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Integrated Reporting and IFRS 3: an empirical study to Cost of Equity through Firm Risk and Investor Protection

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Abstract

This study examines the relation of cost of equity associated with the disclosure quality of IFRS 3 and the Integrated Reporting (IR) compliance. Employing an IR sample composed of 498 non-financial firms that use IR either mandatorily or voluntarily from 2011 to 2019, we investigate the impact of IR and IFRS 3 disclosure quality on the cost of equity. Based on Breuer et al. (2018) and Chava (2014) we suggest two distinct channels through which IR and IFRS 3 can influence the cost of equity: firm risk and investor base. In companies with strong legal, cultural, and political factors, our results show that the cost of equity falls when a firm invests in IR and at the same time provides high levels of IFRS 3 information. Moreover, we find that higher IFRS 3 disclosure score lowers firms' risk in companies with high IR compliance. We interpret the negative relation at higher levels of disclosure as evidence that investors consider firms with low levels of IR informativeness to be riskier. Finally, we find that the negative impact of IFRS 3 disclosure quality and of IR compliance to cost of equity is more intense when firms' risk is low.

JEL Classification: C 33; G17; G32; L2; M14.

Keywords: integrated reporting, IFRS 3, accounting disclosure quality, cost of equity, firm risk and investor protection

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1 Introduction

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Financial reports serve the fundamental notion of providing information about the financial situation of economic entities covering various aspects and, thus, they influence capital allocation and credit decisions and provide information of the prospects of a company such as income/revenue, costs/expenses, assets, liabilities and cash flows. As a result, the health of the accounting system influences the health of the economy and the distribution of wealth and income therein (Cooper, 2015).

In recent years, there is a tendency for firms to provide a high disclosure quality of financial and non-financial information under an integrated reporting (IR) regime (International Integrated Reporting Council (IIRC), 2013). The main role of IR is to explain to providers of financial capital how an organization creates value over time (IIRC, 2013). The IIRC Framework (2013) represents a new idea: merging in one document the financial statements presented in an annual report with a separate, mostly voluntary stand-alone sustainability or Corporate Social Responsibility (CSR) report. By merging financial and non-financial information, IR solves a number of problems relating to resource allocation that a firm uses to create value (Caglio et al, 2020). The importance of this new reporting approach derives from the mandatory disclosure of non-financial information in South Africa by publishing an annual integrated report and from the voluntary adoption of IR in several other countries (e.g., Europe, US, Japan, and India) in order to provide an innovative reporting system that enhances transparency.

In our study parallel to IR regime, we concentrate on firm's disclosures associated to business combinations and impairment testing of goodwill. The IFRS regime for business combinations and for the impairment testing of goodwill has become controversial and is challenging for preparers (Beatty and Weber, 2006). IFRS 3 requires companies to use fair value accounting to measure and recognize all assets acquired and liabilities assumed, considering intangible assets and contingent liabilities which have not previously recognized by acquirers. IFRS 3 analyzes the accounting when an acquirer gains control of an organization and requires the use of the acquisition method upon acquisition. To implement the goodwill impairment tests as stipulated by IAS 36, companies should value their operational business units using onerous processes on the basis of forward-looking information (business plans, etc.). Simultaneously, the disclosure accounting information for business combinations is highly relevant to investors and other parties of financial statements. During the business combination procedure often large amounts of money are available and can affect firm's strategy and value (Sudarsanam 2010).

This study examines the relation of cost of equity associated with the disclosure quality of IFRS 3 and the IR compliance. Employing an IR sample composed of 498 non-financial firms that use IR either mandatorily or voluntarily from 2011 to 2019, we investigate the impact of IR and IFRS 3 disclosure quality on the cost of equity. Motivated by previous studies (i.e., Chava, 2014; Breuer et al., 2018), we aim to highlight the informativeness effects of the disclosure quality of IFRS 3 and IR compliance on cost of equity through the two distinct channels firm risk and investor protection base.

We investigate the impact of the disclosure quality of IFRS 3 and IR compliance on the cost of equity, considering their legal, cultural, and political factors. In companies with strong legal, cultural, and political factors, our results show that the cost of equity falls when a firm

invests in IR and at the same time provides high levels of IFRS 3 information. The high level of informativeness that arises from the transparent and concise disclosure quality of IR regime and IFR3 standard reduces the opportunistic behavior of managers that use IR as a tool for benefitting themselves. A contribution of our study is to show that differences in investor protection level may lead to different outcomes regarding the relation between IR and the cost of equity at the firm level.

Moreover, the risk channel (Oikonomou et al., 2012; Sassen et al., 2016; Badia et al., 2020) represents the idea that investors consider companies with low IR compliance to be riskier. We test whether the high level of disclosure quality of IFRS 3 and IR compliance affects on firm risk. We find that higher IFRS 3 disclosure score lowers firms' risk in companies with high IR compliance. We interpret the negative relation at higher levels of disclosure as evidence that investors consider firms with low levels of IR informativeness to be riskier. We contribute to the wider research on the firm risk related to disclosure quality of accounting information. This study for first contributes to the IR literature by examining South African firms and voluntary adopters (non-South African firms), examining the disciplining role of a new form of disclosure, IR.

Finally, we examine the research question whether the firm risk and the high level of disclosure quality of IFRS 3 and IR compliance affects on cost of equity. We find that the positive impact of IFRS 3 disclosure quality and of IR compliance to cost of equity is more intense when firms' risk is low, which contributes to cost of equity literature. This suggests that high IR and IFRS3 disclosure quality reduces information asymmetry between managers and external stakeholders, lowers litigation risk (Billings et al., 2015) and improves a firm's financial transparency (Baboukardos and Rimmel, 2016; Barth et al., 2017).

There are two competing views on whether IR implementation is beneficial to shareholders and other stakeholders. Stakeholder theory suggests that IR is beneficial to shareholders since IR improves the quality of financial and non-financial information to providers of financial capital in order to enable a more efficient and productive allocation of capital (Lee and Yeo, 2016; Breuer et al, 2018). Non-financial information that is provided by IR reduces investors' information processing cost (Lee and Yeo, 2016) and includes information such as workers' wellbeing, respect for human rights, better management of environmental emission and waste, etc (Becchetti et al, 2015). In contrast, agency theory expects a negative effect of IR on financial performance because of higher implementation costs. Through IR implementation, managers may benefit at the expense of shareholders by wasting firm resources, while enhancing their prestige by spending more cash than normal on environmental and social issues (Barnea and Rubin, 2010; Breuer et al, 2018). Synthesizing these two points of view, IR theory leads to stronger internal communications, requires firms to provide new ways of managing and disclosing information (De Villiers et al, 2017). IR firms adjust their strategy in an integrated manner considering environmental, human, social, and natural principles (Busco et al, 2019). The arguments based on the two accounting theories above suggest the possibility that investor legal protection can play an important role in helping firms find the optimal level of IR expenditure while avoiding misinvesting (Breuer et al, 2018).

The rest of this paper is organized as follows. Section 2 presents the research hypotheses

and the literature review. Section 3 describes the data. Section 4 presents the main results and Section 5 shows the conclusions of the study.

2 Theoretical background and hypothesis development

2.1 Cost of equity, IR and IFRS 3

The impact of IR on cost of equity is scarcely explored (Carvalho and Murcia, 2016). Previous studies have examined the different ways in which the disclosure of information can affect the cost of equity in general. The first way studies the ability of the disclosure information to reduce the estimation risk and uncertainty in the asset pricing models (Lambert et al., 2007). Previous studies (e.g. Bae et al., (2020)) exhibit in their empirical models that when companies do not disclose the same information to their market participants, there is an incensement to the adverse selection risk for liquidity providers, who goal on larger compensations and widen the bid-ask spread. As a result, they conclude that the low level of disclosure information reduces liquidity and increases the cost of capital. The second one is related to the ability of disclosure accounting information to reduce information asymmetry between management and shareholders, and among shareholders themselves (García- Sánchez and Noguera-Gámez, 2017a). Diamond and Verrecchia (1991) via reducing information asymmetry among market participants, find a negative relation between the high-quality disclosure information and the cost of equity capital. Using an international sample, El Ghoual et al. (2018) find a negative association between environmental performance and cost of equity.

The second one is related to the ability of disclosure accounting information to reduce information asymmetry between management and shareholders, and among shareholders themselves (Easley and O'hara, 2004; García-Sánchez and Noguera-Gámez, 2017b). Diamond and Verrecchia (1991) via reducing information asymmetry among market participants, find a negative relation between the high-quality disclosure information and the cost of equity capital. Kim and Verrecchia (1994) and Brown and Hillegeist (2007) exhibit the relation between disclosure quality policy and information asymmetry and state that poor information disclosure quality can provide different level accounting information to investors and thereby exacerbate information asymmetry in markets. El Ghoual et al. (2011) find that US companies can be benefited from investment in CSR activities in terms of a lower cost of equity. Dhaliwal et al. (2012) examine that companies with a high cost of equity are willing to adopt CSR in the following year in order to have a subsequent reduction in their cost of equity. Sharfman and Fernando (2008) find that an improvement in environmental risk management has a negative impact on weighted average cost of capital. Using an international sample, El Ghoual et al. (2017) find a negative association between environmental performance and cost of equity.

Despite the theoretical background being made of high disclosure quality information under IR, there are limited studies that investigate the direct effect of IR practice on corporate disclosure. Barth et al. (2017) analyze the positive relationship between IR disclosure quality and liquidity and expected future cash flow highlighting the improved disclosure quality information environment under IR regime. Obeng et al. (2020) find that

the impact of disclosure IR quality on agency costs is more negative in countries with a stakeholder orientation than in countries with a shareholder orientation. Moreover, they address that effectiveness of IR disclosure quality is more pronounced in diversified companies that face greater agency problems. Hence we hypothesize that:

H₁: Higher IFRS 3 disclosure score lowers firms' cost of equity in firms with high IR compliance.

2.2 Cost of equity and investor protection

Focusing on the investor base channel, companies with low IR compliance are related to higher equity financing costs due to a narrower investor base. Persakis and Iatridis (2017) find a negative association between the cost of capital and investor protection. Heinkel et al. (2001) find that the tendency for “green” investing results in fewer investors willing to hold stocks from “polluting” firms. If a large number of green investors screen out these companies and opt not to invest in them, such companies have to offer to their shareholders higher expected returns as a compensation for the lack of risk sharing (Merton, 1987). As a result, this would decrease firms' share prices and increase their cost of equity (Breuer et al., 2018). Moreover, previous studies find that there are investors who use positive and negative screenings that limit or encourage investment in certain types of companies. Hong and Kacperczyk (2009) examine that norm-constrained institutional investors (e.g. pension funds) invest less in “sin” stocks –firms from alcohol, tobacco, and gambling industry – compared to institutional investors with arbitrage orientation (e.g. mutual or hedge funds).

Becchetti et al. (2012) focus on negative abnormal returns when a stock is deleted from a sustainability index. They address that the deletion of a share from the index sustainability pushes investors to sell a stock because it no longer complies with CSR standards regardless of whether the stock is profitable or not. Similarly, El Ghouli and Karoui (2017) show that high-CSR funds display poorer returns, suggesting that their investors offset utility from non-monetary attributes. Liang and Renneboog (2017) find a strong relation between firms' CSR ratings and their national institutional status relating to regulatory quality, political institutions, culture, ownership structure, corporate governance and financial performance at firm level. Chava (2014) finds that companies with concerns about hazardous waste and climate change attract fewer institutional investors.

Holthausen (2009) finds that it is difficult to estimate the impact of legal enforcement or investor protection in isolation. Therefore, we measure investor protection by examining the following categories. The first category captures the legal factors. We follow Breuer et al (2018) and Liang and Renneboog (2017) and apply the revised anti-director rights index (ADRR) used by Djankov, et al. (2008) as our basic measure to capture the country-level legal protection of investors. The second category consists of cultural factors based on Hofstede index (Hofstede et al, 2010). The third category contains the political factors that were acquired from the Worldwide Governance Indicator. The presence of a high level of legal, cultural and political factors is negatively related to cost of equity for companies with high IR compliance and IFRS 3 disclosure quality, leading to our H2a, H2b and H2c research hypotheses.

We estimate investor protection using legal, cultural and political factors based on the

study of Albuquerque et al., (2017), Athanasakou, et al. (2020), Barth, et al. (2017), Breuer, et al. (2018) and Gu, et al. (2019).

H_{2a}: IR compliance and IFRS 3 disclosure quality lower cost of equity in firms with strong legal factors.

H_{2b}: IR compliance and IFRS 3 disclosure quality lower cost of equity in firms with strong cultural factors.

H_{2c}: IR compliance and IFRS 3 disclosure quality lower cost of equity in firms with strong political factors.

2.3 Firm risk, IR and IFRS 3

The risk channel reflects the idea that investors consider companies with low IR compliance and low IFRS 3 disclosure quality to be riskier. Waddock and Graves (1997) address that socially irresponsible firms may be linked high substantial litigation risk and face future lawsuits. Moreover, Chatterji, et al. (2009) advocate that companies with high CSR disclosure quality have the tendency to reduce conflicts with stakeholders, and hence they are faced with fewer adverse events such as strikes, environmental violations and product recalls. Godfrey (2005) states that stakeholders do not criticize firms with CSR activities if an adverse event occurs to the same level as they penalize socially irresponsible firms. Kim et al. (2014) analyze the potential smoothing effect of CSR information on crash risk, which is particularly pronounced when companies have less effective governance. Lambert et al. (2007) find that an increase in disclosure quality information reduces market risk. Ng (2011) takes accounts the findings of Lambert, et al. (2007) to investigate the association between disclosure quality information and liquidity risk as estimated by Pastor and Stambaugh (2003). Lang and Maffett (2011) suggest that more transparent firms with high disclosure quality information are related with lower liquidity volatility and linked with fewer extreme illiquidity events. Regarding the impact of IR compliance to firm's risk, Oikonomou et al. (2012) find that CSR is negatively associated with systemic risk. Sassen et al. (2016) address that higher CSR reduces overall and idiosyncratic risk. Therefore, based on Badia, et al. (2020), our research hypothesis is stated below:

H₃: Higher IFRS 3 disclosure score lowers firms' risk in firms with high IR compliance.

2.4 Cost of equity and firm risk

Previous studies have focused on the different ways in which disclosure quality information can reduce the estimation of firm risk and the characteristics of uncertainty in the asset pricing models that investors use (Coles et al., 1995; Lambert et al., 2007). The reductions in risk enable firms to raise their funds through debt and equity at a lower cost, improving their financial performance (Dhaliwal et al., 2014; El Ghouli et al., 2011; Goss and Roberts, 2011). Moreover, a high level of transparency from greater disclosure accounting information reduces the monitoring costs for investors, who require a lower rate of return for their holding stocks (Lombardo and Pagano, 2002). Finally, a higher level of quality disclosure information

improves investor trust and expands the investor base, encouraging risk sharing (Vitolla et al., 2020). These mechanisms represent the theoretical ways by which the disclosure information can reduce the cost of equity capital.

H₄. IR compliance and IFRS 3 disclosure quality lower cost of equity when firms' risk is low.

3 Research Design

3.1 Model Specification

3.1.1 Cost of equity, IR and IFRS 3

To test H₁, we estimate the following model in line with the arguments of Athanasakou et al., (2020), Breuer et al., (2018) and Chava (2014).

$$AVCOE_{i,t} = a_0 + a_1 PREPOST_{i,t} + a_2 IR_{i,t} + a_3 IFRS3_{i,t} + a_4 IR_{i,t} \times IFRS3_{i,t} + a_5 ROA_{i,t-1} + a_6 LEV_{i,t-1} + a_7 LnTA_{i,t} + a_8 LnBIDASK_{i,t} + a_9 LOSS_{i,t} + a_{10} AAWCA_{i,t} + a_{11} EXFIN_{i,t} + a_{12} STDOL_{i,t} + a_{13} R_{i,t-1} + e_{i,t} \quad (1)$$

AVCOE _{i,t}	The average of cost of equity models of Claus και Thomas (2001), Gebhardt et al.,(2001), Ohlson και Jüttner-Nauroth (2005) and Easton (2004).
PREPOST _{i,t}	IR takes 1 for firm years of IR implementation, and 0 for firm years of non-IR implementation.
IR _{i,t}	is the IR disclosure score index.
IFRS3 _{i,t}	is the IFRS_3 disclosure score index.
ROA _{i,t-1}	Is the ratio of net income before interest and taxes to total assets at the end of fiscal year t-1.
LEV _{i,t-1}	A proxy for leverage equal to total liabilities to total assets at the end of fiscal year t-1.
LNNTA _{i,t}	The natural logarithm of total assets at the end of fiscal year t.
LNIBIDASK _{i,t}	Logarithm of average Bidask over the 365 days prior to fiscal year end. Bidask is daily closing ask price minus closing bid price, divided by their average, in percent.
LOSS _{i,t}	represents a dummy variable taking the value of 1 if net income is negative and 0 otherwise.
AAWCA _{i,t}	Absolute abnormal working capital accruals (calculated via the modified Jones model).
EXFIN _{i,t}	Indicator variable equal to 1 if either operating cash flows minus average capital expenditure from years t-3 through to year t-1 (scaled by current assets in t-1) is less than 0.5 (Dechow et al.,1995).
STDOL _{i,t}	Is the standard deviation of the operating income to standard deviation of the operating cash flows. Both measures are standardized with total assets.
R _{i,t-1}	Stock return compounded daily over the 365 days prior to fiscal year end.
e _{i,t}	Is the error term.

In Eq. (1), α_2 , α_3 and α_4 are expected to be negative if the high levels of disclosure quality of IFRS 3 and IR compliance affect the cost of equity, supporting H₁. The other independent variables in Eq. (1) are control variables which have been used in previous studies as potential

determinants of the cost of equity. $ROA(t-1)$, $LnTA$ and $R(t-1)$ are motivated by empirical asset pricing studies (e.g. Francis et al., 2008; Chava, 2014) that regularly find a tendency for the cost of equity capital to be related with these control variables, and thus a_5 , α_7 and α_{13} are expected to be negative. $LEV(t-1)$ is motivated by a basic insight from corporate finance which addresses that, for a given stream of firm cash flows, the leverage affects positively the cost of equity. Hence, a_6 is expected to be positive. a_{10} is expected to be positive, since it illustrates the overall response of the dependent variable to earnings management. Dechow et al., (1995) find the positive relation between earnings management and the cost of equity capital.

3.1.2 Cost of equity and investor protection

In Eqs. (2), (3) and (4) we test the effect of legal, cultural and political factors on cost of equity for firms with high IFRS 3 disclosure quality and IR compliance respectively. Negative coefficients on our basic interaction terms that check the IR and IFRS 3 disclosure score indexes on investor protection variables would show evidence consistent with H_{2a} , H_{2b} and H_{2c} .

$$AVCOE_{i,t} = a_0 + a_1 PREPOST_{i,t} + a_2 IR_{i,t} + a_3 IFRS3_{i,t} + a_4 IR_{i,t} \times IFRS3_{i,t} + a_5 ENFORCE_{i,t} + a_6 IR_{i,t} \times ENFORCE_{i,t} + a_7 IFRS3_{i,t} \times ENFORCE_{i,t} + a_8 C_LAW_{i,t} + a_9 IR_{i,t} \times C_LAW_{i,t} + a_{10} IFRS3_{i,t} \times C_LAW_{i,t} + a_{11} ROA_{i,t-1} + a_{12} LEV_{i,t-1} + a_{13} LnTA_{i,t} + a_{14} LnBIDASK_{i,t} + a_{15} LOSS_{i,t} + a_{16} AAWCA_{i,t} + e_{it} \quad (2)$$

ENFORCE_{i,t} Public enforcement index. Index of the effectiveness of law enforcement of investor protection through sanctions such as fines and prison terms. Higher values indicate better enforcement. Djankov et al (2008).

C_LAW_{i,t} Legal origin. Equals 1 for common law country firms, and 0 for code law country firms.

All other variables are defined in Eq. (1).

$$AVCOE_{i,t} = a_0 + a_1 PREPOST_{i,t} + a_2 IR_{i,t} + a_3 IFRS3_{i,t} + a_4 IR_{i,t} \times IFRS3_{i,t} + a_5 LTO_{i,t} + a_6 IR_{i,t} \times LTO_{i,t} + a_7 IFRS3_{i,t} \times LTO_{i,t} + a_8 MAS_{i,t} + a_9 IR_{i,t} \times MAS_{i,t} + a_{10} IFRS3_{i,t} \times MAS_{i,t} + a_{11} IDV_{i,t} + a_{12} IR_{i,t} \times IDV_{i,t} + a_{13} IFRS3_{i,t} \times IDV_{i,t} + a_{14} UAI_{i,t} + a_{15} IR_{i,t} \times UAI_{i,t} + a_{16} IFRS3_{i,t} \times UAI_{i,t} + a_{17} ROA_{i,t-1} + a_{18} LEV_{i,t-1} + a_{19} LnTA_{i,t} + a_{20} LnBIDASK_{i,t} + a_{21} LOSS_{i,t} + a_{22} AAWCA_{i,t} + e_{it} \quad (3)$$

Where:

MAS_{i,t} Hofstede Masculinity Index. Hofstede et al. (2010).

IDV_{i,t} Hofstede Individualism Index. Hofstede et al. (2010).

UAI_{i,t} Hofstede Uncertainty Avoidance Index. Hofstede et al. (2010).

LTO_{i,t} Hofstede Long-term Orientation Index. Hofstede et al. (2010).

All other variables are defined in Eq. (1).

$$AVCOE_{i,t} = a_0 + a_1 PREPOST_{i,t} + a_2 IR_{i,t} + a_3 IFRS3_{i,t} + a_4 IR_{i,t} \times IFRS3_{i,t} + a_5 CORPT_{i,t} + a_6 IR_{i,t} \times CORPT_{i,t} + a_7 IFRS3_{i,t} \times CORPT_{i,t} + a_8 RLAW_{i,t} + a_9 IR_{i,t} \times RLAW_{i,t} + a_{10} IFRS3_{i,t} \times RLAW_{i,t} + a_{11} ROA_{i,t-1} + a_{12} LEV_{i,t-1} + a_{13} LnTA_{i,t} + a_{14} LnBIDASK_{i,t} + a_{15} LOSS_{i,t} + a_{16} AAWCA_{i,t} + e_{it} \quad (4)$$

Where:

CORPT _{i,t}	Control of Corruption reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.
R_LAW _{i,t}	Rule of Law reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

All other variables are defined in Eq. (1).

3.1.3 Firm risk, IR and IFRS 3

In Eq. (5), firm risk is our dependent variable. We estimate firm's risk using three different risk variables. We use BETA variable that captures the systematic risk (Breuer et al. 2018), SMOOTH variable that captures total firm risk (Pastor et al., 2008; Breuer et al. 2018) and Altman's Z_SCORE (Altman, 1993) that captures the risk of default (Chava, 2014).

$$\text{RISK VARIABLE \{BETA/ SMOOTH/ Z_SCORE\}}_{i,t} = a_0 + a_1 \text{PREPOST}_{i,t} + a_2 \text{IR}_{i,t} + a_3 \text{IFRS3}_{i,t} + a_4 \text{IR}_{i,t} \times \text{IFRS3}_{i,t} + a_5 \text{R}_{i,t-1} + a_6 \text{ROA}_{i,t-1} + a_7 \text{LEV}_{i,t-1} + a_8 \text{LNTA}_{i,t} + a_9 \text{LnBIDASK}_{i,t} + a_{10} \text{LOSS}_{i,t} + a_{11} \text{SALES_G}_{i,t} + a_{12} \text{MBR}_{i,t} + a_{13} \text{AAWA}_{i,t} + a_{14} \text{STDOL}_{i,t} e_{it} \quad (5)$$

Where:

BETA _{i,t}	is the market beta coefficient for each firm and for each year
SMOOTH _{i,t}	is the standard deviation of firm's daily stock returns over the past year.
Z_SCORE _{i,t}	We estimate Altman's Z score (Altman, 1993) as follows. $Z_SCORE_{i,t} = 1.2 (WC_{i,t} / TA_{i,t}) + 1.4 (R_E_{i,t} / TA_{i,t}) + 3.3 (EBIT_{i,t} / TA_{i,t}) + 0.6 (MV_{i,t} / TL_{i,t}) + 1.0 (REV_{i,t} / TA_{i,t})$. Where, $WC_{i,t} / TA_{i,t}$ is the Working Capital/Total Assets ratio, $R_E_{i,t} / TA_{i,t}$ is the Retained Earnings/Total Assets ratio, $EBIT_{i,t} / TA_{i,t}$ is the Earnings Before Interest and Tax/Total Assets ratio, $MV_{i,t} / TL_{i,t}$ is the Market Value of Equity/Total Liabilities ratio, $REV_{i,t} / TA_{i,t}$ is the Total Sales/Total Assets ratio
MBR _{i,t}	is market to book value of equity.
SALES_G _{i,t}	Growth rate of annual sales, defined as percentage change in annual sales.

All other variables are defined in equation (1).

α_2 , α_3 and α_4 are expected to be negative if the high levels of disclosure quality of IFRS 3 and IR compliance affect the firm risk, supporting H₃. Control variables of Eq. (5) are consisted of variables that prior studies have found that associated with firm risk. As a proxy of leverage we use LEV(t-1) (Beaver et al., 2005). We expect α_7 to be positive. We use LnTA as proxy of firm size (Breuer et al., 2018), MBR (Fama and French, 1992), ROA(t-1) (Beaver et al., 2005) and we expect a_6 , a_8 and a_{12} be negative as suggests previous literature. α_3 and α_4 are expected to be negative, if the coefficients of LnBIDASK (Christoffersen et al., 2018) and R(t-1) (Jegadeesh and Titman 1993;) have a negative impact on firm risk.

3.1.4 Cost of equity and firm risk

To test H₄, we use Eq. (6). In Eq. (6), α_6 and α_7 are expected to be negative if the interaction terms of IFRS 3 disclosure quality and IR compliance and firm risk variables affect the cost of equity, supporting H₄. The rest independent variables in Eq. (6) are control variables which have been used in previous studies as determinants of the cost of equity. Our model specification for the cost of equity is based on Gebhardt et al. (2001), Pastor et al. (2008), Chava and Purnanandam (2010) and Athanasakou et al., (2020).

$$AVCOE_{i,t} = a_0 + a_1PREPOST_{i,t} + a_2IR_{i,t} + a_3IFRS3_{i,t} + a_4 IR_{i,t} \times IFRS3_{i,t} + a_5 RISK\ VARIABLE \{BETA/SMOOTH/Z_SCORE\}_{i,t} + a_6 IR_{i,t} \times RISK\ VARIABLE \{BETA/SMOOTH/Z_SCORE\}_{i,t} + a_7 IFRS3_{i,t} \times RISK\ VARIABLE \{BETA/ALTMAN/STEV\Delta OI\}_{i,t} + a_8 ROA_{i,t-1} + a_9 LEV_{i,t-1} + a_{10} LNTA_{i,t} + a_{11} MBR_{i,t} + a_{12} AAWCA_{i,t} + a_{13} EXFIN_{i,t} + a_{14} STDO_{i,t} + a_{15} R_{i,t-1} e_{it} \quad (6)$$

Gebhardt et al. (2001) find robust relationship between cost of equity capital and some firm-level characteristics such as BETA, LnTA and MBR. Similarly to Gebhardt et al. (2001), α_5 is expected to be positive, and α_{10} and α_{11} to be negative respectively. a_{12} is expected to be positive aligned to Athanasakou et al., (2020) that illustrate the positive impact of earnings management on the cost of equity capital. Pastor et al. (2008) find a positive relationship between expected market return and volatility of the standard deviation operating income to standard deviation of the operating cash flows. Thus, we expect α_{14} is expected to be positive. a_{15} is expected to be negative confirming Chava and Purnanandam (2010) study that check for past stock returns to consider for any weakness in analyst forecasts and find that the past stock return is a statistical significant estimator of the expected return on the stock.

3.2 Cost of equity

Based on Breuer et al. (2018), we calculate it as the internal rate of return in four different valuation models. We use four models based on Claus and Thomas (2001), Gebhardt et al. (2001), Easton (2004), and Ohlson and Juettner-Nauroth (2005) to calculate the internal rate of stock returns in such a way that the present value of the expected future residual income, derived from analyst consensus earnings forecasts, equals to the current stock price. Claus and Thomas (2001) address that earnings forecasts should be estimated and collected early after the prior year-end and in the same month for each company in every year. In our analysis in order to ensure that our forecasted data are publicly available, we collect analyst earnings forecasts from the month of March. Following the methodology of previous research (e.g., El Ghouli et al., 2018), as a proxy for a firm's cost of equity we use the average of the cost of equity of the four models (AVCOE) we mention before. This ensures that the unique features in the data of one of the four models that may distort the overall results are eliminated and smoothed out.

3.3 Integrated reporting disclosure score index

We follow the methodology of Lee and Yeo (2016) and create a composite IR index by assigning equal weights (see Street and Bryant, 2000) to each of the eight content elements - (1) Organizational overview and external environment; (2) Governance; (3) Business model; (4) Risks and opportunities; (5) Strategy and resource allocation; (6) Performance; (7) Outlook; and (8) Basis of preparation and presentation - in the IR framework. The IR disclosure score index (IR) is an unweighted index and is derived from dividing the score obtained for each firm

by the maximum score (equal to 40 observations based on Lee and Yeo's (2016) checklist². Using the integrated reports of each company, we complete a checklist, where the answers are "comply" / "non-comply" / "not-applicable". To check for robustness, we create an alternative IR disclosure score index (IR_R) based on Demmer, et al. (2019). IR_R is defined as the absolute difference between the full sample median of the IR disclosure scores and firm i's IR disclosure score, divided by firm i's IR disclosure score.

3.4 IFRS 3 disclosure score index

The IFRS 3 Disclosure Score Index (IFRS 3) is an unweighted index and is derived by scaling the total received score obtained for each firm by the maximum score (equal to 32 observations). It is based on the checklists developed by EY (2018) and Deloitte (2018).³ Using the annual and integrated reports of each firm, we complete a checklist consisted of the choices of "comply" or "non-comply/not-applicable". To check for robustness, we create the alternative IFRS 3 Disclosure Score Index (IFRS 3_R), which is based on Street and Gray (2002) and Amiraslani et al. (2013). According to Street and Gray (2002), for each subsample we calculate an unweighted index. Then, we estimate a ratio of the number of all subsample unweighted indexes scaled by the number of subsamples. This study has used six subsamples: (1) Business combination; (2) Fair value of acquisition-date; (3) Amendments to IFRS 3; (4) Goodwill; (5) IAS 36; and (6) Impairment of assets. This approach applies equal weighting to each reporting item and avoids the problem of assigning more weight to subsamples with a larger number of requirements (Amiraslani et al, 2013).

3.5 Hofstede indexes

Masculinity is related to "the distribution of values between the genders" (Hofstede, 2011, p. 12). In "feminine" countries, there is a balance between family and work sympathizing for and taking care of the weak. On the other hand, masculine countries put emphasis on economic growth (Hofstede et al., 2010) as well as on create wealth (Lenssen et al, 2007). Through IR implementation, since shareholders gain a higher consciousness of the firms' risks, the impact of IR compliance on the cost of equity capital is expected to be improved in masculine countries. Even if IR compliance is expected to reduce the cost of equity, the mentality and the way of handling the risk by the management reduce the effectiveness of the new accounting scheme (Vena et al., 2020).

Individualism and its opposite collectivism, as social and not individual characteristics, refer to the degree to which people belong to groups (Hofstede et al., 2010). In an individualistic orientated country, people take care of themselves. Managers tend to have more flexibility to opportunistically fulfill their private benefits by undertaking more risky strategies and activities (Han et al., 2010). The findings of previous studies (e.g. Vena et al., 2020) suggest that the effects of IR compliance tend to be smoothed (strengthened) in countries where individualism (collectivism) is high. Thus, in more collectivistic orientated countries when managers reduce the risk on their strategies, financiers may require a lower interest rate since their investments are safer.

² The detailed IR compliance checklist is presented in Table A1 in the Appendix.

³ The detailed IFRS 3 checklist is presented in Table A2 in the Appendix.

Uncertainty avoidance “deals with a society's tolerance for ambiguity” (Hofstede, 2011, p. 10), thus it is different concept from that of risk avoidance. Hofstede et al. (2010) apply this category to describe how firms react to unusual, novel, and surprising situations. Countries with weak levels of uncertainty avoidance may be tolerant to deviant situations or ideas, are reluctant to use innovative ideas and technologies since they feel comfortable in chaotic situations (Vena et al., 2020).

Long-term orientation focuses on the way people or firms react to social changes. Firms of countries with longer-term orientation usually adapt more easily to new conditions related to their strategy (Gcis et al., 2018; Hofstede et al., 2010). When firms are short-term-oriented, they avoid establishing strong relations, since they do not prefer to make strong partnerships that promote their stability (Khlif, 2016). We expect a positive coefficient for the interaction term between IR compliance and long-term orientation. Investors are expected to accept the greater risk strategies taken by “innovative” management from long-term-oriented firms, adjusting the cost of equity accordingly, to be related with higher values.

3.6 Sample selection

We focus on an IR sample composed of non-financial firms that use IR either mandatorily or voluntarily from 2011 to 2019. This period was chosen to reflect that the IIRC was established in 2010. Only South African firms use IR mandatorily. Hence, our sample included all non-financial listed South African firms. Voluntary IR adopters have been collected from PWC (2016), KPMG (2019) and the official website of the IIRC. We obtained data from DataStream. Our sample excluded financial, insurance and real estate firms. Adjusting for missing values, our final sample included 3,984 firm-year observations. The voluntary adopters are 289 firms, and the mandatory adopters are 209 firms. Panel A of Table 1 reports the sample selection process. The sample distribution by industry is presented in Panel B of Table 1. Most firms belong to the industrial sector (31.93%), the energy sector (12.65%) or the consumer staples sector (13.45%). Panel C reports the distribution of the IR sample by country. The sample consists of companies from 19 countries, with most of them coming from South Africa (41.97%), Japan (30.92%) or the United States (10.84%). Other countries represent less than 10% of the sample individually.

Table 1

Panel A: Sample selection process.

<i>Selection Criteria</i>	<i>Observations</i>	<i>Firms</i>
IR firm-year observations from 2011 to 2019	4664	583
Less:		
Firm-year observations in financial, insurance and real estate	(96)	(12)
Firm-year observations whereby the dependent variables are	(344)	(43)

Firm-year observations whereby the control variables are missing and extreme outliers at 1% at the top and bottom	(240)	(30)
<i>Usable observations</i>	<i>3984</i>	<i>498</i>

Panel B: Sample distribution by industry.

<i>Industry</i>	<i>Observations</i>	<i>Frequency</i>
1 Consumer Discretionary	440	11.04%
2 Consumer Staples	536	13.45%
3 Energy	504	12.65%
4 Health Care	352	8.84%
5 Industrials	1272	31.93%
6 Information	40	1.00%
7 Materials	128	3.21%
8 Telecommunication Services	304	7.36%
9 Utilities	408	10.24%
<i>Total</i>	<i>3984</i>	<i>100.00%</i>

Panel C: Sample distribution by country

<i>Country</i>	<i>Observations</i>	<i>Frequency</i>
Austria	8	0.20%
Belgium	8	0.20%
Brazil	32	0.80%
Denmark	8	0.20%
France	104	2.61%
Germany	192	4.82%
Greece	16	0.40%
India	8	0.20%
Italy	40	1.00%
Japan	1232	30.92%
Netherlands	16	0.40%
Poland	8	0.20%
South Africa	1672	41.97%
Spain	48	1.20%
Sri Lanka	8	0.20%
Sweden	16	0.40%
Switzerland	8	0.20%
United Kingdom	128	3.21%
United States	432	10.84%
<i>Total</i>	<i>3948</i>	<i>100.00%</i>

3.7 Methodology

We apply univariate analysis to create Pearson correlation matrix to test our hypotheses. In a multivariate analysis, we use fixed effects OLS estimation. In Eqs. (1) to (6), we use the Newey and West (1987) method modified for use in a panel dataset to create robust standard errors (Andrews, 1991; Williams, 2000). The Newey-West approach has been used to test for heteroskedasticity and autocorrelation (Sun and Cui, 2014). For all variables, we run panel unit root tests (assuming a common unit root process), and specifically the Levin, Lin and Chu test,

rejecting the null hypothesis that the unit root process is not stationary at levels. The independent variables are standardized to mitigate multicollinearity issues (Kim and Park, 2010). All variables except dummy variables are winsorized at the top and bottom 1% of observations in each year. Industry and year fixed effects are also controlled through dummy variables (Breuer et al., 2018).

4 Results

4.1 Descriptive statistics

Table 2 summarizes the descriptive statistics. Panel A reports the descriptive statistics for the dependent variables. The mean for the average of cost of equity models (AVCOE) is 0.1044 (st. dev, 0.0247), for the market beta coefficient (BETA) is 0.9997 (st. dev, 0.5976), for the standard deviation of the operating income to standard deviation of the operating cash flows market beta coefficient (SMOOTH) is 0.6448 (st. dev, 0.6511) and for the Altman's Z score coefficient (Z_SCORE) is 2.460 (st. dev, 1.5000).

Panel B reports the descriptive statistics for the financial control variables. The average for the dummy variable of IR implementation (PREPOST) is 0.795 (st.dev. 0.403). That for the IR disclosure score quality index (IR) is 0.701 (st.dev. 0.131) and that for the IFRS 3 disclosure score index (IFRS3) is 0.715 (st.dev. 0.128). The respective means for the alternative IR disclosure score index (IR_R) and for the alternative IFRS 3 disclosure score index (IFRS3_R) are 0.752 (st.dev. 0.135) and 0.703 (st.dev. 0.152) respectively. The average for annual stock return is (R) is 0.090 (st.dev. 0.468), for leverage (LEV) is 0.223 (st.dev. 0.347), for absolute abnormal working capital accruals (AAWA) is 0.183 (st.dev. 0.3195), and for standard deviation of the operating income to standard deviation of the operating cash flows (STDOI) is 0.001 (st.dev. 0.001).

Panel C reports the descriptive statistics for the investor protection control variables. The average of public enforcement index (ENFORCE) and legal origin index (C_LAW) are 0.099 (st.dev. 0.105) and 0.560 (st.dev. 0.496) respectively. The average for the masculinity index (MAS) is 0.716 (st.dev. 0.172), for the individualism index (IDV) is 0.625 (st.dev. 0.147), for the uncertainty avoidance index (UAI) is 0.645 (st.dev. 0.209) and for the long-term orientation index (LTO) is 0.546 (st.dev. 0.257). Finally, that for the control of corruption index (CORPT) is 0.134 (st.dev. 0.009), while that for the rule of law index (R_LAW) is 0.865 (st.dev. 0.728).

Table 2
Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Max	Min	N
Panel A: Depended Variables						
AVCOE	0.1044	0.1064	0.0247	1.1479	0.0744	2957
BETA	0.9997	0.9986	0.5976	8.1987	-17.5091	3220
SMOOTH	0.6448	0.6042	0.6511	6.1377	-8.8479	3880
Z_SCORE	2.460	2.340	1.500	5.001	0.000	3914

Panel B: Financial Control Variables						
PREPOST	0.795	1.000	0.403	1.000	0.000	3976
IR	0.701	0.700	0.131	0.975	0.125	3965
IR_R	0.752	0.750	0.135	1.000	0.125	3965
IFRS3	0.715	0.715	0.128	0.937	0.100	3961
IFRS3 R	0.703	0.739	0.152	0.958	0.100	3961
LnBIDASK	0.001	0.001	0.0001	0.001	0.001	3894
LOSS	0.140	0.000	0.347	1.000	0.000	3944
AAWA	0.183	0.122	0.195	1.171	0.000	3919
EXFIN	0.096	0.000	0.295	0.001	0.001	3894
lnTA	16.943	16.823	3.064	24.103	1.386	3890
LEV(-1)	0.223	0.205	0.347	1.849	0.001	3984
MBR	2.607	1.402	3.173	26.251	0.171	3984
ROA(-1)	0.456	0.510	0.342	1.230	0.000	3914
SALES_G	2.014	2.123	1.283	10.109	-5.741	3849
R	0.090	0.041	0.468	0.412	-0.488	3849
STDOI	0.001	0.001	0.001	0.061	0.000	3693
Panel C: Investor Protection Control Variables						
ENFORCE	0.099	0.111	0.105	1.333	0.000	3984
C_LAW	0.560	1.000	0.496	1.000	0.000	3984
LTO	0.546	0.340	0.257	0.880	0.260	3984
MAS	0.716	0.630	0.172	0.950	0.050	3984
IDV	0.625	0.650	0.147	0.910	0.350	3984
UAI	0.645	0.490	0.209	1.000	0.230	3984
CORPT	0.134	0.133	0.009	0.170	0.118	3984
RLAW	0.865	1.312	0.728	2.096	-0.907	3984

The Pearson correlation matrix is presented in Table 3. The IR disclosure score index (IR) and the IFRS 3 disclosure score index (IFRS3) are both negatively correlated with the average of cost of equity models (AVCOE) and the firm risk variables; the market beta coefficient (BETA), the standard deviation of the operating income to standard deviation of the operating cash flows market beta coefficient (SMOOTH) and the Altman's Z score coefficient (Z_SCORE). The dummy variable of IR implementation (PREPOST) appears to be positively correlated with the IR disclosure score index (IR) and the IFRS 3 disclosure score index (IFRS3) and negatively with the market beta coefficient (BETA), the standard deviation of the operating income to standard deviation of the operating cash flows market beta coefficient (SMOOTH). The absolute abnormal working capital accruals (AAWA) are negatively correlated with the IR disclosure score index (IR). We find that companies with higher cost of equity have smaller size, display higher leverage and lower financial performance (ROA) and engage in greater earnings manipulation activities (AAWA).

4.2 Regression results for cost of equity, IR and IFRS 3

Table 4 presents the results of equation (1), confirming H1. We find that companies with high IFRS 3 disclosure score and high IR compliance have a negative impact on cost of equity. In Panel A, the variables of interest (i.e. IR, IFRS3 and IR x IFRS3) have negative coefficients, suggesting that the informativeness that arises from the high level of disclosure quality of IR

and IFRS 3 lower equity costs. Aligned to Dechow, et al. (1995) we find a positive coefficient of AWAA that captures earning management techniques, highlighting the positive response of the cost of equity to the absolute abnormal working capital accruals increase. Our study confirms Francis, et al. (2008) and Chava, (2014) and finds a negative relation between the potential determinants such as LnTA, LnBIDASK and the cost of equity. Moreover, based on Beaver et al., (2005) and Pastor, et al. (2008), we find a positive relation between the potential determinants such as LEV and STDR and the AVCOE. Generally, we observe that in our IR sample the negative impact of firm size and of spread and the positive impact of operating income to operating cash flows volatility that is captured by STDOI (Francis et al., 2008) and of leverage (Beaver, et al. 2005) to the cost of equity.

	08** *		67** *	61** *										
ROA(t-1)	- 0.274** *	0.145***	0.027** *	0.023** *	- 0.035	0.003	0.017	1.00						
LEV(t-1)	0.116** *	- 0.010	- 0.023** *	- 0.017** *	- 0.011	0.063***	0.006	0.212***	1.00					
lnTA	- 0.080** *	- 0.175***	- 0.252** *	- 0.264** *	- 0.135***	0.008	0.002	0.032***	0.078** *	1.00				
lnBIDASK	- 0.004** *	0.151***	0.031** *	0.225** *	- 0.119***	0.034	0.039*	0.295***	0.151** *	0.046***	1.00			
LOSS	0.048** *	- 0.007	0.005	0.018	0.068***	0.038*	0.001	0.334***	0.132** *	0.004	0.004	1.00		
AAWA	0.039** *	- 0.069***	0.043** *	0.088** *	0.078***	0.020	0.012	0.116***	0.063** *	0.053***	0.219***	0.028	1.00	
EXFIN	- 0.018	0.038*	0.000	0.035	0.044***	0.093***	0.005	0.056**	0.004	0.002	0.036	0.031	0.036	1.00

STDOI	0.158** *	-0.133***	-0.181** *	-0.173** *	0.123***	0.006	0.061***	-0.078***	0.096** *	-0.181***	-0.278***	0.050* *	0.086* **	0.033	1.00							
R	0.022	0.008	0.018**	0.023**	0.086***	0.017	0.013	0.022	0.087** *	0.022	0.011	0.038*	0.007	0.036	0.147**	1.00						
SALES_G	-0.070** *	0.081***	0.028	0.011	0.007	0.021	0.009	0.048**	0.062** *	0.103***	0.197***	0.033	0.039*	0.031	0.066**	-0.08	1.00					
C_LAW	-0.640** *	0.220***	0.044** *	0.042** *	-0.186***	0.016	0.054**	0.323***	0.046** *	0.0596**	0.0613*	0.053*	0.286* **	0.024	0.297**	0.019	0.143** *	1.00				
ENFORCE	-0.041*	0.023***	-0.005	-0.040*	-0.017**	-0.008	-0.002*	0.010	0.034	0.027	0.068***	0.008	0.014	0.006	0.009	0.006	0.302	0.034	0.034	1.00		
LTO	0.073** *	-0.227**	0.046** *	0.045** *	0.206***	0.046**	0.049**	0.322***	0.023	0.068***	0.058***	0.057*	0.342*	0.004	0.272**	0.005*	0.137** *	0.091**	0.027	1.00		
MAS	-0.075** *	0.212***	0.045** *	0.048** *	-0.162***	-0.041***	-0.029***	0.302***	0.049** *	0.066***	0.381***	0.028	0.367* **	0.008*	0.151* **	0.029	0.057** *	0.050* *	0.054* *	0.073	1.00	
IDV	-0.0	0.045**	0.0	0.0	0.130***	0.072***	0.011	0.199***	0.121**	0.059***	0.144***	-0.0	0.3	0.031	0.0	0.011	0.005	0.069	0.0	0.074	0.065	1.00

The robustness check presented Panel B of Table 4 supports H1. In Panel B, we estimate equation (2) again, using an alternative IFRS 3 disclosure score index (IFRS3_R), which is based on Street and Gray (2002) and Amiraslani, et al. (2013) and an alternative IR disclosure score index (IR_R) based on Demmer, et al. (2019). The results are similar to those of our basic analysis presented in Panel A.

Table 4
Cost of equity, IFRS 3 disclosure quality and IR compliance

Panel A Equation (1)			Panel B – Robust Analysis of Equation (1)		
Variable	Coefficients	T–stat.	Variable	Coefficients	T–stat.
Intercept	0.2859***	2.9889	Intercept	0.9796***	3.4349
PREPOST	-1.4977***	-3.2219	PREPOST	-1.5305***	-3.7361
IR	-0.3213***	-2.9867	IR_R	-0.2269***	-2.7056
IFRS3	-0.4952***	-3.9147	IFRS3_R	-0.2095**	-2.5310
IR*IFRS3	-0.7521***	-4.2643	IR_R*IFRS3_R	-0.4050***	-3.8897
ROA(t-1)	0.0027	0.2810	ROA(t-1)	0.0013	0.1407
LEV (t-1)	0.0658***	3.3049	LEV (t-1)	0.0657***	2.9328
LnTA	-0.5833***	-2.9797	LnTA	-0.2617*	-1.8963
LnBIDSAK	-0.6351***	-3.1422	LnBIDSAK	-0.4123***	-3.3214
LOSS	0.2272	0.9887	LOSS	0.2477**	1.9736
AAWA	5.35E-05***	3.1192	AAWA	5.33E-05***	3.5783
EXFIN	0.0869	0.2859	EXFIN	0.0446	0.2143
STDOI	0.0002**	1.9762	STDOI	0.0001	0.3662
R(t-1)	-0.0011	-1.1655	R(t-1)	-0.0011	-0.9627
Industry Eff.	Yes		Industry Eff.	Yes	
Year Eff.	Yes		Year Eff.	Yes	
Adj. R-sq	24.3366%		Adj. R-sq		
Sample size	N= 2,839		Sample size	N= 2,839	

4.3 Regression results for cost of equity and investor protection

The regression results from equation (2) are presented in Table 5, confirming H2a. In Panel A, we observe that high levels of IR compliance and IFRS 3 disclosure quality lower cost of equity in firms of countries with strong legal factors. Our legal factors analysis includes variables that control for law enforcement and common law. The variables, which capture the investor protection impact of legal factors are the interaction term of the IR disclosure score index on the public enforcement index (IR*ENFORCE), the interaction term of the IFRS 3 disclosure score index on the public enforcement index (IFRS3*ENFORCE), the interaction term of the IR disclosure score index on the legal origin (IR*C_LAW) and the interaction term of the IFRS 3 disclosure score index on the legal origin (IFRS3*C_LAW). The variables of interest (i.e. IR*ENFORCE, IFRS3*ENFORCE, IR*C_LAW and IFRS3*C_LAW) have significantly negative

coefficients. We find that effective law enforcement in investor protection through sanctions, such as fines and prison terms, decreases the effect on cost of equity when combined with high IFRS 3 disclosure quality and IR compliance. The relation between IR compliance and IFRS 3 disclosure quality and cost of equity seems to be affected by the level of legal origin index of the country. Specifically, IR compliance and IFRS 3 disclosure quality produces higher effects, that is, contributes to reduce more the cost of equity, in common law countries, while firms placed in code law countries benefit less from IR compliance and IFRS 3 disclosure quality.

Table 5
Cost of equity and legal factors

Panel A Equation (2)			Panel B – Robust Analysis of Equation (2)		
Variable	Coefficients	T–stat.	Variable	Coefficients	T–stat.
Intercept	0.3707***	2.4529	Intercept	0.2675**	1.9736
PREPOST	-1.1198***	-2.9620	PREPOST	-1.3526***	-3.5618
IR	-0.3299**	-1.9646	IR_R	-0.8401**	-1.9762
IFRS3	-0.1340***	-2.9661	IFRS3_R	-0.6781***	-4.8495
IR*IFRS3	-0.7802***	-2.6419	IR_R *IFRS3_R	-0.5173***	-3.8589
ENFORCE	-0.0010***	-3.2272	ENFORCE	0.0001	1.0170
IR* ENFORCE	-0.0022***	-3.2110	IR_R * ENFORCE	-0.0011*	-1.7265
IFRS3*			IFRS3_R *		
ENFORCE	0.0012	1.2905	ENFORCE	0.0015*	1.8963
C_LAW	0.6131	1.0180	C_LAW	1.1080	0.6137
IR* C_LAW	-0.1125***	2.8856	IR_R * C_LAW	-0.3159***	-3.2903
IFRS3* C_LAW	-0.1206***	-2.7055	IFRS3_R *	-0.4942***	-3.4349
ROA(t-1)	0.0046	0.6285	ROA(t-1)	0.0042	0.7136
LEV (t-1)	0.0616***	4.3911	LEV (t-1)	0.0628**	3.4132
LnTA	-1.7618***	-2.9361	LnTA	-0.7258***	-2.8404
LnBIDSAK	-0.5680***	-2.8242	LnBIDSAK	-0.8715***	-2.9867
LOSS	-0.1875	-0.9295	LOSS	0.2521**	1.9736
AAWA	5.20E-05***	3.0350	AAWA	5.27E-05***	3.9065
Industry Eff.	Yes		Industry Eff.	Yes	
Year Eff.	Yes		Year Eff.	Yes	
Adj. R-sq	24.1478%		Adj. R-sq	22.4836%	
Sample size	N= 2,986		Sample size	N= 2,986	

In Panel B of Table 5, we estimate equation (2) again, using an alternative IFRS 3 disclosure score index (IFRS3_R), which is based on Street and Gray (2002) and Amiraslani, et al. (2013) and an alternative IR disclosure score index (IR_R) based on Demmer, et al. (2019). The results of legal factors are similar to those of our basic analysis presented in Panel A. Moreover, as in Panel A, we find a strong positive relation between LEV and the cost of equity confirming the findings of Breuer, et al. (2018).

Table 6

Cost of equity and cultural factors

Panel A Equation (3)			Panel B – Robust Analysis of Equation (3)		
Variable	Coefficients	T–stat.	Variable	Coefficients	T–stat.
Intercept	0.1946***	2.9867	Intercept	0.6392***	2.9361
PREPOST	-0.8317***	-2.9279	PREPOST	-1.3594***	-2.8742
IR	-0.1408***	-2.6407	IR_R	-0.1906***	-2.8922
IFRS3	-0.7108**	-1.9962	IFRS3_R	-0.1425***	-3.4094
IR*IFRS3	-0.5648***	-3.8632	IR_R *IFRS3 R	-0.5501***	-3.6769
LTO	0.1397	0.8153	LTO	0.8913	0.9379
IR* LTO	0.3510***	2.8467	IR_R * LTO	0.1025***	3.4877
IFRS3* LTO	0.2243	0.5663	IFRS3_R * LTO	0.1129***	2.8722
MAS	-1.6717** *	-2.8106	MAS	1.7037	1.2026
IR* MAS	-1.4042***	-2.8440	IR_R * MAS	-1.7711***	-3.0110
IFRS3*MAS	-1.4961***	-3.4811	IFRS3_R *MAS	-1.7484***	-3.5088
IDV	0.5688***	2.7199	IDV	0.2086	1.4052
IR*IDV	0.3105***	3.2829	IR_R *IDV	0.4836	0.2015
IFRS3* IDV	0.3901***	3.3948	IFRS3_R * IDV	0.1720	0.7358
UAI	0.6467	0.4636	UAI	-0.2414*	-1.6958
IR*UAI	-0.4223***	-2.9867	IR_R *UAI	-0.1422***	-3.0804
IFRS3*UAI	0.3061	1.1030	IFRS3_R *UAI	-0.1703***	-2.8467
ROA(t-1)	0.0055	1.0588	ROA(t-1)	0.0029	0.3295
LEV (t-1)	0.0534***	2.8408	LEV (t-1)	0.0617***	3.0598
LnTA	-1.2475***	-3.3477	LnTA	-1.3162***	-2.8134
LnBIDSAK	-0.5621***	-3.5377	LnBIDSAK	-0.7058***	-3.0989
LOSS	-0.2100	-1.4706	LOSS	-0.2885	-1.5635
AAWA	4.64E-05***	3.2584	AAWA	5.02E-05***	3.6157
Industry Eff.	Yes		Industry Eff.	Yes	
Year Eff.	Yes		Year Eff.	Yes	
Adj. R-sq	27.9326%		Adj. R-sq	26.6871%	
Sample size	N= 2,986		Sample size	N= 2,986	

The regression results from equation (3) are presented in Table 6, confirming H2b. In Panel A, we observe that high levels of IR compliance and IFRS 3 disclosure quality lower cost of equity in firms of countries with strong cultural factors. The variables of interest (i.e. IR*MAS, IFRS3*MAS, IR* UAI) and (IR*IDV, IFRS3* IDV, IR* LTO) have significantly negative and positive coefficients, respectively. The relation between IR compliance and IFRS 3 disclosure quality and cost of equity seems to be affected by the level of masculinity/femininity of the country. Specifically, IR compliance and IFRS 3 disclosure quality produces higher effects, that is, contributes to reduce more the cost of equity, in masculine countries, while firms placed in feminine countries benefit less from IR compliance and IFRS 3 disclosure quality. The characteristic of uncertainty avoidance seems to negatively affect the relation between IR compliance and cost of equity. The high levels of uncertainty avoidance are associated positively with IR compliance, permitting countries to smooth the aggressive risk-taking

behavior of managers (Gray et al., 2013). The characteristic of individualism /collectivism seems to positively affect the relation between IR compliance and IFRS 3 disclosure quality and cost of equity. IR compliance and IFRS 3 disclosure quality is more intense (in terms of effects on capital markets) in firms of collectivist countries, while individualistic contexts restrain its effectiveness. Finally, we find a positive relation for the interaction term between IR compliance and long-term orientation and cost of equity. Investors have the tendency to accept the greater risk strategies taken by “innovative” management from long-term-oriented firms with high IR compliance, adjusting the cost of equity accordingly, to be related with higher values.

In Panel B of Table 6, we estimate equation (3) again, using an alternative IFRS 3 disclosure score index (IFRS3_R), which is based on Street and Gray (2002) and Amiraslani, et al. (2013) and an alternative IR disclosure score index (IR_R) based on Demmer, et al. (2019). The results of cultural factors are similar to those of our basic analysis presented in Panel A. Moreover, as in Panel A, we find a strong negative relation between LnTA, LnBIDASK and the cost of equity confirming the findings of Athanasakou, et al. (2020).

The regression results from equation (4) are presented in Table 7, confirming H_{2c} . In Panel A, we observe that high levels of IR compliance and IFRS 3 disclosure quality lower cost of equity in firms of countries with strong political factors. To test H_{2c} , we examined interaction terms relating to control of corruption (IR* CORPT and IFRS3* CORPT) and rule of law (IR* R_LAW and IFRS3* R_LAW). The variables of interest (i.e. IR* CORPT, IFRS3*CORPT, IR*R_LAW and IFRS3*R_LAW) have significantly negative coefficients. The association between IR compliance and IFRS 3 disclosure quality and cost of equity seems to be affected by the level of control of corruption of the country. Specifically, IR compliance and IFRS 3 disclosure quality produce higher effects, that is, contribute to reduce more the cost of equity, in countries where there is control over corruption and have developed better perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Furthermore, the rule of law seems to negatively affect the relation between IR compliance and IFRS 3 disclosure quality and cost of equity. IR compliance and IFRS 3 disclosure quality is more intense in countries are founded on principles and rules. The characteristics of countries with high sense of the rule of law stem from the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

In Panel B of Table 7, we estimate equation (3) again, using an alternative IFRS 3 disclosure score index (IFRS3_R), which is based on Street and Gray (2002) and Amiraslani, et al. (2013) and an alternative IR disclosure score index (IR_R) based on Demmer, et al. (2019). The results of political factors are almost the same to those of our basic analysis presented in Panel A. In robust analysis is not verified the statistical significance of IR_R*R_LAW and of IFRS3_R*CORPT. At the same time, the statistical significance of IR_R* CORPT is strengthened.

Table 7
Cost of equity and political factors

Panel A Equation (4)			Panel B – Robust Analysis of Equation (4)		
Variable	Coefficients	T –stat.	Variable	Coefficients	T–stat.
Intercept	0.4070***	3.1790	Intercept	0.2214***	2.5243
PREPOST	-1.3622***	-2.8149	PREPOST	-1.3774***	-2.7534
IR	-0.3142***	-3.1177	IR_R	-0.2674**	-2.4977
IFRS3	-0.5038***	-4.3417	IFRS3_R	-0.2963***	-2.8421
IR*IFRS3	-0.6773***	-2.9113	IR_R*IFRS3_R	-0.4221***	-3.1464
CORPT	-0.9251*	-1.9096	CORPT	-0.9634***	-2.7841
IR*CORPT	-0.0670*	-1.8839	IR_R*CORPT	-0.6543***	-2.8374
IFRS3*CORPT	-0.5186*	-1.9093	IFRS3_R*CORPT	0.3402	0.5522
RLAW	-1.6790***	-3.2193	RLAW	-1.4314**	-2.4901
IR*RLAW	-1.1404**	-1.9962	IR_R*RLAW	1.3699	0.1354
IFRS3*RLAW	-0.5525*	-1.8977	IFRS3_R*RLAW	-0.7474*	-1.9530
ROA(t-1)	0.0035	0.3920	ROA(t-1)	0.0035	0.3638
LEV (t-1)	0.0653***	3.1266	LEV (t-1)	0.0651***	3.3865
LnTA	-1.5229***	-2.9482	LnTA	-1.5749***	-3.1954
LnBIDSAK	-0.8851***	-3.7004	LnBIDSAK	-0.3655***	-3.5969
LOSS	0.2708**	1.9746	LOSS	0.2919	1.3311
AAWA	5.32E-	2.8869	AAWA	5.28E-05***	3.6098
Industry Eff.	Yes		Industry Eff.	Yes	
Year Eff.	Yes		Year Eff.	Yes	
Adj. R-sq	24.9515%		Adj. R-sq		
Sample size	N= 2,986		Sample size	N= 2,986	

4.4 Regression results for firm's risk, IR and IFRS 3

Table 8 presents the results of Eq. (5), confirming H3. We find that companies with high IFRS 3 disclosure score and high IR compliance have a negative impact on firms' risk. Our dependent variable is firm risk. We estimate firm's risk using three different risk variables. In Panel A we estimate Eq. (5) using BETA variable that captures the systematic risk (Breuer et al., 2018), in Panel B using SMOOTH variable that captures total firm risk (Francis et al., 2008) and in Panel C using Altman's Z score (Altman, 1993) that captures the risk of default (Chava, 2014). In Panels A, B and C the variables of interest (i.e. IR, IFRS3 and IR x IFRS3) have negative coefficients, suggesting that the informativeness that arises from the high level of disclosure quality of IR and IFRS 3 lower systematic risk, total risk and risk of default respectively. Confirming stakeholder theory, a company's engagement in IR activities serves as a controlling mechanism that ensures the implementation of interests of all the stakeholders. Some empirical studies suggest that active engagement of companies in IR activities makes them consider the interests of all stakeholders thereby supporting IR regime that also takes into account risks associated with all the stakeholders (Obeng et al., 2020). Our results are aligned to previous studies which have presented that negative association between CSR performance and the level firm's risk (Cheng et al., 2014; Chen et al., 2018). Focusing on control variables, in Panel A we find a negative relation between R(t-1) LnTA, LnBIDASK ROA(t-1) and the

systematic risk (BETA) confirming the findings of Jegadeesh and Titman (1993), Breuer et al., (2018), Christoffersen et al., (2018) and Beaver et al., (2005). In Panel B we find a positive relation between LEV(t-1) and LOSS and the total firm risk (SMOOTH) confirming the findings of Francis et al. (2008) and Badia, et al. (2020). Finally, in Panel C we find a negative relation between MBR and LnTA and the risk of default (Z_SCORE) confirming the findings of Chava (2014).

In Table 8 our robust analysis is presented in Panels D, E, and F. We estimate equation (5) again, using an alternative IFRS 3 disclosure score index (IFRS3_R), which is based on Street and Gray (2002) and Amiraslani, et al. (2013) and an alternative IR disclosure score index (IR_R) based on Demmer, et al. (2019). The results of robust analysis are almost the same to those of our basic analysis presented in Panel A, B and C. The variables of interest (i.e. IR_R, IFRS3_R and IR_R x IFRS3_R) still have significant and negative coefficients confirming again H3.

4.5 Regression results for cost of equity and firm's risk

Table 9 presents the results of Eq. (6), confirming H4. In Panel A, we observe that high levels of IR compliance and IFRS 3 disclosure quality lower cost of equity in firms with low levels of risk. In Panel A, the variables of interest that capture the systematic risk are the interaction terms IR*BETA and IFRS3* BETA, these that capture the total risk are IR*SMOOTH and IFRS3* SMOOTH and these that capture the risk of default are IR*Z_SCORE and IFRS3* Z_SCORE. All of the variables of interest have negative coefficients as we expected, suggesting that the informativeness that arises from the high level of disclosure quality of IR and IFRS 3 interacts with a reducing effect on firm risk and hence lowers equity costs. Our results support Lombardo and Pagano (2002) findings and suggest that the high level of transparency stems from greater disclosure financial and non-financial information reduces the monitoring costs for investors, who require a lower rate of return for their holding stocks. Our study confirms Gebhardt et al. (2001), Pastor et al. (2008), Chava and Purnanandam (2010) and Athanasakou et al., (2020). Gebhardt et al. (2001) find strong negative relationship between cost of equity capital and some firm-level characteristics such as LnBIDASK, LnTA and MBR.

In Panel B, we estimate equation (6) again, using an alternative IFRS 3 disclosure score index (IFRS3_R), which is based on Street and Gray (2002) and Amiraslani, et al. (2013) and an alternative IR disclosure score index (IR_R) based on Demmer, et al. (2019). The results of robust analysis are almost the same to those of our basic analysis presented in Panel A. The variables of interest (i.e. IR_R*BETA, IFRS3_R*BETA, IR_R*SMOOTH, IFRS3_R*SMOOTH, IR_R*Z_SCORE and IFRS3_R* Z_SCORE) still have significant and negative coefficients confirming again H4.

Table 8
Firm Risk, IFRS 3 disclosure quality and IR compliance

Basic analysis of Equation (5)							Robust analysis of Equation (5)						
Variable	Panel A BETA		Panel B SMOOTH		Panel C Z-SCORE		Variable	Panel D BETA		Panel E SMOOTH		Panel F Z-SCORE	
	Coefficien	T –	Coefficients	T –	Coefficients	T –		Coefficients	T –	Coefficien	T –stat.	Coefficien	T –
Intercept			0.2056***		0.2489***		Intercept	0.2448**	3.1445	0.8464**	3.3161	0.3212***	2.6419
PREPOST	0.0564		-0.0814**	-	-0.3449***	-3.2544	PREPOST	0.0513	0.8998	-	-	-0.4220***	-
IR	-	-	-0.3774***	-	-1.3925***	-3.6157	IR R	-1.1518**	-2.0166	-0.6769**	-	-1.6316*	-
IFRS 3	-1.1915**	-	-0.8584***	-	-1.3479***	-3.5821	IFRS 3_R	-1.1364*	-1.8056	-	-	-1.5131***	-
IFRS3* IR	-0.7162*	-	-0.7098***	-	-0.3430***	-3.4255	IFRS3_R*	-0.8694**	-2.1662	-	-	-0.2514**	-
R(t-1)	-	-	-8.31E-	-	-0.1695***	-3.0167	R(t-1)	-	-3.4965	-0.0059**	-	-0.0691***	-
ROA(t-1)	-0.0039*	-	-0.0012	-	0.2030	0.3602	ROA(t-1)	-0.0037*	-1.9250	-0.0411	-	-0.9023	-
LEV(t-1)	0.0006*		0.0015*		0.0002*	1.8837	LEV(t-1)	3.40E-05*	1.7709	-0.0023	-	-0.0612	-
LNTA	-	-	-0.0369***	-	-0.2190**	-2.1419	LNTA	0.0949	1.3849	-	3.1376	0.2133**	2.1841
LNBDASK	-	-	-0.2283	-	-0.3795***	-2.9962	LNBDASK	-	-3.3124	-0.1930	-	-0.4698***	-
LOSS			0.2953***		0.1056	0.3269	LOSS	-0.1696**	-1.9627	0.6575**	3.5024	-0.1166	-
SAI FS G	-6.03E-05	-	0.0002		1.92E-05**	-2.1419	SAI FS G	-6.93E-05	-0.0850	-0.0001**	-	-0.2755*	-
MBR	0.0004		-0.0012***	-	-0.0049***	3.2054	MBR	-	-3.0045	-0.0019*	-	-0.1840**	-
AAWA	1.72E-		0.0152		3.41E-	1.9627	AAWA	1.76E-10	0.8790	0.0253**	3.1526	0.0007*	1.8174
STDOI	0.0009**	4.4454	0.0001		0.1413*	1.9157	STDOI	0.0009**	3.3027	0.0016	1.2403	0.0493	1.1404
Ind. & Year	Yes/Yes		Yes/Yes		Yes/Yes		Ind. & Year	Yes/Yes		Yes/Yes		Yes/Yes	
Adj. R2	28.4070%		21.1749%		18.9853%		Adj. R2	25.5807%		24.9877%		21.5609%	
Sample size	N= 2,977		N= 3423		N= 3455		Sample	N=2,997		N= 3433		N= 3,415	

Table 9
Cost of equity and firm risk

Panel A Equation (6)			Panel B – Robust Analysis of Equation (6)		
Variable	Coefficients	T –stat.	Variable	Coefficients	T–stat.
Intercept	1.0094***	3.3568	Intercept	-1.0032***	3.3155
PREPOST	-0.1117***	-3.0324	PREPOST	-0.0893***	-2.6260
IR	-1.3003***	-2.6443	IR_R	-1.7121***	-3.0229
IFRS3	-1.2618***	-2.9365	IFRS3_R	-1.2090***	-3.1707
IR*IFRS3	-0.6773***	-2.9113	IR_R*IFRS3_R	-0.4000***	-3.0082
BETA	0.4424***	3.3456	BETA	0.4456***	3.6393
IR*BETA	-0.4462**	-2.4431	IR_R*BETA	-0.4347**	-2.5043
IFRS3*BETA	-0.0635**	-2.3868	IFRS3_R*BETA	-0.0513**	-2.5170
SMOOTH	0.0732*	1.9123	SMOOTH	0.0828***	3.5989
IR*SMOOTH	-0.0088***	-2.6626	IR_R*SMOOTH	-0.0077**	-2.0206
IFRS3*SMOOTH	-0.1602***	-2.8920	IFRS3_R*SMOOTH	-0.1156***	-2.8854
Z_SCORE	0.1724***	2.8493	Z_SCORE	0.1795***	3.6654
IR*Z_SCORE	-0.0548***	-3.3315	IR_R*Z_SCORE	-0.8608***	-3.4086
IFRS3*Z_SCORE	-0.0560***	-3.3551	IFRS3_R*Z_SCORE	-0.5975***	-3.1234
LnBIDSAK	-0.7501***	-3.0520	LnBIDSAK	-0.7142***	-3.2622
MBR	-0.1580***	-3.5288	MBR	-0.0720***	-3.4846
ROA(t-1)	-0.0066***	-2.6526	ROA(t-1)	-0.0113	-3.0353
LEV (t-1)	-0.0017***	-2.9260	LEV (t-1)	-0.0018	-2.1980
AAWA	0.2517***	2.9393	AAWA	0.2556***	2.9298
SALES_G	0.0077	0.8496	SALES_G	0.0030	0.3554
LnTA	-0.6712***	-3.2310	LnTA	-0.5863***	-3.2469
Industry Eff.	Yes		Industry Eff.	Yes	
Year Eff.	Yes		Year Eff.	Yes	
Adj. R-sq	28.4781%		Adj. R-sq	28.4865%	
Sample size	N= 2,986		Sample size	N= 2,986	

5 Conclusions

This study examines the relation of cost of equity associated with the disclosure quality of IFRS 3 and the IR compliance. First, we argue that companies with high IFRS 3 disclosure score and high IR compliance have a negative impact on cost of equity. We suggest the informativeness that arises from the high level of disclosure quality of IR and IFRS 3 lower equity costs. Our results support that investors and private lenders consider the environmental concerns of each company. Firms with strength IR consciousness have lower equity costs since not only investors take these issues into account but also and lenders who charge lower interest rates on bank loans to companies that gain from environmentally beneficial products (Chava, 2014).

Second in firms of countries with strong legal, cultural, and political factors, our results show that the cost of equity falls when a firm invests in IR and at the same time provides high levels of IFRS 3 information. The cost-of-equity-reducing effect of IR compliance in firms of

countries with high investor protection results particularly from the IR adoption and the informativeness of disclosure quality of IR and IFRS 3.

Third, we find that higher IFRS 3 disclosure score lowers firms' risk in companies with high IR compliance. Confirming agency theory about the informativeness power of disclosure quality, we suggest that the informativeness that arises from the high level of disclosure quality of IR and IFRS 3 lower systematic risk, total risk and risk of default respectively. Moreover, our results confirm stakeholder theory since a company's engagement in IR activities serves as a controlling mechanism that ensures the implementation of interests of all the stakeholders and IR that also takes into account risks associated with all the stakeholders (Obeng et al., 2020).

Finally, as stated out by Bhattacharya et al. (2012), previous studies (e.g., Barth et al., 2013) suggesting the relation between information quality and the cost of equity capital primarily to information asymmetry could be misleading. This study shows that a significant proportion of the effects are attributable to risks such as systematic risk, total risk and the risk of default. We find that the informativeness that arises from the high level of disclosure quality of IR and IFRS 3 interacts with a reducing effect on firm risk and hence lowers equity costs.

The findings of this study have far-reaching practical consequences for a stable strategy and financing policy for each firm that adopts IR. Our findings are consistent with stakeholder theory since IR improves the quality of financial and non-financial information and subsequently results in greater stakeholder confidence and more efficient and productive allocations of capital (Moroney et al, 2012). The mix of high IR compliance and IFRS 3 disclosure quality creates a closer engagement between investors and other stakeholders (Simnett and Huggins, 2015). Furthermore, what this study implies is that firms should opt to be transparent and to disclose high quality accounting information to their stakeholders as this can lead to improved decision making, to smooth firm risk and lower cost of equity and to the attraction of sophisticated investors. Future research may investigate the effects of IR on the quality of accountability of managers in countries with different institutional characteristics. Another objective for future research is to quantify the benefits of complying with IR and IFRS 3.

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