR practices and thus, propensity to adoption of <IR> is increased. In addition to the above, existence of CSR or sustainability committees has been found to act in favor of the inclusion of a greater level of information in integrated reports and of increased compliance with the IIRC framework (Ahmed Haji and Anifowose, 2016).

2.2.5 Impact of Integrated Reporting application on firm valuation

Another aspect of integrated reporting about which empirical studies have demonstrated great interest is what kind of impact the integrated reports have on business market valuation and analyst forecast accuracy. During the previous years, empirical research was mostly focused on the jurisdiction of South Africa, where application of <IR> is mandatory and more available data exist (Baboukardos & Rimmel, 2016; Lee & Yeo, 2016; Barth et

al., 2017; Zhou et al., 2017; Bernardi & Stark, 2018; Baboukardos & Kopita, 2019). However, recently studies about voluntary adopters of <IR> around the globe have been performed (Arguelles et al., 2017; Wu & Zhou, 2021; Obeng et al., 2021). It is not clear whether the results of the studies based on South African corporations, which practice <IR> mandatorily, can be extrapolated to voluntary reporting environments. Different reporting incentives under voluntary settings may lead to different capital market implications (Christensen et al., 2015). However, results of these studies provide valuable insights on the relationship between <IR> and business valuation.

Before we analyze the findings of past research, it would be useful to present the two possible and opposite ways in which, according to the existing bibliography, integrated reporting may influence business valuation. The most prominent view is that integrated reporting is value enhancing. The IIRC (2013) underlines that companies practicing integrated reporting are more likely to benefit from positive capital market effects mainly due to enhanced transparency and the introduction of integrated thinking process. In this way, information asymmetry between providers of capital and managers can be reduced resulting in fewer agency conflicts and enabling both investors and debtholders to effectively allocate their capital resources (Lee & Yeo, 2016). The aforementioned arguments provide valid explanations about why implementation of integrated reporting may lead to reduced information acquisition and processing costs (IIRC, 2013), which in turn should improve the speed and the amount of firm-specific information being incorporated into asset prices (Lee & Yeo, 2016 summarizing Healy and Palepu 2001; Sims 2006; Veldkamp 2006). Studies on voluntary disclosures suggest that corporations will decide to disclose information on a voluntary basis only if they will be benefited from such practice (Healy and Palepu 2001).

The second view supports that disclosing a large amount of information, especially when linked to strategic information about business model, risk management process, identified opportunities etc., through integrated reports may cause damages to firm value, since such information could be exploited by competitors. This viewpoint is in line with the proprietary disclosure theory (Verrecchia, 1983), which states that organizations' incentive to disclose information is reduced by the attached potential proprietary costs. Furthermore, Arya et al. (2010) suggested that firms' motives to disclose additional information voluntarily are weakened, when it is probable that such information is in favor of one business segment and at the expense of another. Considering that <IR> disclosures demand increased resources in terms of cost, time and effort to ensure compliance with the applicable Framework, firms' value could be negatively affected (Lee & Yeo, 2016).

We will further analyze the empirical findings of past research under both mandatory and voluntary reporting regimes of integrated reporting. A number of archival studies examined directly the association of practicing integrated reporting with firm valuation, while some

others analyzed other issues related to integrated reporting, which may indirectly lead to market implications. Overall, a positive association between <IR> and business valuation has been evidenced by the vast majority of past research in both reporting environments.

More specifically, Baboukardos & Rimmel (2016) examined the value relevance of integrated reports by comparing the period before and after mandatory adoption in South Africa. They discovered that value relevance of earnings was favorably affected, whereas the value relevance of equity book value was decreased conveying mixed results about firm valuation. On the same direction, Mervelskemper and Streit (2016) and Lopes et al. (2017) based on global samples examined the value relevance of <IR> adoption focusing on its impact on book value of equity, book value of net income, stock prices etc. and evidenced that implementation of the new reporting type was value enhancing.

In the context of their study, Lee & Yeo (2016) concluded on positive relationship between <IR> disclosures and firm valuation through measurement of the “integratedness” level of JSE listed companies’ integrated reports during the first four years of <IR> adoption mandate in South Africa. Their findings indicated that this positive linkage is stronger in firms characterized by high organizational complexity (i.e., multiple business segments, large size, increased volume of intangible assets). In addition to the above, Lee & Yeo (2016) found that market participants considered analysts’ reports less value-relevant after release of King III Report, since valuable information previously obtained through analysts’ reports could now be traced by users into integrated reports. The latter has been also investigated by other researchers (i.e. Baboukardos and Kopita, 2019; Abhayawansa et al., 2018; Slack & Tsalavoutas, 2018; Reimsbach et al., 2017), who concluded on the same results demonstrating that integrated reports may be perceived as substitutes of analysts’ recommendations by the market, which in turn leads analysts to refrain from using integrated reports for valuation purposes.

Barth et al. (2017) extended literature by examining the channels through which integrated reporting quality is linked to firm value focusing on the same period and jurisdiction like Lee and Yeo (2016). They identified two channels: the capital market channel relating to the quality level of information disclosed to outside capital providers and the real effects channel relating to better internal decision-making processes. Their empirical models disaggregated firm value into three components: liquidity, cost of capital, and expected future cash flows and provided evidence supporting both channels. Specifically, they found that higher <IR> quality results in higher stock liquidity, considered as market channel, by stimulating trading by informed capital market participants. Moreover, they suggested that higher <IR> quality increases expected future cash flows, which can be considered as a market channel (i.e., informed investors predict cash flows more accurately) as well as a real effects channel (i.e., improved decision-making by managers leads to higher realized

future cash flows). Concerning cost of capital, they documented no existing association with the quality of integrated reports.

Similarly, Zhou et al. (2017) examined the implications of the integrated reporting approach in South Africa on analyst forecast accuracy as well as on the implied cost of capital. Specifically, they discovered that the more the integrated reports are prepared in alignment with the applicable framework, the less is the analyst earnings forecast error and dispersion indicating that the information content of integrated reports is useful during assessment of firms' future financial performance. In addition to the above, Zhou et al. (2017) documented that integrated reports of greater alignment with the respective framework are related to lower cost of capital and lower realized market returns consistently with previous studies (Jones et al., 2007; Hong and Kacperczyk, 2009) supporting the statement that investors accept more easily a lower rate of return due to the reduced information risk arising from <IR> disclosures, especially for firms with small analyst followings. Bernardi and Stark (2018) confirmed the aforementioned findings of Zhou et al. (2017) in respect of <IR> disclosures' impact on analyst forecast accuracy based on a sample of 40 South African companies during the pre- and post-mandatory <IR> period.

In the context of voluntary adoption, Arguelles et al. (2017) focused on an international sample firms of in the period 2009-2013. They found that companies, which engaged in IIRC Pilot Program or self-declared adoption of integrated reporting in the Global Reporting Initiative (GRI) database as a signal of early-moving firms, were valued higher than those which did not by capital markets. Moreover, their findings demonstrated that the value relevance of disclosures made under <IR> principles was increasing over time. At the same time, Mervelskemper and Streit (2017) based on a global sample of firms for the years 2010-2014 provided empirical evidence that integrated reports are superior to stand-alone ESG/CSR reports. Integrated reports were found to enhance market valuation of firms' ESG/CSR performance at no additional costs suggesting that firms with strong ESG/CSR performance have a great incentive to switch from stand-alone non-financial reports to integrated reporting. In case of firms that do not disclose information on ESG performance at all, Mervelskemper and Streit (2017) suggested that they could be benefited from engaging directly in integrated reporting. Contradicting the findings of Mervelskemper and Streit as above, Maniora (2017) using a sample of voluntary adopters in the period 2002-2011 highlighted that switching from stand-alone ESG reports to integrated reporting is not actually beneficial. Maniora suggested that such a transition can be worthwhile only for firms reporting their ESG performance integrated in annual reports or not at all. Interestingly, her empirical findings, which cannot be overlooked, reject the generally accepted belief that integrated reporting is a superior reporting mechanism.

In addition to the above, Serafeim (2015) analyzed the association between integrated reporting and firms' investor base examining companies practicing <IR> around the globe for the years 2002-2010. He proposed that practicing <IR> may constitute a signal for firms' investment preferences attracting investors with similar characteristics. Reversely, he stated that adoption or not of <IR> may reflect the preferences of the existing well-established investor bases. However, Serafeim (2015) concludes that changes in integrated reporting approach are those leading alterations in investor bases and not vice versa. In most cases, he found that practicing <IR> attracts more dedicated investors willing to hold stocks for a longer period of time serving the long-term orientation of firms towards performance. His findings were stronger for firms with high growth potential, with no or limited ownership by the founding family and those operating in "sin" industries such as alcohol, firearms, tobacco, gambling, nuclear and military businesses etc.

Recently, Obeng et al. (2021) using a sample of firms, which voluntarily issued integrated reports, from 35 countries for the years 2009-2017 demonstrated that a high level of <IR> practice can mitigate agency conflicts and result in lower agency costs. They supported that the aforementioned relationship is more intense in stakeholder-oriented countries compared to shareholder-oriented countries. In the same direction, Wu and Zhou (2021) examined whether engagement in the reporting regime of <IR> is followed by lower levels of managerial myopia using a global sample. Their evidence indicated that adoption of an integrated approach in reporting is accompanied by engagement in less accrual-based earnings management and more real activities earnings-management, especially in countries where <IR> is required. Despite the fact that the above findings do not directly affect firms' performance, they can assist in achievement of higher business performance over the long-term horizon.

2.3 Hypotheses Development

For the purpose of this study, we will firstly examine what kind of relationship exists between corporate governance factors and voluntary adoption of integrated reporting in the Eurozone. From the literature review section above, it is clear that the corporate governance mechanism within corporations is fundamentally based on the role of the board of directors. Therefore, in alignment with the majority of existing literature (Frías-Aceituno et al., 2013; Sierra-García et al., 2015; Girella et al., 2019; Vitolla et al., 2020a; Vitolla et al., 2020b; Pistoni et al., 2022), we will focus our study on how individual board characteristics in terms of size, independence and gender diversity, are associated with the voluntary adoption of integrated reporting.

Concerning the board size and its association with adoption of integrated reporting, two contrasting viewpoints have been expressed by the existing bibliography as presented in the literature review section above. According to the most prominent viewpoint, larger boards

are characterized by sufficient resources enabling them to better exercise their monitoring activities over management and become deeply involved in supervising disclosures affecting the type and the quality of firms' corporate disclosures. The second viewpoint expresses the opposite opinion. Taking into consideration also the majority of the empirical research findings (Frías-Aceituno et al., 2013; Meniaoui et al., 2016; Alfiero et al., 2017; Zambon et al., 2019), which suggest that increased number of board members acts in favor of <IR> adoption, we embrace the first and most prominent theory and thus, we introduce the following hypothesis:

H₁: Board size is positively associated with the adoption of integrated reporting voluntarily.

Regarding board independence, the past literature provides justification for a positive linkage to practicing integrated reporting. Due to the fact that non-executive board directors are considered independent of businesses' daily management, they care foremost about protecting shareholders' and remaining stakeholders' interests and rights and boosting transparency and accountability within corporations (Fama & Jensen, 1983). Theory is corroborated by empirical research findings, which provides consensus that greater board independence can positively affect voluntary adoption of integrated reporting along with the respective disclosures quality and extent (Fasan & Mio, 2017; Stacchezzini et al., 2016; Vitolla et al., 2020a; Vitolla et al., 2020b). For the aforementioned reasoning, we formulate the following second hypothesis:

H₂: Board independence is positively associated with the adoption of integrated reporting voluntarily.

In respect of the board gender diversity and its relationship with firms' decision about adopting the integrated reporting practice voluntarily, the literature proposes that female directors have some personality characteristics favoring voluntary sustainability disclosures and thus, also adoption of the integrated reporting initiative (Kessler-Harris, 1990; Williams, 2003; Prado-Lorenzo & García-Sánchez, 2010). These characteristics refer to increased sensitivity to societal and environmental dimensions, diligence and commitment to tasks assigned to them, increased adherence to ethical standards etc. However, empirical research findings convey mixed results. Following the majority of empirical researches (Frías-Aceituno et al., 2012; Alfiero et al., 2017; Girella et al., 2019; Vitolla et al., 2020) revealing that more women on boards tend to increase firms' propensity to adopt <IR>, which is also in alignment with the theoretical background provided by literature, we suggest the following hypothesis:

H₃: Board gender diversity is positively associated with the adoption of integrated reporting voluntarily.

In the context of the current thesis, we will secondly examine only for the firms that adopted integrated reporting in the Eurozone during the selected time period of years 2007-2021 how this decision is linked to their market valuation. Based on the literature review section and the claimed benefits from the IIRC as well as the findings of numerous qualitative studies (Eccles & Serafeim, 2014; De Graaff & Steens, 2019), we adopt the viewpoint that disclosures under the principles of integrated reporting can improve corporations' performance over the short, medium and long-term horizon and result in enhanced valuation. According to the vast majority of empirical results, integrated reporting practice is linked to enhanced value relevance of disclosures (Baboukardos & Rimmel, 2016; Arguelles et al., 2017; Mervelskemper & Streit, 2017), reduced cost of capital (Zhou et al., 2017), higher stock liquidity and expected future cash flows (Barth et al., 2017), and higher overall firm valuation (Lee & Yeo, 2016). Despite the opposite findings of Maniora (2017) that integrated reports are of no additional value to businesses compared to existing CSR/sustainability reports, we adopt the empirical findings of the majority of scholars and therefore, we develop below our last hypothesis to be examined:

H₄: Voluntary adoption of integrated reporting is positively associated with firm market valuation.

3. Sample selection & Research methodology

3.1 Sample Selection

Sample data used to test the hypotheses stated in the previous section were retrieved from the database provided by Refinitiv Datastream (Thomson Reuters until October 2018), which allowed access to Worldscope and ESG data. Refinitiv is ranked amongst the world's largest providers of financial markets data and infrastructure. It offers one of the most comprehensive ESG databases in the industry providing more than 630 different ESG metrics for more than 12,000 global companies (Refinitiv, 2022). Refinitiv has been used as a source of data for numerous empirical researches (indicatively, Serafeim, 2015; Baboukardos & Rimmel, 2016; Arguelles et al., 2017; Wu & Zhou, 2021) and is considered reliable.

Our sample data refer to companies listed on stock exchanges based in the 19 countries of the Eurozone for the period commencing in 2007 and ending in 2021, when most recent data were available. According to literature (White, 2005; Todd, 2005) integrated reporting became increasingly popular among companies since 2005. Therefore, we left out of our sample the first two years (2005-2006) of integrated reporting adoption in order to ensure our sample will be more representative of the results concerning both the impact of corporate governance quality on voluntary adoption of an integrated reporting approach as well as the relationship of integrated reporting with firms' market valuation.

The criteria applied during selection of our data were “equity” type, euro currency, both active and dead companies. From our sample we excluded sectors related to banking, insurance and real estate. Specifically, we excluded sectors labelled as “Banks, Financial services, Real estate investment & services, Real estate investment trusts, Life insurance, Non-life insurance and Unclassified” in Refinitiv database due to their peculiar financial and business nature (Fama & French, 1992). It is common practice in empirical studies to exclude these sectors, since they are subject to different regulation and apply certain accounting practices (Buertey et al., 2019), which may not be comparable to other sectors.

From the initial sample of 9,014 firms retrieved from Refinitiv database based on the above criteria, we removed firms for which no available data regarding application of integrated reporting existed across the entire period 2007-2021. From the remaining 997 corporations, we excluded those included into the sample more than once, those being cross-listed in more than one stock exchanges as well as those with negative book value of equity. Moreover, we deducted from the sample any firms applying accounting standards other than the International Financial Reporting Standards (IFRS) like US GAAP, local accounting standards etc. for even one year in order to ensure accounting uniformity and comparability resulting in a sample of 446 companies.

In order to classify sample firms into industries with similar risk characteristics we used Fama & French classification system (1997). First of all, we extracted from Refinitiv database a 4-digit Standard Industrial Classification (SIC) Code 1 (refer to Appendix A for detailed definition) and ensured that SIC Code 1 was available for all 446 sample firms. We identified that ten sample companies had a SIC Code 1 ranging between 60-67 categories¹, which relate to Finance, Insurance & Real Estate sector and thus, we excluded them from our sample for the reasons previously mentioned. Afterwards, using the Stata software we linked SIC Code 1 to 48 industry groups following the Fama & French classification system (1997). Based on Stata’s results no classification to any of the Fama-French 48 industry sectors was found for two firms and thus, we deducted them from our sample.

Therefore, our final sample consists of 434 individual firms incorporated in 13 Eurozone countries and operating in 40 different industry sectors resulting in 6,510 firm-year observations over the period 2007-2021. Table 1 details the sample selection process (Panel A) and provides country (Panel B) and industry (Panel C) distributions.

Insert Table 1 here

All required accounting and ESG data have been collected from Worldscope and ESG Refinitiv databases on an annual basis. Winsorization at levels 1% and 99% has been

¹ Classification categories have been traced to <https://siccode.com/>.

applied to all continuous variables used in our research models so that sample size is retained at its current level of 434 firms and results are not driven by outliers following Dhaliwal et al. (2012) and Zhou et al. (2017).

3.2 Detection of Integrated Reporting adopting firms

When it comes to empirical research related to application of integrated reporting outside the jurisdiction of South Africa, where all public entities are required to comply with the issuance of integrated reports, there is objectively difficulty in identifying firms that have actually adopted integrated reporting as envisaged by the International <IR> Framework. Scholars have argued that there is no straightforward way to acknowledge the number of firms, which release integrated reports, since integrated reporting is a concept rather than a set of accounting standards like IFRS (Serafeim, 2015; Obeng et al., 2021). Even harder, it is to assess the quality of integrated reports given the fact that subjective judgement is exercised during both the preparation and presentation of their information content. Due to the aforementioned difficulties, it has been observed that some companies merely declare their annual reports, which only present a combined reporting strategy without adherence to <IR> principles, to be integrated (De Villiers et al., 2017). Conversely, there are firms that may not label their reports as “integrated”, even if such reports apply the integrated reporting concept in an exemplary manner for years (EY, 2014; Eccles & Serafeim, 2014).

Therefore, it is crucial to select an appropriate proxy for detecting integrated reporting adopting firms. Scholars have used various ways to identify whether organizations follow an integrated reporting approach and if so, at what degree. One possible way to detect adoption of IR is to retrieve data from a database or a combination of databases in alignment with a significant part of previous studies. There are several databases (i.e. Bloomberg, Refinitiv, KLD, Compustat Global), which provide access to diverse environmental, social and governance measures as well as to indicators about use and quality of integrated reports. Another way to extract information related to IR adoption could be from the official website of the International Integrated Reporting Council (IIRC), the Global Reporting Initiative (GRI) database and the members’ list of the IIRC’s Pilot Program, although the latter may be more useful for researches referring to the first years of IR application (Arguelles et al, 2017; Hsiao et al., 2019). Apparently, databases provide the benefit of producing data for a large sample of firms relatively quickly, whereas any form of hand collection can be a time-consuming process involving inevitably sample size trade-offs and increased risk of errors (De Villiers et al., 2017).

For the purpose of our research, we use data retrieved from Refinitiv database as previously explained. More specifically, for the measurement of our dependent variable (*IR_Adoption*) regarding the first point under examination being the association of firms’ corporate governance quality with their decision for adopting an integrated reporting approach

voluntarily, we use the data item “CGVSDP018” from the ESG database of Refinitiv following Serafeim (2015), Wu & Zhou (2021) and Obeng et al. (2021). According to ESG database, the certain data item represents whether corporations integrate financial and extra-financial information in the management discussion and analysis (MD&A) section of their annual report or not, considering data contained in the MD&A section, in the business summary analysis as well as in the business review of annual reports. It provides a sign to investors about the commitment and the effectiveness of corporations’ management in establishing their vision and strategy as well as about their capacity to successfully transmit the message that economic, environmental and social dimensions are integrated in the daily decision-making processes. It has to be noted that the data item we use is an indicator proxy taking the value of “Yes” for firms following an integrated reporting approach and the value of “No” otherwise, whereas the data item used by Serafeim (2015), Wu & Zhou (2021) and Obeng et al. (2021) was a composite IR score with values ranging within the scale 0-100. In 2022, Refinitiv Database provides no more integrated reporting scores but only indicator values concerning the application of an integrated reporting method. However, the aforementioned two data items were closely related based on the glossary of ESG database (formerly ASSET4), which states that an IR score was available only for corporations for which this indicator proxy about practicing integrated reporting was taking the value of “Yes” demonstrating that integrated reports were used. For easier use in regressions, we transform the data item into a binary variable taking the value of one for “Yes” and the value of zero for “No”.

3.3 Measurement of Corporate Governance

For the measurement of the corporate governance level within organizations, which represents the independent variable in our attempt to investigate the link between corporate governance and preparation of integrated reports, we employ two different ways.

Firstly, we disaggregate corporate governance mechanism into three distinct governance-related factors based on board characteristics, namely board size, board independence and board gender diversity, consistently with a significant portion of previous studies (Frias-Aceituno et al., 2013a; Alfiero et al., 2017; Girella et al., 2019; Vitolla et al., 2020a; Vitolla et al., 2020b; Pistoni et al., 2022). We identify each one of these characteristics as an independent variable and we measure them accordingly. More, specifically, for the measurement of board size we introduce a variable (*BoD_size*) equal to the total number of board members at the end of each fiscal year (CGBSDP060) following numerous studies (Frias-Aceituno et al., 2013a; Alfiero et al., 2017; Buerter et al., 2019; Hsiao et al., 2019; Vitolla et al., 2020a). Concerning board independence (*BoD_independence*), we measure it through the percentage of non-executive directors participating in the board scaled by 100 (CGBSO06V) in alignment with De Andres, Azofra, & Lopez, 2005; Frias-Aceituno et al., 2013a; Buerter et al., 2019; Girella et al., 2019; Vitolla et al., 2020a). Regarding board

gender diversity (*BoD_diversity*), we measure it through the percentage of female directors being members of the board scaled by 100 (CGBSO03V) in line with the studies of Alfiero et al. (2017), Girella et al. (2019), Vitolla et al. (2020).

Secondly, for a more comprehensive approach, we also measure enterprises' overall corporate governance performance using a variable (*GOV_Score*) based on data provided by the Governance Pillar Score (CGSCORE) of ESG Refinitiv database. More specifically, the Governance Pillar Score measures the effectiveness of corporations' internal processes and systems in ensuring that both board members and managers act in the best interests of long-term shareholders. According to the ESG database, the aforementioned proxy depicts firms' ability to direct and control their activities towards creation of value over term and it is calculated by equally-weighting and z-scoring all underlying data points and comparing them against all remaining firms included in ESG Refinitiv database. Thus, the resulting score is normalized and its values range between 0 and 100. A higher value reflects a stronger governance system and enhanced capacity for directing and controlling governance practices.

We feel the need to clarify that the overall governance score (*GOV_Score*) previously analyzed is used as substitute of the three abovementioned individual corporate governance characteristics (*BoD_size*, *BoD_independence*, *BoD_diversity*) in the form of a robustness test for estimating the association between corporate governance quality and adoption of an integrated reporting approach voluntarily.

The Appendix presents a detailed description of all data items extracted from the ESG Refinitiv database.

3.4 Control Variables

In order to ensure that the results of our study will not be driven by certain characteristics, which according to past literature are likely to be correlated with firms' decision for adoption of IR practice and market valuation, and also to eliminate the omitted-variable bias at an acceptable level, we incorporate into our models several key control variables. Selected control variables are in alignment with previous research (Dhaliwal et al., 2012; Lourenco et al., 2014; Qiu et al., 2014) and control for fundamental corporate characteristics, existence of audit committees, previous experience with CSR reporting and performance related to environmental and social matters.

Firm Size

Firm size has been widely used in the literature as a proxy for firms' information environment (Atiase, 1985). The vast majority of previous studies show a positive

relationship between the extent of corporate voluntary disclosures and firm size (Healy & Palepu, 2001; Archambault & Archambault, 2003; Makni et al., 2009). Regarding the transition to integrated reporting, previous research has evidenced that firm size can be a significant determinant of becoming an early adopter (Frias-Aceituno et al., 2013; Sierra-Garcia et al., 2015; Arguelles, Balatbat & Green, 2017), while Lai et al. (2016) demonstrated that company size has no effect on IR adoption. Larger corporations tend to be pioneers in adopting new reporting practices in order to signal they are managed in a transparent and ethical manner, enhance their reputation, respond to the increased information demands of their broad stakeholder base and maintain or reduce existing agency costs, especially in case external financing is their main source of capital (Girella et al., 2019). Moreover, larger companies have usually sufficient available resources to employ qualified and experienced staff, which can influence the implementation of new concepts in a positive way (Maniora, 2017). On the other hand, through extensive disclosures firms are exposed to stricter monitoring from regulators and investors, which may deter adoption of reporting types with increased disclosure requirements (Wallace et al., 1994). Thus, we include in our model a variable to control for the size effect (*Size*), computed as the natural logarithm of total assets consistently with prior research (Baboukardos & Copita, 2019; Anagnostopoulou et al., 2020; Obeng et al. 2020). We embrace the first view about firm size and we expect it will be positively correlated to a firm's decision about IR adoption.

Profitability

Previous studies conveyed mixed results about the association between profitability and integrated reporting. Lai et al. (2016) as well as De Graaff & Steens (2019) found there is no significant relationship between profitability and adoption of new reporting approaches such as IR, whereas at the other extreme Arguelles et al. (2017) identified profitability measured through return on assets as a significant determinant of becoming an early-moving firm towards the integrated reporting approach. Most scholars support that the more profitable a company is, the more likely it is to follow a voluntary disclosure policy providing supporting information of its good performance and success (Jensen & Berg, 2012; Frias-Aceituno et al., 2014; Buitendag et al., 2017). In this way, firm's chances to access funds at a lower cost can be improved. Thus, we control for the effect of a firm's performance by including a variable (*Profit*) measured by the return on assets (ROA) ratio. In our study we adopted the most commonly used definition of ROA being measured by net income before extraordinary items or preferred dividends scaled by total assets as in previous studies (Simnett et al, 2009; Caglio et al., 2019; Baboukardos & Copita, 2019). We adopt the approach of Jensen & Berg (2012) as depicted above and we predict that there will be a positive correlation between profitability and adoption of integrated reporting voluntarily.

Leverage

We control for the leverage effect by including in our model a relevant variable (*Leverage*) computed as total debt at the end of the fiscal year scaled by total assets at the same time period following similar studies (Baboukardos & Rimmel, 2016; Lopes, Oliveira & Coehlo, 2018; Bernardi & Stark, 2018; Hsiao et al., 2019). Theoretically, leveraged firms face increasing pressure from equity and debt holders to account for the use of received funds. In order to reduce information asymmetry, management tends to disclose a high quantity and variety of financial and sustainability data (Barnea & Rubin, 2010) having a positive impact on the company's reporting choice towards integrated reporting. However, Lai et al. (2014) found that leverage does not provide significant explanatory evidence about adoption of IR practice, whereas Islam (2020) found that there is a negative association between leverage and disclosures of IR probably due to debtors' restrictions in the form of covenants. Following the findings of Lai et al. (2014) and Islam (2020) we expect a negative sign of leverage.

Growth prospects

Literature has indicated that growth opportunities affect an organization's decision about its corporate reporting form. In theory, higher growth companies are expected to disclose voluntarily information as a signaling mechanism for distinguishing themselves from the remaining competitors and as a measure for reducing problems of information asymmetry (Frias-Aceituno et al., 2014; Chiara Mio, 2016; De Graaff & Steens, 2019; Girella et al., 2019). However, it is interesting to mention that archival studies have found no significant relationship between growth potentials and adoption of integrated reporting (García-Sánchez et al., 2013; Frias-Aceituno et al., 2014). In order to control for growth effects, we introduce in our model a variable (*Sales_growth*) defined as revenues' change on a year-to-year basis expressed in a percentage format. This variable is selected following past literature (Serafeim, 2015; Christensen, 2016). We adopt the viewpoint proposed by bibliography and we expect that sales growth will be positively linked to adoption of integrated reporting.

Liquidity

We control for liquidity effect by incorporating into our research model a variable (*CUR_ratio*) measured by the current ratio defined as current assets scaled by current liabilities. Management in companies, which have sufficient current assets and therefore, the ability to repay their short-term obligations, tends to be more willing to disclose a higher level of information (Elshandidy et al., 2013), which is in line with the integrated reporting approach. Therefore, we assume that there will be a positive relationship between integrated reporting adoption and a firm's liquidity.

Audit Committee

Audit committee's role is vital to ensuring the effectiveness of corporate governance mechanism within enterprises (Cohen, Hoitash, Krishnamoorthy, & Wright, 2014). Its main responsibility is to monitor organizations' financial reporting and audit process, internal controls' system, compliance with laws and regulations, and adherence to established ethical principles and standards (Al-Baidhani, 2014). Prior studies, albeit limited, have pointed out that audit committees' function expands also to risk management and non-financial disclosures with positive impact on their quality (Li et al., 2012; Ahmed Haji, 2015; Martinov-Bennie et al., 2015). Integrated reporting intends to bridge the information gap between different categories of stakeholders and act as an effective communication tool providing a true and fair complete view of companies. Thus, the existence of an audit committee within firms is anticipated to be in favor of adopting integrated reporting as corporate reporting practice, since it can effectively assist firm's board of directors in implementing and supervising the integrated reporting policy (Rodrigue et al., 2013).

Empirical research examining the impact of firms' audit committees in non-financial disclosures is fragmented (Ho and Wong, 2001; Akhtaruddin and Haron, 2010; Li et al., 2012; Ahmed Haji, 2015). So far, it has highlighted that the existence and function of an audit committee within corporations are positively associated with the quality and extent of non-financial disclosures (Ho and Wong, 2001; Demartini and Trucco, 2017). In the context of integrated reporting, Ahmed Haji and Anifowose (2016) examining the trend of IR in a sample of South African enterprises found that the overall effectiveness of the audit committee function has a strong positive association with the amount of information contained in integrated reports and with reports' alignment with the IIRC Framework. Additionally, Velte (2018) highlighted that the expertise of the audit committee, especially in financial and sustainability issues, can enhance the level of readability of integrated reports. In the European Union, part of which is the Eurozone, the existence of an audit committee is compulsory for publicly listed companies based on EU Directive 2006/43/EC. Therefore, we control for the existence of an audit committee introducing a binary variable taking the value of one in case an audit committee exists and the value of zero, otherwise. Based on the aforementioned reasoning, we expect that audit committee existence and adoption of integrated reporting will be positively related.

Corporate Social Responsibility Reporting

According to bibliography, CSR practices support corporations in their task to narrate to the public their impact on communities and society and explain how CSR integrates stakeholders' goals with firms' long-term performance (Hooghiemstra, 2000; Martin et al., 2009). Past empirical research has indicated that companies, which already prepare and publish CSR reports are more likely to adopt an integrated reporting approach (Jensen &

Berg, 2012; Frias-Aceituno et al., 2013; Lueg et al., 2016). Companies view transition to IR as a chance to combine separate sub-reports and focus on material reporting issues enhancing stakeholders' decision-making (Lueg et al., 2016). In addition to the above, Ahmed Haji and Anifowose (2016) suggested that firms with CSR committees in place have higher probability to practice IR in line with the IIRC Framework and include information content of higher quality. Therefore, we recognize the need to control for previous experience in corporate social responsibility by incorporating in our models a relevant variable (*CSR_Reporting*) transformed to a binary variable taking the value of one for companies that already practice CSR reporting and the value of zero, otherwise. Based on the aforementioned reasoning, we assume that a positive association between adoption of integrated reporting and application of CSR reporting will arise.

Environmental and Social Performance

A fraction of literature has analyzed the relationship between environmental, social and governance (ESG) performance and adoption of integrated reporting as well as their value relevance (Lai et al., 2014; Mervelskemper & Streit, 2017; Maniora 2017). Lai et al. (2014) found that firms' propensity to apply integrated reporting voluntarily is higher, when their ESG performance and the respective disclosure ratings are high. Moreover, Churet and Eccles (2014) identified a positive link between the overall quality of ESG management and integrated reporting. Finally, Arnold et al. (2012) proved that ESG performance is valued more strongly, when incorporated in an integrated report compared to a stand-alone report. Thus, we identify the necessity to control for the effect of ESG performance on adoption of the integrated reporting approach. Since we examine separately governance related factors as independent variables, we will control only for environmental and social performance by including in our models a relevant variable (*ES_Score*). For the measurement of this variable, we follow previous studies (Lys et al., 2015; Manning et al., 2019) and use an equally constructed measure of the Environment Pillar Score and the Social Pillar Score provided by ESG Refinitiv Database. Each pillar score takes values in the range 0-100, and thus, so does our variable (*ES_Score*). The higher the score, the better the firm's environmental and social performance. Based on the aforementioned reasoning, we expect a positive association to exist between adoption of integrated reporting and environmental and social performance.

3.5 Research Models

3.5.1 Association between corporate governance-related factors and voluntary adoption of integrated reporting

In order to examine the association between corporations' corporate governance characteristics and their decision to apply the integrated reporting approach, namely the

first three hypotheses formulated in Section 2.3, we estimate the following equation using a probit regression model for panel data:

$$\begin{aligned}
 IR_Adoption_{i,t} = Pr(& BoD_size_{i,t} + BoD_independence_{i,t} + BoD_diversity_{i,t} + AC_{i,t} \\
 & + CSR_Reporting_{i,t} + ES_Score_{i,t} + Size_{i,t} + Profit_{i,t} + Leverage_{i,t} \\
 & + Sales_growth_{i,t} + CUR_ratio_{i,t} + \sum YEAR_t + \sum INDUSTRY_i + e_{i,t})
 \end{aligned}
 \tag{1}$$

Moreover, we will estimate equation (2) after replacing in equation (1) the three individual corporate governance proxies of board size, board independence and board gender diversity with an overall corporate governance score as explained in Section 3.3.

$$\begin{aligned}
 IR_Adoption_{i,t} = Pr(& GOV_score_{i,t} + AC_{i,t} + CSR_Reporting_{i,t} + ES_Score_{i,t} + Size_{i,t} + Profit_{i,t} \\
 & + Leverage_{i,t} + Sales_growth_{i,t} + CUR_ratio_{i,t} + \sum YEAR_t + \sum INDUSTRY_i + h_{i,t})
 \end{aligned}
 \tag{2}$$

Following the vast majority of previous studies (Frías-Aceituno et al., 2014; Baboukardos & Rimmel, 2016; Bernardi & Stark, 2018; Obeng et al., 2021), we incorporate in all our models industry and year fixed effects in order to control for observable or unobservable characteristics related to certain industry sectors and time periods and reduce the threat of omitted-variable bias. For the purpose of controlling for industry effects, we use a multiple dummy variable ($\sum INDUSTRY_i$) derived from forty-eight industries identified by Fama and French (1997). Similarly, in order to control for year effects, we include a multiple dummy variable ($\sum YEAR_t$) taking the value of one for any firm-year observation with a financial year-end in calendar year t and the value of zero otherwise.

3.5.2 Association between voluntary integrated reporting adopting firms and market valuation

For the purpose of examining the relationship between integrated reporting adopting firms and market valuation, namely the fourth hypothesis developed earlier in Section 2.3, we adopt the Ohlson valuation model (Ohlson, 1995). The Ohlson model (1995) expresses the market value of equity as a function of firm's book value of equity, accounting earnings and other non-financial value-relevant information (De Klerk & De Villiers, 2012; Grassman, 2021) and according to the existing literature, it is assumed to be the standard approach for analyzing how financial and non-financial information are linked to market valuation (Berthelot et al., 2012; Semenova and Hassel, 2015; Lee et al., 2015).

There are three main assumptions, which underlie the original Ohlson model (1995). First, the market value is assumed to be equal to the discounted present value of expected future dividends using a constant discount rate. Secondly, the clean surplus relation of accounting,

which is defined as $BV_t = BV_{t-1} + NI_t - Div_t$, where $BV_{i,t}$ represents the book value of equity at time t , $BV_{i,t-1}$ the opening book value of equity at period t , $NI_{i,t}$ the net income during period t and $Div_{i,t}$ the dividends distributed during period t , holds. Thirdly, abnormal earnings and other non-financial information follow a first-order auto-regressive process.

Based on the above, the Ohlson model (1995) is specified in its original form as follows:

$$MV_{i,t} = a_0 * BV_{i,t} + a_1 * AE_{i,t} + a_2 * v_{i,t} + e_{i,t}$$

where $MV_{i,t}$ is firm's market value of equity at time t , $BV_{i,t}$ represents the book value of equity at time t , $AE_{i,t}$ refers to abnormal earnings during period t and $v_{i,t}$ captures non-financial information at time t . According to Ohlson (1995), abnormal earnings are calculated as the difference between net income for period t and opening book value of equity multiplied by the respective required rate of return. Criticism was exercised to the original Ohlson model (1995) mostly due to the fact that the rate of return usually cannot be easily obtained and there is no generally accepted method for calculating it resulting in difficulties to estimate abnormal earnings (De Klerk & De Villiers, 2012). Therefore, based on the abovementioned three assumptions on which the model is based, Collins et al. (1999) and Lin and Walker (2000) developed a restated version of the initial Ohlson model as follows:

$$MV_{i,t} + Div_{i,t} = \beta_0 + \beta_1 * BV_{i,t-1} + \beta_2 * NI_{i,t} + \beta_3 * v_{i,t} + \varepsilon_{i,t}$$

where $MV_{i,t} + Div_{i,t}$ reflects the cum-dividend adjusted market value, $BV_{i,t-1}$ stands for the opening book value of equity at period t and $NI_{i,t}$ is the net income after tax available to common shareholders during period t . All terms of the above equation except for the non-financial accounting information ($v_{i,t}$) can be deflated by the opening book value of equity so that potential heteroscedasticity issues arising from cross-sectional variations in firm size are mitigated (Rajgopal et al., 2003; Al Jifri and Citron, 2009; Barth and Clinch, 2009). After deflation with opening book value of equity the below modified model is derived:

$$\frac{MV_{i,t} + Div_{i,t}}{BV_{i,t-1}} = \beta_0 * \frac{1}{BV_{i,t-1}} + \beta_1 + \beta_2 * \frac{NI_{i,t}}{BV_{i,t-1}} + \beta_3 * v_{i,t} + u_{i,t}$$

This modified Ohlson model (1995) has been widely used by the accounting literature (Hassel et al., 2005; De Klerk & De Villiers, 2012; Mervelskemper and Streit, 2017; Landau et al., 2020) when examining how non-accounting information is linked to market valuation. Therefore, since we attempt to analyze a similar issue about how the integrated reporting approach, which captures except for financial also sustainability information, is associated to firms' market value, we selected to use this modified version of Ohlson model

(1995). Adjusting the modified Ohlson model (1995) for our own parameters of interest, we define our main research model as follows:

$$\frac{MV_{i,t} + Div_{i,t}}{BV_{i,t-1}} = \beta_0 * \frac{1}{BV_{i,t-1}} + \beta_1 + \beta_2 * \frac{NI_{i,t}}{BV_{i,t-1}} + \beta_3 * IR_Adoption_{i,t} + \sum YEAR_t + \sum INDUSTRY_i + v_{i,t} \quad (3)$$

Regarding the market value of equity, it is measured on the last calendar day of the first quarter of each calendar year in order to account for the time lag between the fiscal year-end and the public release of annual reports and thus, investors' reactions (De Klerk & De Villiers, 2012; Mervelskemper and Streit, 2017; Cortesi and Vena, 2019). In order to include other non-accounting information into our model, we use the variable *IR_Adoption_{i,t}*, defined as a binary variable taking the value of one for integrated reporting adopting firms and the value of zero, otherwise. Additionally, we use industry and time fixed effects as analyzed in Section 3.5.1 above.

3.5.3 Heckman two-stage model

For estimating the regression of equation (3) as defined above in Section 3.5.2, we employ a Heckman two-stage model following Maniora (2017), Zhou et al. (2017), Hsiao et al. (2019) and Obeng et al. (2021). The Heckman-two stage approach (Heckman, 1976) is a statistical solution to sample selection bias, which can arise when the sample is non-randomly obtained from a population or when the dependent variables are incidentally truncated. According to Tucker (2010), this model can also be used to rule out selection bias arising from unobservable characteristics like firms' culture and internal changes. With respect to adoption of the integrated reporting approach in voluntary regimes, where corporations have flexibility in selecting to publish or not integrated reports based on factors interconnected with capital market consequences, a Heckman-two stage selection model best addresses the self-selection bias (De Villiers et al., 2017). Otherwise, the estimated coefficients of the independent variables can be biased.

The Heckman two-stage model functions as follows. During the first stage, the Heckman model estimates a probit selection model. Specifically, in our study the probit selection model is used to predict how various factors including firm-specific characteristics, corporate governance system, environmental and social performance and CSR experience affect organizations' decision to issue or not an integrated report. Our probit selection model is defined as the model of equation (1) set out in Section 3.5.1 and is presented below.

$$IR_Adoption_{i,t} = Pr(BoD_size_{i,t} + BoD_independence_{i,t} + BoD_diversity_{i,t} + AC_{i,t} + CSR_Reporting_{i,t} + ES_Score_{i,t} + Size_{i,t} + Profit_{i,t} + Leverage_{i,t} + Sales_growth_{i,t} + CUR_ratio_{i,t} + \sum YEAR_t + \sum INDUSTRY_i + e_{i,t})$$

During the second stage, the Heckman model uses the correction factor, known as “lambda” or “Inverse Mills Ratio” (IMR), calculated from the previous probit selection model as an additional control variable of the main regression of interest². A statistically significant IMR indicates that selection bias existed that could distort the actual results. With the inclusion of the Inverse Mills Ratio into the main regression of interest, the model rectifies for any selection bias, and permits the estimation of the main regression to be performed through an Ordinary Least Squares (OLS) model without inaccuracies.

The main regression of interest for our study is equation (3) set out in Section 3.5.2 being also specified below:

$$\frac{MV_{i,t} + Div_{i,t}}{BV_{i,t-1}} = \beta_0 * \frac{1}{BV_{i,t-1}} + \beta_1 + \beta_2 * \frac{NI_{i,t}}{BV_{i,t-1}} + \beta_3 * IR_Adoption_{i,t} + \sum YEAR_t + \sum INDUSTRY_i + v_{i,t}$$

Summarizing below are the dependent, independent and control variables included in our research models alongside with the Refinitiv symbol in parenthesis. A detailed description of the Refinitiv data items is presented in the Appendix.

Table A: Summary of variables used in regression models

Variable name	Description
IR_Adoption _{i,t}	Binary variable taking the value of one for “Yes” referring to firms using integrated reporting and the value of zero for “No” referring to firms not practicing integrated reporting based on the item “Integrated Strategy in MD&A” (CGVSDP018).
BoD_size _{i,t}	The total number of board members at the end of each fiscal year (CGBSDP060).
BoD_independence _{i,t}	The percentage of non-executive board members for each fiscal year (CGBSO06V).
BoD_diversity _{i,t}	The percentage of female directors on the board for each fiscal year (CGBSO03V).
Size _{i,t}	The natural logarithm of total assets (WC02999).
Profit _{i,t}	The net income before extra items/preferred dividends (WC01551) scaled by total assets (WC02999).
Leverage _{i,t}	The total debt (WC03255) scaled by total assets (WC02999).
Sales_growth _{i,t}	The percentage change of net sales/revenues (WC01001) on a year-to-year basis.

² The inverse Mills ratio is estimated as, $\phi(z)/\Phi(z)$ where z is the fitted value of the probit regression index function; ϕ is the density function for standard normal distribution; and Φ is the cumulative density function for a standard normal distribution.

Variable name	Description
$CUR_ratio_{i,t}$	Current assets scaled by short-term liabilities (WC08106).
$AC_{i,t}$	Binary variable taking the value of one for “Yes” indicating existence of an audit committee and the value of zero for “No” indicating such a committee does not exist based on the item “Audit Board Committee” (ECSLDP005).
$CSR_Reporting_{i,t}$	Binary variable taking the value of one for “Yes” indicating firms are practicing corporate social responsibility reporting and the value of zero otherwise based on the item “Corporate Social Responsibility Reporting” (CGVSDP026).
$ES_Score_{i,t}$	The mean of the Environmental Pillar Score (ENSCORE) and the Social Pillar Score (SOSCORE).
$GOV_Score_{i,t}$	The score provided by the Governance Pillar Score (CGSCORE).
$MV_{i,t}$	The market value of equity (MV).
$Div_{i,t}$	The total cash dividends paid in a fiscal year (WC04551).
$BV_{i,t}$	The book value of total shareholders’ equity (WC03995).
$NI_{i,t}$	The net income available to common shareholders during period t (WC01751).

Subscripts i and t denote firm i and year t respectively.

4. Empirical Findings

4.1 Descriptive Statistics and Correlations

Table 2 presents the descriptive statistics for the basic variables used in regressions to estimate the research models set out previously in Section 3.5. More specifically, the descriptive statistics present the number of firm-year observations (N), the mean, the standard deviation, the first, second and third quartiles ($Q1$, median, $Q3$ respectively), the minimum and the maximum values. Panel A presents the above descriptive statistics for the entire sample, whereas Panel B and Panel C depict such figures for firms following or not the integrated reporting approach respectively.

It is worthwhile to mention that from the total sample of 6,510 firm-year observations, available data regarding integrated reporting adoption existed for 2,140 observations. From the 2,140 observations almost 60.98%, namely 1,305 observations, refer to firms using the integrated reporting approach, while the remaining 39.02%, namely 835 observations, refer to firms not following the integrated reporting method. Observations finally used in regressions equal to 2,092 for equations (1) and (3) and 2,064 for equation (2).

With respect to the three proxies of board size, board independence and board gender diversity, which were used for measuring the corporate governance quality within firms, we observe the following. Board size ranges between 2 and 26 members with an average of 11.5 members being relatively stable for both IR adopting and remaining firms consistently with Alfiero et al. (2017), Vitolla et al. (2019) and Songini et al. (2022) despite the fact that Vitolla et al. and Songini et al. examined international samples. Concerning the presence of independent non-executive directors, our proxy takes values from 29% to 100% with a mean of 90% for the entire sample, which is higher than the respective measure of 50.37% reported by Songini et al. (2022). When examining the aforementioned ratio for integrated reporting adopting and non-adopting firms, we note that it is higher for the first category of firms (92% against 88%). Additionally, female directors in boards are found to represent 25% of the total board members with the ratio being held at the same level for firms following or not an integrated reporting approach. This figure is close enough to the rate of 24% and 21.53% found by Vitolla et al. (2019) and Songini et al. (2022) respectively, whereas it is significantly above the rate (6.47%) found by Girella et al. (2019). The alternative variable used in equation (2) as an overall measure of firms' corporate governance performance, namely the Governance Pillar Score, has a mean and a median value of 55.27 and 56.32 respectively. During the analysis of firms using or not an integrated reporting method, we find that firms that follow integrated reporting have a mean of 58.25 and a median of 59.87 compared to a mean of 50.62 and a median of 51.19 for those that do not. Overall, the above statistics provide a first sign that firms practicing integrated reporting have better corporate governance systems.

It is also worth noting that consistently with our expectations, integrated reporting adopting firms have better environmental and social performance (64.21 against 56.29) in a scale of 0-100 according to ESG database. Moreover, 95% of the integrated reporting adopting corporations has experience in Corporate Social Responsibility reporting in line with Frías-Aceituno et al. (2014) and Ahmed Haji & Anifowose (2016) and 97% has an active audit committee. The respective percentages of firms not following an integrated reporting approach are lower. Regarding the remaining control variables, the long-term debt amounts on average to 28% of total assets, the annual net income is on average 3% of total assets, the annual growth rate and the current ratio are on average 6% and 1.56 respectively when it comes to the entire sample. Those measures indicate that the majority of sample firms has a good financial performance.

Concerning the variables of equation (3) used to examine the association between voluntary application of integrated reporting approach and market value, we observe that integrated reporting adopting firms have a mean market value of €12.1 billion being €2.5 billion higher than the respective average market value of remaining firms. Book values of equity, annual net income available to shareholders and distributed cash dividends have higher mean and median values for firms practicing an integrated reporting disclosure type.

Insert Table 2 here

Table 3 reports the pair-wise correlation coefficients with the corresponding statistical significance among the main variables of equations (1) and (2) (Panel A) and among the main variables of equation (3) (Panel B). Among the independent variables of equation (1) the highest correlation coefficient is 0.11 between board size and board independence. At this point, it should be mentioned that board gender diversity is insignificantly correlated with the dependent variable of integrated reporting adoption as well as with the remaining independent variables. The integrated reporting adoption proxy is found to be significantly and positively correlated with the existence of an audit committee, the release of CSR reports and firm's performance towards environment and society indicating that their selection as control variables was appropriate. Concerning the remaining control variables of firm size, profitability and leverage, these are also significantly correlated with integrated reporting adoption proxy implying that they may act as determinants of the adoption. Regarding the dependent and independent variables of equation (3) of the modified Ohlson model (1995), namely the book value of equity, the market value of equity, the net income and distributed dividends, they are positively and significantly correlated as expected (De Villiers and Marques, 2016).

Insert Table 3 here

In addition to the above, we performed skewness and kurtosis tests of our data and no relative evidence was found. Thus, we consider our data to follow normal distribution. Moreover, before proceeding to regressions we also performed unit root tests for the continuous variables included into our research models except for the case they represented ESG metrics.

4.2 Empirical results about Corporate Governance and voluntary adoption of integrated reporting approach

4.2.1 Probit model regression results

Table 4 illustrates the results of the estimated equations (1) and (2) concerning firms' corporate governance quality and their decision to implement the integrated reporting approach voluntarily.

In equation (1) we ran a probit regression model, where the integrated reporting adoption proxy was used as the dependent variable and board size, board independence and board diversity were used as the independent variables. We provide evidence that there is a strong relationship among these variables. More specifically, board size and independence are positively associated with enterprises' choice of following an integrated reporting approach

(at significance level 5% and 1% respectively) consistently with our expectations, the stakeholder theory and the existing empirical research (Frías-Aceituno et al., 2013; Zambon et al., 2019; Vitolla et al., 2020a; Vitolla et al., 2020b). On the other hand, it is notable that board gender diversity is significantly and negatively associated with corporations' decision to apply integrated reporting (at significance level 1%) in contrast with our expectations and the majority of the existing literature (Frías-Aceituno et al., 2012; Alfiero et al., 2017; Girella et al., 2019). One possible explanation for this negative association may be grounded on legitimacy theory, which suggests that firms disclose voluntary information to build their reputation as socially responsible and legitimize their actions to stakeholders (Suchman, 1995; Windolphet al., 2014). Accordingly, firms may appoint women on board as a signal to the public that they follow best corporate governance practices without first ensuring that those female directors have the appropriate competences, skills and knowledge. In this way, their presence cannot contribute to firms' disclosure practices. Another possible explanation may be provided by the Token Theory (Kanter, 1977b), which suggests that social minority groups, like women on board, may face pressure from dominant social groups, namely the remaining board members, limiting their contribution to board decision-making process. It is worthwhile to mention that a fraction of previous studies have also found a negative relationship between integrated reporting and board gender diversity (Fasan & Mio, 2017; Pistoni et al, 2022).

Based on the aforementioned, we can reasonably say that large boards consisting of more independent directors and less women act in favor of the adoption of integrated reporting supporting our first two hypotheses and rejecting our third hypothesis set out in Section 2.3.

The same positive association between firms' corporate governance quality and their decision to use an integrated reporting approach is also supported by the results of the probit model regression used to estimate equation (2), where the three distinct proxies of corporate governance-related factors were replaced by an overall corporate governance measure. A positive and significant association (at 1% significance level) was found between those corroborating our expectations that corporate governance acts as a determinant of organizations' option to choose the integrated reporting approach.

Furthermore, under both regressions the existence of an audit committee was found to be insignificantly associated to integrated reporting adoption, whereas firms' performance towards the society and the environment, the release of CSR reports and firm size were found to be positively and significantly (at 1% and 5% significance level) associated to practice of IR. From the remaining control variables, only leverage and current ratio were found to be significantly positively and negatively respectively associated to adoption of integrated reporting at significance level of 10%.

Insert Table 4 here

4.2.2 Robustness controls

In order to ensure robustness of the results arising from equations (1) and (2) we estimated equation (1) using a one-year time lag in independent variables and the respective controls retaining industry and time fixed effects. Results are presented in Table 5 providing evidence that board independence and board gender diversity remained significantly (positively and negatively respectively) associated with the decision to follow the integrated reporting approach at significance level 1%. Thus, the results of equation (1) are strengthened. Interestingly, board size changed from being significantly associated with the adoption of integrated reporting approach at significance level 5% in our main analysis to being insignificantly associated with this option in the lagged version of equation (1) indicating that this variable is more sensitive to changes. Regarding the association among adoption of integrated reporting and the existence of an audit committee, the practice of CSR reporting, corporations' environmental and social performance and firm size, results did not change under the lagged model of equation (1).

Insert Table 5 here

4.3 Empirical results about voluntary adoption of integrated reporting approach and market valuation

Table 6 presents the results of the Heckman two-stage model. More analytically, Panel A illustrates the results of the probit selection model in the first stage and Panel B depicts the results of the main regression (Equation 3) in the second stage.

Regarding the results of the first-stage probit selection model, they are the same as in Section 4.2.1, since the same equation has been used for the regression. In summary, we observe a statistically significant relationship among adoption of the integrated reporting approach (the dependent variable), board gender diversity, board independence, CSR reporting practice, environmental and social performance, firm size (at significance level 1%), board size (at significance level 5%) and current ratio (at significance level 10%).

High emphasis should be placed on the inverse Mills ratio, which was calculated through the probit selection model and was found to be statistically significant at significance level 1% (see Panel B). This provides an indication that selection bias exists, and highlights the appropriateness of the Heckman two-stage approach to correct it (Certo et al., 2016). The calculated Inverse Mills Ratio is, then, included in the second-stage model as a control variable fixing the issue. Otherwise, the results of the second-stage model would be incorrectly estimated resulting in misleading conclusions.

Concerning the results of the second-stage model, we observe that the use of the integrated reporting approach is positively and statistically significantly associated with market value adjusted for distributed dividends at a significance level 1%. This provides strong evidence that application of integrated reporting is assessed positively by the market participants leading in higher market values corroborating the findings of previous studies (Baboukardos & Rimmel, 2016; Mervelskemper & Streit, 2016; Arguelles et al., 2017;) and supporting the most prominent viewpoint that adoption of an integrated reporting method is value enhancing for firms. It seems that investors value the additional information and the insights provided through integrated reports relating to corporations' vision, strategy and business model, they consider firms following this reporting approach to be characterized by a high level of accountability and transparency and form high level expectations for the future being reflected in higher valuation. To avoid misunderstandings, we clarify at this point that the Stata software does not report a measure of adjusted R^2 in the second-stage of Heckman.

At last but not least, we would like to mention the measure of rho (equal to 0.47), that is reported in Panel B. Rho represents the correlation between the error terms of the selection probit equation and the main equation of the second-stage (Heckman, 1976). Its positive value indicates that the two error terms are positively associated and since its value is not zero, it strengthens the argument that the Heckman two-stage model was the appropriate statistical approach for the point under examination.

Insert Table 6 here

5. Conclusion

This dissertation examines two issues related to voluntarily adopting an integrated reporting approach in financial reporting for Eurozone firms during years 2007-2021. The first point under examination is the association existing between the quality of firms' corporate governance and their decision to voluntarily adopt an integrated reporting approach as a reporting method. The second point under examination is the relationship between implementation of such an integrated reporting approach and firms' market valuation.

Regarding the first point under examination, past literature and empirical research has indicated that corporations with high sense of accountability towards the various stakeholder groups, which tend to adhere to corporate governance best practices, are more willing to disclose voluntary information and adopt new reporting concepts towards this direction, such as the integrated reporting (Hichri, 2020, Vitolla et al. 2020). This is also consistent with the stakeholder theory (Freeman, 1984). Thus, it is supported that a positive relation between enterprises' level of corporate governance quality and the voluntary adoption of integrated reporting exists.

Concerning the second point under examination, past literature has highlighted that practicing an integrated reporting approach can be either value enhancing consistently with the IIRC (2013) or detrimental to firms consistently with the proprietary disclosure theory (Verrechia, 1983). The majority of past empirical research has provided evidence that the first viewpoint is most prominent, since the application of integrated reporting has been found to result in positive capital market implications like higher value-relevance of equity and earnings, lower cost of capital, increased market value, and higher liquidity (Baboukardos & Rimmel, 2016; Zhou et al., 2017; Lee & Yeo, 2016; Barth et al., 2017; Arguelles et al., 2017; Mervelskemper & Streit, 2017). Therefore, it is suggested that there is a positive relation between voluntary adoption of integrated reporting and firms' market valuation.

For our empirical analysis regarding the above two issues, we use a sample of 434 firms, which leads to 6,510 firm-year observations. From those, 2,092 firm-year observations are used in some regressions and 2,064 firm-year observations are used in the remaining regressions. We measure corporate governance through two different ways and estimate its impact on adoption of integrated reporting using probit regressing models. First, we measure it through three distinct governance-related factors, namely the board size, board independence and board gender diversity, following a significant fraction of archival studies (García-Sánchez et al., 2013; Frias-Aceituno et al., 2013; Alfiero et al., 2017; Girella et al., 2019; Vitolla et al., 2020). Secondly, we measure corporate governance through an overall governance score provided by the ESG Refinitiv database. Regarding the market valuation, we define our research model based on a restated version of the widely known and used by literature accounting valuation model of Ohlson (1995) consistently with Hassel et al. (2005), De Klerk & De Villiers (2012), Mervelskemper and Streit (2017) and Landau et al. (2020). This research model, which is estimated through a Heckman two-stage regression, includes the cum-dividend adjusted market value of firms, book values of equity, net income and distributed cash dividends.

Control variables relating to existence of an audit committee, previous experience with CSR reports, environmental and social performance, firm size, profitability leverage, growth prospects and current ratio have been included in all of our models alongside with industry and time fixed effects.

Our results provide evidence in support of a positive association between corporate governance quality and voluntary adoption of an integrated reporting approach demonstrating that stronger corporate governance mechanisms act in favor of adopting integrated reporting in line with our expectations and previous studies (Frias-Aceituno et al., 2013; Meniaoui et al., 2016; Stacchezzini et al., 2016; Alfiero et al., 2017; Fasan & Mio, 2017; Zambon et al., 2019; Vitolla et al., 2020). Moreover, our results exhibit a strong relationship between market valuation and use of integrated reporting indicating that

market benefits can be derived from this new reporting form. Such results are in accordance with our predictions and prior empirical research (Baboukardos & Rimmel, 2016; Lee & Yeo, 2016; Arguelles et al., 2017; Zhou et al., 2017; Barth et al., 2017).

Concluding on the above, we believe that our study provides useful contribution to the existing literature increasing the scope of voluntary application of the integrated reporting as well as some helpful insights to standard setters. Standard setters can become more deeply aware of how the corporate governance affects firms' decision to follow an integrated reporting approach and consider ways to further incentivize corporations for using this approach so that it becomes a business mainstream practice. Furthermore, from our analysis it can be inferred that market benefits found to arise from practicing an integrated reporting method under the mandatory setting of South Africa can be generalized also to the remaining jurisdictions with voluntary settings.

Tables

Table 1: Sample selection process and distributions by country and industry

Panel A: Sample selection process

	Number of firm observations
Total number of firm observations retrieved from Refinitiv database for the period 2007-2021	9,014
Less firm observations with no available data for application of IR for the entire period 2007-2021	(8,017)
Less duplicates	(388)
Less observations of cross-listed firms (more than one stock exchanges)	(152)
Less firm observations with a SIC code of categories 60-67	(10)
Less firm observations applying accounting standards other than IFRS	(7)
Less firm observations with negative book value of Equity	(4)
Less firm observations with no corresponding Fama-French 48 code	(2)
Final sample	434

* The firm-year observations used in regressions are not a perfect product of the number of firms multiplied by the number of years covered under the study due to adoption of IR approach by firms in different years.

Panel B: Country Distribution of sample's firms

Country	Number of firms	Percentage of sample
Germany	155	35.71%
France	94	21.66%
Italy	38	8.76%
Netherlands	31	7.14%
Finland	28	6.45%
Spain	27	6.22%
Belgium	23	5.30%
Austria	13	3.00%
Ireland	12	2.76%
Portugal	6	1.38%
Greece	3	0.69%
Luxembourg	3	0.69%
Malta	1	0.23%
TOTAL	434	100.00%

*No firms based in Cyprus, Estonia, Latvia, Lithuania, Slovakia and Slovenia, which are countries of the Eurozone, are included into our sample.

Panel C: Sample distribution in 48 industry classifications (Fama and French, 1997)

Industry type	Number of firms	Percentage of sample
Business Services	62	14.29%
Machinery	36	8.29%
Communication	27	6.22%
Electronic Equipment	25	5.76%
Retail	23	5.30%
Automobiles and Trucks	22	5.07%
Utilities	20	4.61%
Chemicals	20	4.61%
Pharmaceutical Products	18	4.15%
Petroleum and Natural Gas	15	3.46%
Wholesale	14	3.23%
Construction	13	3.00%
Transportation	13	3.00%
Construction Materials	12	2.76%
Consumer Goods	11	2.53%
Steel Works	10	2.30%
Computers	9	2.07%
Apparel	7	1.61%
Medical Equipment	7	1.61%
Rubber and Plastic Products	6	1.38%
Restaurants, Hotels, Motels	6	1.38%
Food Products	5	1.15%
Electrical Equipment	5	1.15%
Non-Metallic and Industrial Metal Mining	5	1.15%
Agriculture	4	0.92%
Entertainment	4	0.92%
Aircrafts	4	0.92%
Business Supplies	4	0.92%
Beer & Liquor	3	0.69%
Shipbuilding, Railroad Equipment	3	0.69%
Personal Services	3	0.69%
Shipping Containers	3	0.69%
Almost nothing	3	0.69%
Candy & Soda	2	0.46%
Recreation	2	0.46%
Printing and Publishing	2	0.46%
Healthcare	2	0.46%
Textiles	2	0.46%
Measuring and Control Equipment	1	0.23%
Fabricated Products	1	0.23%
TOTAL	434	100.00%

Table 2: Descriptive Statistics of basic variables used in regression equations**Panel A: Descriptive statistics for the entire sample (N=2,140)**

Variables	Q1	Mean	Median	Q3	Standard Deviation	Minimum value	Maximum value	N
IR_Adoption	0.00	0.61	1.00	1.00	0.49	0.00	1.00	2,140
BoD_size	8.00	11.50	11.00	14.00	4.65	2.00	26.00	2,125
BoD_independence	0.85	0.90	0.94	1.00	0.13	0.29	1.00	2,131
BoD_diversity	0.14	0.25	0.25	0.35	0.15	0.00	0.60	2,122
AC	1.00	0.96	1.00	1.00	0.19	0.00	1.00	2,125
CSR_Reporting	1.00	0.90	1.00	1.00	0.29	0.00	1.00	2,111
ES_Score	45.08	61.12	64.18	79.32	21.71	1.92	97.33	2,125
Size	21.25	22.44	22.46	23.65	1.70	17.17	25.85	2,138
Profit	0.01	0.03	0.04	0.06	0.18	-3.00	5.47	2,138
Leverage	0.15	0.28	0.26	0.38	0.17	0.07	1.26	2,138
Sales_growth	-0.04	0.06	0.04	0.11	0.40	-1.00	10.03	2,132
CUR_ratio	1.00	1.56	1.32	1.77	0.93	0.59	6.66	2,137
GOV_Score	39.01	55.27	56.32	72.63	21.99	2.33	98.30	2,125
BV*	608.51	6,257.34	1,837.30	5,598.05	12,791.08	317.90	109,118.00	2,140
MV*	1,198.31	11,102.05	3,739.62	10,841.82	19,548.29	683.37	147,813.70	2,140
NI*	18.88	595.43	143.30	551.25	1,801.74	-8,652.00	14,843.00	2,140
Div*	24.48	345.91	64.00	275.01	765.73	24.48	8,142.15	2,140

*Descriptive statistics for variables BV, MV, NI, Div are expressed in millions of Euros.

Panel B: Descriptive statistics for firms following the integrated reporting approach (N=1,305)

Variables	Q1	Mean	Median	Q3	Standard Deviation	Minimum value	Maximum value	N
BoD_size	8.00	11.80	12.00	16.00	4.94	2.00	26.00	1,295
BoD_independence	0.86	0.92	1.00	1.00	0.12	0.29	1.00	1,303
BoD_diversity	0.16	0.25	0.25	0.33	0.14	0.00	0.60	1,293
AC	1.00	0.97	1.00	1.00	0.17	0.00	1.00	1,295
CSR_Reporting	1.00	0.95	1.00	1.00	0.22	0.00	1.00	1,295
ES_Score	49.58	64.21	66.42	81.65	19.84	5.96	96.67	1,295
Size	21.38	22.55	22.53	23.83	1.68	17.17	25.85	1,304
Profit	0.01	0.04	0.04	0.06	0.18	-1.54	5.47	1,304
Leverage	0.16	0.28	0.25	0.37	0.16	0.07	1.26	1,304
Sales_growth	-0.03	0.05	0.04	0.11	0.34	-1.00	10.03	1,304
CUR_ratio	1.04	1.55	1.33	1.77	0.85	0.59	6.66	1,303
GOV_Score	42.31	58.25	59.87	75.33	21.74	3.51	98.30	1,295
BV*	736.25	6,799.12	1,885.00	6,251.00	13,498.16	317.90	109,118.00	1,305
MV*	1,253.32	12,111.65	3,876.00	12,532.11	20,209.55	683.37	174,003.40	1,305
NI*	27.00	684.20	158.67	628.78	1,937.90	-8,652.00	14,843.00	1,305
Div*	24.48	378.43	73.13	315.00	771.45	24.48	7,567.00	1,305

*Descriptive statistics for variables BV, MV, NI, Div are expressed in millions of Euros.

Table 2: Descriptive Statistics of basic variables used in regression equations**Panel C: Descriptive statistics for firms not following the integrated reporting approach (N=835)**

Variables	Q1	Mean	Median	Q3	Standard Deviation	Minimum value	Maximum value	N
BoD_size	8.00	11.02	11.00	13.00	4.12	3.00	26.00	830
BoD_independence	0.83	0.88	0.92	1.00	0.14	0.33	1.00	828
BoD_diversity	0.11	0.25	0.25	0.38	0.16	0.00	0.60	829
AC	1.00	0.95	1.00	1.00	0.21	0.00	1.00	830
CSR_Reporting	1.00	0.83	1.00	1.00	0.38	0.00	1.00	816
ES_Score	38.32	56.29	59.51	76.08	23.55	1.92	97.33	830
Size	21.08	22.27	22.31	23.30	1.72	17.82	25.85	834
Profit	0.01	0.02	0.03	0.06	0.17	-3.00	0.94	834
Leverage	0.14	0.29	0.26	0.41	0.18	0.07	1.14	834
Sales_growth	-0.04	0.07	0.04	0.12	0.48	-1.00	10.03	828
CUR_ratio	0.95	1.56	1.30	1.76	1.05	0.59	6.66	834
GOV_Score	33.00	50.62	51.19	67.92	21.56	2.33	95.27	830
BV*	458.07	5,410.59	1,734.46	4,568.65	11,549.22	317.90	100,838.08	835
MV*	1,035.38	9,618.27	3,579.00	9,364.62	19,116.61	683.37	174,003.40	835
NI*	9.37	456.70	124.06	434.00	1,555.29	-7,204.32	13,210.00	835
Div*	24.48	295.08	48.70	212.75	753.90	24.48	8,142.15	835

**Descriptive statistics for variables BV, MV, NI, Div are expressed in millions of Euros.*

Table 3: Pairwise Correlation Coefficients for baseline model variables

Panel A: Variables of Equation (1) & (2)

	IR_ Adoption	BoD_ size	BoD_ independence	BoD_ diversity	AC	CSR_ Reporting	ES_ Score	Size	Profit	Leverage	Sales_ growth	CUR_ ratio	GOV_ Score
IR_ Adoption	1.00												
BoD_ Size	0.08***	1.00											
BoD_ independence	0.14***	0.11***	1.00										
BoD_ diversity	0.01	-0.03	-0.01	1.00									
AC	0.05**	0.17***	-0.00	0.04***	1.00								
CSR_ Reporting	0.20***	0.14***	0.02	0.23***	0.13***	1.00							
ES_ Score	0.18***	0.35***	0.07***	0.29***	0.20***	0.56***	1.00						
Size	0.08***	0.57***	0.14***	0.05***	0.24***	0.28***	0.62***	1.00					
Profit	0.04**	-0.03*	0.02	-0.02	0.04**	0.03*	0.02	0.06***	1.00				
Leverage	-0.04*	0.06***	-0.13**	-0.01	0.05***	0.01	0.01	0.14***	-0.04***	1.00			
Sales_ growth	-0.03	-0.06***	-0.04**	-0.01	-0.01	-0.04**	-0.08***	-0.10***	0.01	-0.05***	1.00		
CUR_ Ratio	-0.03	-0.23***	0.04**	-0.02	-0.07***	-0.11***	-0.17***	-0.35***	-0.02	-0.30***	0.13***	1.00	
GOV_ Score	0.17***	0.07***	0.17***	0.24***	0.16***	0.29***	0.45***	0.34***	-0.01	0.04**	-0.03**	-0.03*	1.00

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

Table 3: Pairwise Correlation Coefficients for baseline model variables**Panel B: Variables of Equation (3)**

	IR_Adoption	BV	MV	NI	Div
IR_Adoption	1.00				
BV	0.06***	1.00			
MV	0.05**	0.78***	1.00		
NI	0.06***	0.68***	0.72***	1.00	
Div	0.05**	0.80***	0.78***	0.67***	1.00

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

Table 4: Probit model regression results

		<i>Equation (1)</i>	<i>Equation (2)</i>
	Expected Sign	IR_Adoption_{i,t} Coefficient (t-stat)	IR_Adoption_{i,t} Coefficient (t-stat)
BoD_size_{i,t}	+	0.19 (2.00)**	-
BoD_independence_{i,t}	+	1.53 (5.67)***	-
BoD_diversity_{i,t}	+	- 1.46 (-5.30)***	-
AC_{i,t}	+	0.06 (0.03)	0.09 (-0.51)
CSR_Reporting_{i,t}	+	0.58 (4.70)***	0.53 (4.37)***
ES_Score_{i,t}	+	0.01 (4.74)***	0.08 (3.34)***
GOV_Score_{i,t}	+	-	0.01 (3.34)***
Size_{i,t}	+	-0.10 (-2.93)***	-0.06 (-2.18)**
Profit_{i,t}	+	-0.32 (-1.00)	-0.24 (-0.77)
Leverage_{i,t}	-	-0.22 (-0.99)	0.36 (-1.66)*
Sales_growth_{i,t}	+	-0.05 (-0.60)	-0.09 (-1.01)
CUR_ratio_{i,t}	+	-0.07 (-1.88)*	-0.04 (-0.97)
Constant		0.62 (0.95)	1.11 (1.85)*
Year-fixed effects		Yes	Yes
Industry-fixed effects		Yes	Yes
No. of observations		2,092	2,064
Wald chi²		469.91	343.37
Pseudo R²		16.86%	13.07%

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

Table 5: Robustness controls of probit model regression results

	Expected Sign	IR_Adoption_{i,t} Coefficient (t-stat)
		0.01 (1.30)
BoD_size_{i,t-1}	+	1.75 (5.93)***
BoD_independence_{i,t-1}	+	-1.51 (-4.87)***
BoD_diversity_{i,t-1}	+	-0.29 (-1.30)
AC_{i,t-1}	+	0.47 (3.80)***
CSR_Reporting_{i,t-1}	+	0.01 (3.92)***
ES_Score_{i,t-1}	+	-0.09 (-2.69)***
Size_{i,t-1}	+	-0.25 (-0.66)
Profit_{i,t-1}	+	-0.19 (-0.81)
Leverage_{i,t-1}	-	0.01 (0.15)
Sales_growth_{i,t-1}	+	-0.07 (-1.77)*
CUR_ratio_{i,t-1}	+	0.90 (1.26)
Constant		Yes
Year-fixed effects		Yes
Industry-fixed effects		Yes
No. of observations		1,882
Wald chi²		361.59
Pseudo R²		15.66%

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

Table 6: Heckman two-stage model results**Panel A: Probit selection model results (First stage)**

	IR_Adoption_{i,t} Coefficient (t-stat)
	0.19 (2.00)**
BoD_size_{i,t}	1.53 (5.67)***
BoD_independence_{i,t}	- 1.46 (-5.30)***
BoD_diversity_{i,t}	0.06 (0.03)
AC_{i,t}	0.58 (4.70)***
CSR_Reporting_{i,t}	0.01 (4.74)***
ES_Score_{i,t}	-0.10 (-2.93)***
Size_{i,t}	-0.32 (-1.00)
Profit_{i,t}	-0.22 (-0.99)
Leverage_{i,t}	-0.05 (-0.60)
Sales_growth_{i,t}	-0.07 (-1.88)*
CUR_ratio_{i,t}	0.62 (0.95)
Constant	Yes
Year-fixed effects	Yes
Industry-fixed effects	Yes
No. of observations	2,092
Wald chi²	469.91
Pseudo R²	16.86%

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

Table 6: Heckman two-stage model results**Panel B: Estimation results of the restated Ohlson model (Second stage)**

	Expected Sign	<i>Equation (3)</i> $\frac{MV_{i,t} + Div_{i,t}}{BV_{i,t-1}}$ Coefficient (t-stat)
IR_Adoption_{i,t}	+	3.26 (9.51)***
$\frac{NI_{i,t}}{BV_{i,t-1}}$		0.14 (0.76)
Inverse Mills Ratio		1.06 (2.85)***
Rho		0.47
Year-fixed effects		Yes
Industry-fixed effects		Yes
No. of observations		2,092
Wald chi²		292.94

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

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Appendix

This appendix contains used data items of Refinitiv Database alongside with their symbols and the respective definitions.

Name	Symbol (Type)	Description
SIC Code	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. They are derived from the 1987 edition of the Standard Industrial Classification Manual compiled by the Executive Office of the President of the United States, Office of Management and Budget. 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	WC07536 (Worldscope)	Identifies the GAAP standards followed.
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.
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.

Name	Symbol (Type)	Description
Total Debt	WC03255 (Worldscope)	Represents all interesting bearing and capitalized lease obligations. It is the sum of long term and short term debt.
Net Sales or Revenues	WC01001 (Worldscope)	Represent gross sales and other operating revenue less discounts, returns and allowances.
Current Ratio	WC08106 (Worldscope)	Represents total current assets as a percentage of total current liabilities.
Total Shareholders Equity	WC03995 (Worldscope)	Represents the sum of Preferred Stock and Common Shareholders' Equity.
Net Income Available To Common Shareholders	WC01751 (Worldscope)	Represents the net income the company uses to calculate its earnings per share. It is before extraordinary items.
Market Value	MV (Datastream)	Expresses the share price multiplied by the number of ordinary shares in issue.
Cash Dividends Paid	WC04551 (Worldscope)	Represent the total common and preferred dividends paid to shareholders of the company. It excludes dividends paid to minority shareholders.
Integrated Strategy in MD&A	CGVSDP018 (ESG)	Does the company explicitly integrate financial and extra-financial factors in its management discussion and analysis (MD&A) section in the annual report?
CSR Sustainability Reporting	CGVSDP026 (ESG)	Does the company publish a separate sustainability report or publish a section in its annual report on sustainability?
Board Size	CGBSDP060 (ESG)	The total number of board members at the end of the fiscal year.
Non-Executive Board Members	CGBSO06V (ESG)	Percentage of non-executive board members.
Board Gender Diversity, Percent	CGBSO03V (ESG)	Percentage of female on the board.
Audit Board Committee	ECSLDP005 (ESG)	Does the company have an audit committee?
Governance Pillar Score	CGSCORE (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

Name	Symbol (Type)	Description
		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.
Environment Pillar Score	ENSCORE (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.
Social Pillar Score	SOSCORE (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.