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NON-FINANCIAL REPORTING AND THE COST OF CAPITAL IN BRICS COUNTRIES

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NON-FINANCIAL REPORTING AND THE COST OF CAPITAL IN BRICS COUNTRIES[3]

This paper considers the impact of non-financial reporting (NFR) on the cost of capital (COC) in the forms of the cost of equity (COE), the cost of debt (COD), and the weighted average cost of equity (WACC). It was revealed that companies publishing non-financial reports have a lower COC. COD, COE, and WACC reduce after NFR. Six industries, where the cost of equity and debt capital is lower for companies publishing NFR, were determined: consumer discretionary, energy, industrials, information technology, healthcare, and materials. According to the analysis, companies that issued non-financial reports have a lower COE capital growth rate.

JEL Classification: G32, M40.

Keywords: non-financial reporting, CSR, cost of capital, BRICS countries.

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1. Introduction

Since the end of the last century, non-financial reporting (NFR) has become increasingly important due to internalization, digitalization, and the increased role of intangibles in company valuation. NFR covers environmental, social, and governance information [Yeh et al., 2019]. Initially, companies prepared reports about environmental and social responsibilities, but it was difficult to compare information, so some organizations created standards for NFR. The most popular are GRI (Global Reporting Initiative), IIRC (International Integrated Reporting Council), and SASB (Sustainability Accounting Standards Board). The purpose of voluntarily prepared non-financial reports is to show how an organization creates value over the short, medium, and long terms, which coincides with signaling theory [Bae, 2018], and reduces information asymmetry [Hung et al., 2013].

One of the most interesting questions regarding NFR is whether it is value relevant? Many authors have found positive correlations between NFR prepared according to different standards and company value, using and developing different approaches [Schadewitz (2010), de Klerk and de Villier (2012), Iatridis (2013), Dimson at el. (2015), Fatemi et al. (2015), Oshika (2015), De Villiers et al. (2017), Fuente et al. (2017), Albuquerque (2019)]. The endogeneity problem was raised in most of these studies: whether the firm's value has increased after NFR or companies with higher values issued non-financial reports? The authors used different methods to resolve this issue. Another branch of studies investigates the quality of information disclosed which can be measured through the number of points disclosed in the report [Dhaliwal et al., 2011], the presence of NFR assurance [Cohen and Simnett, 2015], and ratings [Dorfleitner et al. (2015), Gao et al. (2016)]. However, the current paper considers only the presence of NFR, and this is a limitation of the study.

When a positive relationship between company value and NFR was proven in many papers, researchers began studying more detailed aspects of NFR. Such topics as earnings quality improvement [García-Sánchez and Noguera-Gámez, 2017], attractiveness for institutional investors [Dhaliwal et al., 2011], a reduction in information asymmetry [El Ghoul et al., 2011; Cho et al., 2014] and risk reduction [Nguyen and Nguyen, 2015] were considered in connection with NFR. But the dependence of the cost of capital on NFR is still being studied [Suto and Takehara, 2017; Bhuiyan and Nguyen, 2019; Savi et al., 2020; Yen et al., 2020]. Also, other terms are used instead of NFR, such as CSR (corporate social responsibility), ESG (environment, society, and governance), or IR (integrated report), but similar methodologies are used.

Classically company value can be measured as the sum of discounted cash flows [Copeland et al., 1994]. This research does not consider the cash flow aspect but concentrates on discount factors—the cost of capital (COC) in the forms of the cost of equity (COE), cost of debt (COD), and the weighted average cost of capital (WACC). Some authors have revealed a positive relationship between COC, in different forms, and NFR using different samples: El Ghoul et al. (2011) in the US,

Suto and Takehara (2017) in Japan, Bhuiyan and Nguyen (2020) in Australia, Yen et al. (2020) in China. We consider a multinational sample of developing countries: Brazil, Russia, India, China, and South Africa (the BRICS countries). Earlier multinational samples were analyzed to test the relationship between COC and NFR (Dhaliwal, 2012, 2014; García-Sánchez and Noguera-Gámez, 2017). In China and South Africa NFR is mandatory (Ioannou & Serafeim, 2017). The effects of obligatory NFR are estimated differently. On the one hand, Ackers and Eccles (2015) found that the mandatory NFR requirements for public companies in South Africa imposed by the King Code on Corporate Governance (King III, 2009) led to weaknesses of stakeholders' certainty. Manchiraju and Rajgopal (2017) investigated the impact of the Indian Companies Act (2013) which obliged large firms in India to spend at least 2% of net income on CSR and revealed that this led to a reduction in shares price of 4%. Other authors highlighted that when firms can choose their optimal CSR expenditures, it maximizes their value. Ioannou and Serafeim (2017) demonstrated the correlation between a company's value growth and mandatory NFR which shows a decrease in information asymmetry.

There are some reasons for a reduction in COC caused by NFR. First, according to agency theory, it reduces a corporation's environmental risk and the information asymmetry between shareholders and management, and between the company and potential investors (Jensen and Meckling, 1976). Second, according to signaling theory, investors cannot accurately predict the future earnings of a company, but they are interested in those companies which can provide more information to estimate future earnings. If a company makes high-quality signals about expected earnings, investors will be ready to provide capital at a lower rate because they estimate its risk as lower than the industry average (Hahn and Kühnen, 2013). Therefore, the main goal of this study is to test the significance of NFR for COC.

Using a sample of 1,038 firms from the BRICS countries, 2007–2017, we examine the relationship between NFR prepared according to GRI, IIRC, SASB, and other standards, and COE, COD, and WACC. We found a negative relationship between NFR publication and COC, a decrease in COC after non-financial information (NFI) disclosure and a reduction in the COE growth rate after NFR. These results are consistent with previous studies and theories and contribute to the literature in several ways. First, according to our knowledge, this study is the first which analyzed the reaction of the Russian capital market to NFR using COC, and as an international sample was used the results may be relevant for other developing countries. Second, COC was considered in 3 forms: COE, COD, and WACC, when usually only COE and COD are analyzed. Third, a dynamic model was tested and revealed a decrease in the COE growth rate.

The current study contains 5 parts. Part 1 is an introduction, part 2 contains a literature review and hypotheses formulation. Part 3 contains the models, which have been modified to test the

hypotheses, and a description of the general sample. The results are presented in part 4, the conclusion and ideas for further research are in part 5.

2. Literature review and hypotheses formulation

Nowadays, NFI is very important to maintain stakeholder's confidence at all levels, because the less somebody trusts, the greater the incentive they have to switch to another partner or producer. Before a detailed literature review let us consider what incentives a company has to report NFI. Clarkson *et al*. (2008) suggested two theoretical explanations: economic theory and socio-political theory. Economic theory suggests that a firm preparing a detailed sustainability report receives a competitive advantage both in comparison with competitors who prepared poorer reports and by monitoring additional indicators. Socio-political theory considers information disclosure as a manipulative mechanism for persuasion that the ''plural user group'' controls company performance. Companies with lower environmental and social performance are interested in increasing less relevant information, to change society's perception of the company. Based on these theories, the authors concluded that stakeholders consider firms with a low level of NFR negatively because information omission can be understood as an attempt to hide deviations from optimal behavior. Campbell (2007) highlighted 8 highly cited propositions about the firm's motives for NFR. He noticed that companies are more likely to behave in a socially responsible way if (a) it is in a country with strong and well-enforced state regulations, (b) there is a system of well-organized and effective industrial self-regulation, (c) the calls for such behavior are institutionalized, (d) it is a private, independent organization; (e) it belongs to trade or employer associations promoting socially responsible behavior, (f) it is engaged in institutionalized dialogue with unions, employees, community groups, investors, and other stakeholders. A company will prefer to behave opportunistically if its financials are unstable and there is too much or too little competition. From an empirical point of view, Dhaliwal *et al*. (2012) referred to motives for GRI reporting in 31 countries and showed that the effect of NFR is stronger in countries where CSR performance can affect a firm's financial performance and in countries with obscure financial rules.

Frankel *et al*. (1995) was one of the earlier papers considering the impact of voluntary NFR on COC. They found that the higher the level of voluntary disclosure, the lower the COC in the future. Lambert *et al*. (2007) identified that COE can be affected by reducing the information asymmetry between the company and its investors. The high quality of accounting information can decrease COC directly and indirectly. The direct effect is determined by cash flow. The indirect effect influences the firm's decision-making process first of all, which has an impact on real business situations. The NFI can be positive or negative, but, as the authors showed, all additional data affects COC.

Dhaliwal *et al*. (2011) proved that firms disclosing CSR expenditures have a lower COE, and that CSR performance reduces information asymmetry. They then showed that a decreased COE attracts new institutional investors which allows company-initiated CSR disclosure to raise more equity capital. Reverte (2012) also found that CSR disclosure is negatively associated with COE. Three years later, Dhaliwal *et al*. (2014) studied the relationships between CSR disclosure and COE, comparing companies from 31 countries, combining two previous studies. Using the Corporate Register, they received NFI measurement. According to their results, there is a negative relationship between NFR and COE.

Dhaliwal's 2011, 2012, 2014 papers have become the basis for many studies. Zhou *et al*. (2017) showed that the higher the alignment with the integrated report's framework, the lower the COC. However, Bath *et al*. (2017) extended their earlier research (Bath *et al*., 2016) by considering the NFR quality in the form of the impact of integrated reports on different financial indicators separately. In the sample of South African companies, they found positive effects of NFR quality on liquidity and expected future cash flows and no relationship with COC. Mokhova *et al*. (2018) highlighted NFR as one of the COE determinants. However, Humphrey *et al*. (2012) found no relationship between NFR and COC.

Stellner et al. (2015) studied whether CSR performance is connected with lower credit risk. They found weak relationships but concluded that CSR practice reduces corporate bond z-spreads if a company is domiciled in a country with a high ESG rating. Ge and Liu (2015) proved that a higher CSR score is associated with a lower yield spread. Sustainability, according to our view, is the ability to meet liabilities, regardless of the conditions in the market. It is especially important, therefore, to track how sustainable firms overcome crises. Cornett (2016) studied banks' financial indicators during the 2008–2009 crisis and their relationship with CSR practice. He found that banks which invest in sustainable firms (with a high CSR score) were more stable and had lower losses during the crisis. Bhuiyan and Nguyen (2019) and Yeh *et al*. (2020) detected negative relationships between CSR performance quality and COE and COD in Australia and China respectively.

From Dhaliwal *et al*. 2011, 2012, 2014; Steliner et. al. (2015); Bhuiyan and Nguyen (2019); and Yeh *et al*. (2020), we assume that NFR is negatively associated with COE and COD. Consequently, it should be negatively correlated with WACC (Suto and Takehara, 2017).

H1: COE, COD, and WACC are lower if the company published NFR.

Sletten (2012) confirmed that a fall in the stock price implies an increase in COE and induces managers to disclose more information. She also confirmed that publicly available information is biased, because managers prefer to release only good news. She found that a fall in the stock price

reflects hidden negative information and demonstrates that the market takes insiders information into account also, but with a time lag. Hajawiyah *et al*. (2019) studied Indonesian firms and proved that firms that issued NFR have a lower COE the year after report publication.

H2: COE, COD, and WACC decrease after NFR publication.

Some previous papers found different effects from CSR practices across industries and explained the logic behind it. For example, Hong and Kacperczyk (2009), proved that large institutional investors neglect sin shares involved in gaming and producing alcohol or tobacco, which have a 19.3% higher leverage ratio than a typical company. The nonparticipation of institutional investors occurs with a significant negative price effect on the order of 15–20%. Clarkson *et al*. (2008) highlighted the importance of NFR in environmentally dangerous industries, we include these in the list of NFR-sensitive industries which we determine in the current study. Prado-Lorenzo and García-Sanchez (2010), Hahn and Kühnen (2013), Cho *et al*. (2014), Sierra-García *et al*. (2015), and Kuzey and Uyar (2017) noticed that NFR has a different significance across industries.

H3: COE and COD decreased after NFR only in NFR-sensitive industries.

To justify the fourth hypothesis, we expand the existing empirical results related to nominal COC (measured in percentage points) to the COC growth rate. Mathematically COC growth can be calculated as $\Delta\,\mathrm{COC} = COC_t - \mathrm{COC}_{t-1}$.

Based on the literature, we suppose there is a negative relationship between COC growth rate and NFR, consequently, independently from the direction of changes in COC, NFR should also reduce the COC growth rate.

H4: NFR decreases the COC growth rate.

Now when all hypotheses are explained and formalized, we can move to the models' descriptions and sample descriptive statistics.

3. Methodology

3.1 Model

COC consists of COD and COE. For COE estimation we used the capital asset pricing model (CAPM) [Fama & French, 1992]:

$$COE = r_f + \beta * (r_m - r_f),$$

where r_f is the risk-free rate measured as 10-year government bond returns, r_m is the market index returns, and $\beta = \frac{cov(COE, r_m)}{var(r_m)}$ is a systematic risk measure.

For testing the hypotheses, we created a modified model, based on El Ghoul (2011), Boujelbene and Affes (2013), and Anderson *et al*. (2004). The necessity of such variables as size, leverage, and market to book ratio, were firstly confirmed by Fama and French (1993). Long-term growth (LTG) is taken from Dhaliwal (2011) and Zhou *et al*. (2017). Bhuiyan and Nguyen (2019) used β as an explained variable, but we decided to not take it into account as β is used for calculating COE.

The equation for the cost of equity (COE) estimation:

$$COE_{i,t} = \beta_0 + \beta_1 NFR_{i,t} + \beta_2 Size_{i,t} + \beta_3 MB_{i,t} + \beta_4 Lev_{i,t} + \beta_5 LTG_{i,t} + \beta_6 ROA_{i,t} + \sum_{j-1} Industry_j + \sum_{t-1} Year_t + \sum_{k-1} Country_k + \varepsilon_{i,t}.$$

Based on Chan et al. (2017), the Altman z-score was added to the models for COD. COD was calculated as the sum of long and short debt rates weighted on debt shares in total debt.

$$COD = \frac{Long-term\ Debt}{Total\ Debt} * r_{d\ LT} + \frac{Short-term\ Debt}{Total\ Debt} * r_{d\ ST},$$

where $r_{d\ LT}$ is the rate for long-term debt, $r_{d\ ST}$ is the rate for short-term debt.

The equation for calculating COD is:

$$COD_{i,t} = \beta_0 + \beta_1 NFR_{i,t} + \beta_2 Size_{i,t} + \beta_3 MB_{i,t} + \beta_4 Lev_{i,t} + \beta_5 LTG_{i,t} + \beta_6 ROA_{i,t} + \beta_7 Altman\_z_i + \sum_{j-1} Industry_j + \sum_{t-1} Year_t + \sum_{k-1} Country_k + \varepsilon_{i,t}.$$

The models were estimated using the panel OLS method for H1–H3 and the dynamic approach (Arellano-Bond estimation) for H4. The proxy for NFR is changed according to the hypotheses.

Table 1. Variables description for Cost of capital models.

Variable	Description
$Cost\ of\ capital_{i,t}$	1) COE - Cost of equity estimated by the CAPM; 2) COD - Cost of debt equals the proportion of long and short debt in total debt multiplied on the debt rates; 3) WACC - Weighted average cost of capital is the weighted combination of cost of equity and cost of debt; 4) ΔCOE - Cost of equity growth rate: $COE_{i,t} - COE_{i,t-1}$
$NFR_{i,t}$	Proxies for non-financial report: 1) Dummy variable equals 1 if a company has a non-financial report in the current year and 0 otherwise; 2) Lag of NFR dummy; 3) "After NFR" variable equals 1 for all periods after the moment when the firm issued the first non-financial report.
$Size_{i,t}$	The natural logarithm of the company's total assets at the end of each fiscal year;
$MB_{i,t}$	The market-to-book ratio at fiscal year-end;
$Lev_{i,t}$	The ratio of total debt divided by total assets;
$LTG_{i,t}$	Long term growth rate is the average of the 3 years sales growth;
$ROA_{i,t}$	Return on assets calculated as net income divided by total assets at the end of the fiscal year;
$Altman\ Z\ score_i$	Creditworthiness index calculated as a linear combination of current liquidity ratio (current assets/current liabilities) and capitalization coefficient ((long-term liabilities + short-term liabilities)/equity) at the end of the fiscal year;
$Industry_j$	Dummy variables for industries, may be included for 9 industries, the base value is undefined industry includes multi-industries corporations;
$Country_k$	Dummy variables for countries, may be used for 4 countries, the base value is China because firms from this country take up more than half of the sample;
$Year_t$	Dummy variables for years included if significant.

Source: authors' analysis

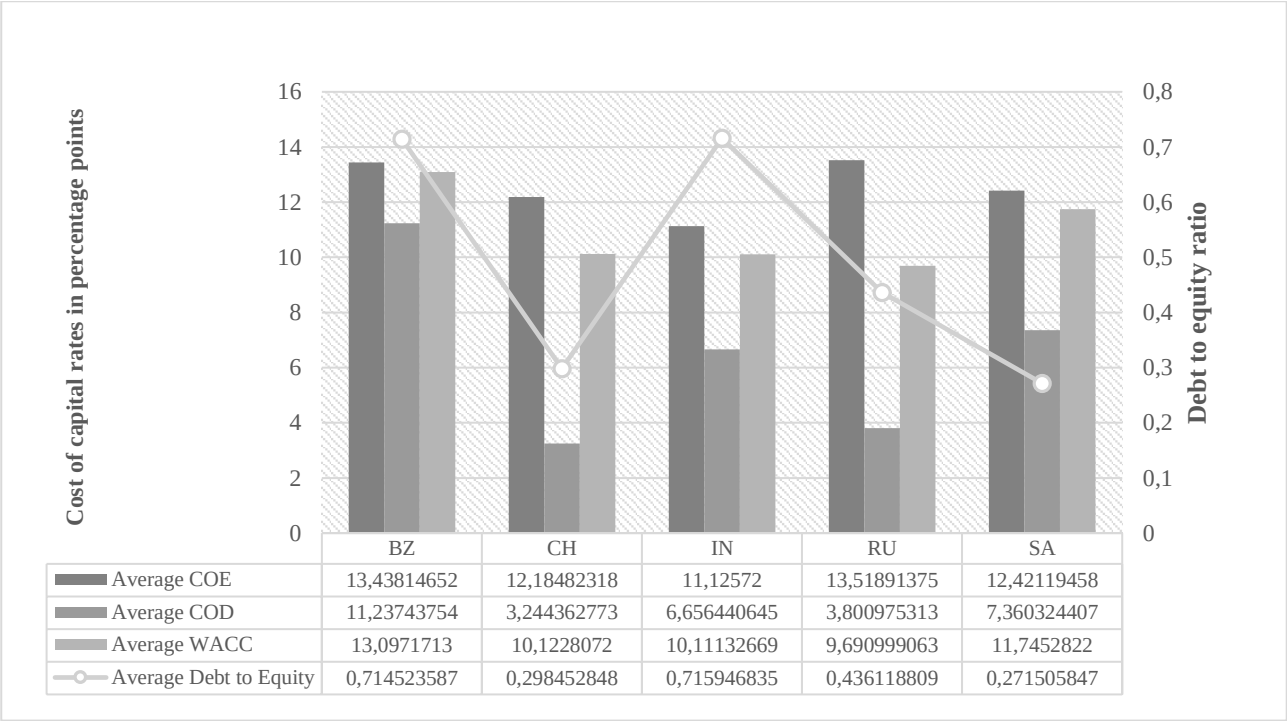
3.2 Sample

The sample contained listed companies from Brazil, Russia, India, China, and South Africa between 2007 and 2017. Financial data was gathered from the Bloomberg database (in USD according to IFRS), which only included fully disclosed figures for 2009–2016. Information about the presence of NFR and its type (GRI, IR, or other) was taken from GRI, through a special dataset available for students. The sample consists of 1,038 firms and 9,516 firm-year observations. Companies from China make up more than half of the sample. The sample contains observations from 10 sectors according to Global Industry Classification Standard (GICS) codes: consumer discretionary, consumer staples, energy, health care, industrials, information technology, materials, telecommunication services, undefined industry, utilities; and numerous subsectors. The financial sector was excluded due to the different balance sheet structure.

Table 2. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Cost of equity	9,516	12.07	2.95	0.56	21.99
Cost of equity growth rate	8,224	0.53	2.83	-9.04	12.02
Cost of debt	9,516	4.59	3.28	0	16.98
WACC	9,516	10.29	2.85	0.6586	19.92
Non-financial report	9,516	0.17	0.38	0	1
L. Non-financial report	8,224	0.15	0.36	0	1
After_NFR	9,516	0.19	0.39	0	1
Size	9,516	6.85	1.50	2.25	11.60
ROA	9,516	5.11	7.11	-89.16	65.38
Leverage	9,516	2.73	1.75	1.03	36.29
Long term growth	7,702	8.09	12.19	-57.84	182.99
Market to book ratio	9,516	2.86	1.99	0.05	9.99
Altman Z-score	9,516	4.14	4.26	-5.1	34.83

COC differs among the BRICS countries. COE is approximately the same, but the COD differs dramatically: in China and Russia, it is less than 4%, and in Brazil, it is over 11%. COD is lower than COE, which is in line with capital structure theory, assuming that debt is a less risky type of capital. In dependence on the debt share WACC value differs.



	BZ	CH	IN	RU	SA
Average COE	13,43814652	12,18482318	11,12572	13,51891375	12,42119458
Average COD	11,23743754	3,244362773	6,656440645	3,800975313	7,360324407
Average WACC	13,0971713	10,1228072	10,11132669	9,690999063	11,7452822
Average Debt to Equity	0,714523587	0,298452848	0,715946835	0,436118809	0,271505847

Fig. 1. The average cost of capital across countries.

Source: *authors' calculations*

We concluded that dummies for countries are necessary for the correct model specification.

COC does not dramatically differ across industries, however the debt-to-equity ratio (D/E) does, which is why dummy variables for industries were introduced.

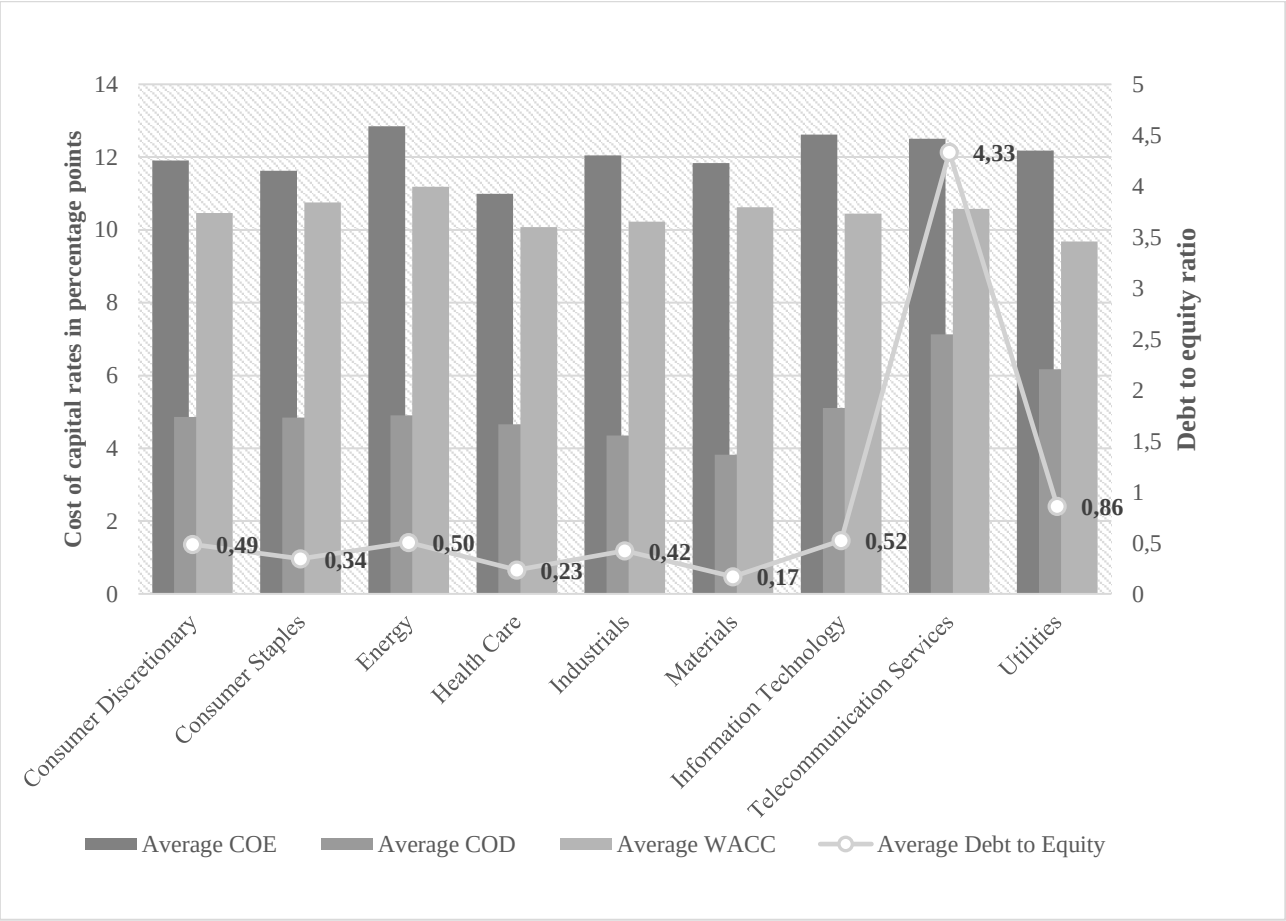


Fig. 2. The average cost of capital across industries.

Source: *authors' calculations*

COE capital differs from year to year, from 8% in 2007 to 15% in 2011 and requires dummy variables for years. COD is stable among years, WACC duplicates the COE dynamic. The covariance matrix is in Appendix 1.

Based on this sample, subsamples for models are formed. For the model in the first difference, observations from 2007 were not taken into account, as they were used for gain/loss calculation between 2007 and 2008.

4. Results

4.1 Static models

Initially, we estimated 2 panel OLS regressions with fixed and random effects and chose a model with fixed effects for COE, WACC, and COD to take into account individual firm effects. Three proxies for NFR were tested: (1) the dummy for NFR equals 1 if the report was issued in the current year, and 0 otherwise; (2) the first lag of NFR equals 1 if the report was issued in the previous year, and 0 otherwise; (3) the variable "After NFR" equals 1 for all years after the first NFR publication, and 0 before publication which allows a comparison of the average values of the

explained variables before and after NFR publication.

4.1.1 H1 and H2. Dummies for NFR and a lag of NFR

First, to check H1, that firms published NFR have lower COC, we estimated Model 1. COE, WACC, and COD were estimated using a fixed-effects model. For COD, information about a companies' Altman Z-score was included to take into account bankruptcy probability. The inclusion of credit ratings in the model for COD makes almost all variables insignificant.

To test H2, about the impact of a lag, the second proxy for NFR, which is the lag of NFR, was included in Model 2. To determine the nature of the influence and to conclude for long the effect of NFR lasts, we tested Model 3 including dummies for NFR and its first lag.

COE is measured by the CAPM model. COD is weighted by long- and short-term debt rates. WACC is a weighted sum of COE and COD. The results confirm H1 and H2: companies publishing NFI have lower COC; COC reduced a year after NFR publication. The lag impact may be explained by market inefficiency, investors need time to assimilate information and to change their company valuation. NFR reduces COC, not due to environmental and social disclosure and not by itself, it is just a proxy for numerous non-financial aspects, like intellectual capital, brand value, reputation, and, of course, sustainability. NFR is a signal that a company is sustainable or tries to behave in this way, and investors react to it because they trust less risky projects and want to generate long-term profit. Model 3 shows that a reduction in COC increases if company continues NFR. The inclusion of second and third order lags reveals the insignificance of their impact.

Regarding the interpretation of the results, we found that companies publishing NFR have 0.5 percentage point lower COE and WACC, and 0.4 percentage point lower COD in comparison with companies which did not disclose NFI. The presence of NFR in previous year decreases COE and COD by 0.6 percentage points and COD by 0.4 percentage points. The publication of NFR for 2 consecutive years leads to a decrease in COE and WACC by 0.8 percentage points, and in COD by 0.55 percentage points.

Table 3. Models 1-3. Impact of financial indicators, a dummy for NFR, and lag of NFR on COC with corrected heteroscedasticity.

	Model 1			Model 2			Model 3		
VARIABLES	COE	WACC	COD	COE	WACC	COD	COE	WACC	COD
Non-financial report	**-0.520*** **	**-0.543*** **	**-0.388*** **				**-0.308** **	**-0.351*** **	**-0.235** **
Standard error	(0.131)	(0.126)	(0.102)				(0.143)	(0.129)	(0.110)
L.Non-financial report				**-0.630*** **	**-0.599*** **	**-0.437*** **	**-0.479*** **	**-0.427*** **	**-0.322** **
Standard error				(0.140)	(0.134)	(0.119)	(0.149)	(0.133)	(0.126)
Size	-0.547***	-0.968***	-0.270***	-0.637***	-1.057***	-0.371***	-0.630***	-1.049***	-0.365***
Standard error	(0.105)	(0.109)	(0.0918)	(0.118)	(0.124)	(0.0994)	(0.118)	(0.124)	(0.0991)
ROA	-0.00200	0.0235***	-0.0205***	-0.00259	0.0233***	-0.0194***	-0.00252	0.0234***	-0.0194***
Standard error	(0.00587)	(0.00671)	(0.00616)	(0.00627)	(0.00738)	(0.00637)	(0.00627)	(0.00739)	(0.00636)
Leverage	0.0989***	-0.168**	0.166***	0.0985***	-0.181*	0.202***	0.0989***	-0.181*	0.202***
Standard error	(0.0288)	(0.0775)	(0.0380)	(0.0333)	(0.0986)	(0.0392)	(0.0334)	(0.0989)	(0.0392)
Long term growth	-0.000928	-0.000164	0.00297*	-0.00178	-0.000353	0.00350	-0.00179	-0.000358	0.00350
Standard error	(0.00225)	(0.00224)	(0.00161)	(0.00314)	(0.00305)	(0.00226)	(0.00314)	(0.00305)	(0.00226)
Market to book ratio	-0.228***	0.0601***	-0.0845***	-0.247***	0.0581**	-0.0991***	-0.246***	0.0585**	-0.0988***
Standard error	(0.0210)	(0.0227)	(0.0190)	(0.0225)	(0.0243)	(0.0201)	(0.0225)	(0.0243)	(0.0201)
Altman Z-score	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	14.77***	15.52***	5.635***	15.29***	16.03***	6.146***	15.26***	15.99***	6.121***
Standard error	(0.678)	(0.657)	(0.576)	(0.758)	(0.723)	(0.628)	(0.756)	(0.721)	(0.626)
Observations	7,702	7,657	7,657	7,356	7,316	7,316	7,356	7,316	7,316
R-squared	0.398	0.360	0.089	0.400	0.359	0.094	0.400	0.360	0.095
Number of Id	1,038	1,031	1,031	1,026	1,019	1,019	1,026	1,019	1,019

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculation

Company size, measured as the natural logarithm of total assets, has a negative impact on all three types of COC at 1% significance: the larger the company, the lower the cost of capital. Financial leverage and ROA have different impacts on COD, COE, and WACC. Leverage, measured as total debt to total assets, occurs with a positive impact on COE and COD, because the higher the company's debt, the riskier it is perceived to be, and new investors require higher compensation. Leverage has a negative impact on WACC, which can be surprising at first view, however, WACC is a linear combination of COE, the values of which are higher than COD, and COD. Consequently, despite the risks increasing with the debt share, it also makes capital cheaper (WACC lower), due to the significant gap between COE and COD average values (COE>COD). The ROA beta coefficient decreases COC and COD, as the more profitable the company, the lower the risk and greater the value for shareholders, which allows investors to decrease requirement rates. However, ROA increases WACC. A possible explanation is that large and mature companies, whose ROA is higher, prefer equity financing, which is more expensive. A positive sign for the market-to-book ratio in the equation for WACC also confirms the suggestion about equity financing preferences.

The second difference is the sign of long-term growth (LTG) between the COE and COD models. LTG decreases COE because investors agree to get less now if they know that in the future they will get more. Debt holders, however, would not get a share of future income as almost every debt has a settlement date. Therefore, the positive sign in the COD model demonstrates that, to support a high LTG rate, more capital is needed. If a company makes a decision to raise it as debt, the borrower understands that in the future the company will earn more and will re-distribute its profit intertemporally. The second possible explanation is that a high LTG rate is normal for young companies, in which flows are unstable and riskier, which makes borrowers increase their required rates. Also, the absence of credit history is logically connected with young, fast-growing companies, which may be reflected in the positive sign of LTG in the COD model.

However, the results require a resolution of the endogeneity problem. Did the company issue a report and its COC subsequently decreased, or was the COC low and then the decision to make a report was made? To check that COC decreases after an NFR publication, Model 4 was estimated, using a variable equal to 1 for all years after the first NFR. COE, WACC, and COD were estimated using fixed-effects regressions.

Table 4. Model 4: the impact of financial indicators and dummy variable "After NFR" on COC with corrected heteroscedasticity.

VARIABLES	COE	WACC	COD
After NFR	**-0.507*** **	**-0.601*** **	**-0.432*** **
Standard error	(0.133)	(0.128)	(0.112)

Size	-0.549***	-0.968***	-0.270***
Standard error	(0.105)	(0.109)	(0.0917)
ROA	-0.00233	0.0231***	-0.0208***
Standard error	(0.00586)	(0.00671)	(0.00616)
Leverage	0.0994***	-0.167**	0.166***
Standard error	(0.0289)	(0.0774)	(0.0379)
Long term growth	-0.00101	-0.000268	0.00289*
Standard error	(0.00225)	(0.00223)	(0.00159)
Market to book ratio	-0.229***	0.0597***	-0.0849***
Standard error	(0.0209)	(0.0227)	(0.0190)
Altman Z-score	No	Yes	Yes
Country effects	Yes	No	Yes
Industry effects	Yes	No	Yes
Year effects	Yes	Yes	Yes
Constant	14.79***	15.54***	5.646***
Standard error	(0.682)	(0.659)	(0.576)
Observations	7,702	7,657	7,657
R-squared	0.398	0.360	0.089
Number of Id	1,038	1,031	1,031

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculation

These results are a type of double-check of the previous models. They show that, on average, the COC falls after NFR. These results again confirm H2 and resolve the endogeneity problem. They show that for all periods after NFR publication COE falls by 0.5 percentage points, WACC by 0.6 percentage points and COD by 0.4 percentage points.

4.1.2 H3. Industry analysis

To check H3, regressions were tested separately for 9 different industries: Consumer Discretionary, Consumer Staples, Energy, Health Care, Industrials, Materials, Information Technology, Telecommunication Services, and Utilities. This was done to identify industries for which NFI disclosure is important. We ran 54 regressions for COE and COD as explained variables, for 9 sectors and 3 proxies for NFI disclosure: the presence of NFR (0/1), lag of NFR presence (0/1), and variable "After non-financial report" (0/1). All regressions are significant but differ in results. They are especially poor for Telecommunication Services. We do not analyze WACC because regression for WACC is weakly robust (see *4.3*). We can conclude that COE decreases in reaction to NFR in Consumer Discretionary, Energy, Health Care, Industrials, Materials, and Information Technology industries. COD decreases in Health Care, Industrials and Materials. This is logical because the latter industries are connected with threats to the environment or health. Companies from Industrials, Energy and Materials are factories, extractive companies, and power stations that can damage the environment incurring fines. Health Care and Consumer Discretionary also may be potentially dangerous not for the environment, but for human

health. The products of these industries must be tested many times and NFR reveals this information in detail and allows investors to predict the income of these firms, which decreases risks and COC. So, it's important for investors to know that companies from these sectors behave in a sustainable way, use reliable cleaning technologies, produce no dangerous products, and don't defy the laws.

Table 5. Cost of equity industry analysis.

Variable/ Industry	Consumer Discretionary	Consumer Staples	Energy	Health Care	Industrials	Materials	Information Technology	Telecommunication Services	Utilities
NF Report	-0.387	-0.273	**-0.706***	**-0.830****	-0.307	0.158	-0.005	0.120	-0.048
Standard error	(0.368)	(0.352)	(0.411)	(0.336)	(0.216)	(0.233)	(0.677)	(1.090)	(0.359)
L.NF Report	**-0.669***	-0.353	-0.072	-0.531	**-0.649*****	**-0.609***	**-1. 055*****	-0.352	0.256
Standard error	(0.368)	(0.312)	(0.513)	(0.480)	(0.222)	(0.337)	(0.352)	(0.921)	(0.374)
After NFR	-0.547	-0.054	**-1.152***	-0.358	-0.331	**-0.535****	-0.134	0.772	0.618
Standard error	(0.415)	(0.313)	(0.646)	(0.318)	(0.221)	(0.253)	(0.635)	(1.220)	(0.445)
Min observations	1 251	708	283	651	1 908	1 714	634	111	482
Max R-squared	0.456	0.325	0.294	0.450	0.461	0.387	0.566	0.243	0.376
Min number of Id	176	93	44	79	259	217	81	16	59

*** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculation

Table 6. Cost of debt industry analysis.

Variable/ Industry	Consumer Discretionary	Consumer Staples	Energy	Health Care	Industrials	Materials	Information Technology	Telecommunication Services	Utilities
NF Report	-0.271	-0.374	0.164	**-0.388***	**-0.246***	-0.295	-0.0593	-0.0768	0.084
Standard error	(0.309)	(0.268)	(0.470)	(0.213)	(0.131)	(0.230)	(0.311)	(0.603)	(0.267)
L.NF Report	-0.0328	-0.508	-0.0055	-0.118	**-0.305***	**-0.390***	0.423	-0.592	-0.301
Standard error	(0.350)	(0.359)	(0.556)	(0.471)	(0.177)	(0.226)	(0.650)	(0.498)	(0.282)
After NFR	-0.339	-0.328	0.372	**-0.470***	**-0.304****	-0.444	0.0712	-0.330	0.206
Standard error	(0.267)	(0.268)	(0.457)	(0.254)	(0.149)	(0.280)	(0.335)	(0.615)	(0.297)
Min observations	1 393	631	316	577	2 132	1 716	569	100	482
Max R-squared	0.135	0.111	0.111	0.198	0.090	0.116	0.119	0.295	0.189
Min number of Id	176	92	44	79	259	217	81	14	59

*** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculation

In some regressions, a positive insignificant correlation between COC and NFR was found. To explain it, we note that we do not control for the content of NFR, we assumed that companies issue them as a signal that they behave in a sustainable way, and better than competitors, because they can generate cash flow for longer periods, however, this assumption may be incorrect.

4.2 Dynamic models

Initially, we planned to test models in the first differences for 3 types of capital: COE, WACC, and COD. Unfortunately, we received the correctly estimated equation only for the COE growth rate dynamic. The estimations of COD and WACC models in differences are the field for future studies.

Before the dynamic model estimation, we checked that the difference between companies which published NFR and those who did not is significant. We did a t-test on the mean (with different variances) comparing the COE growth rate of companies which issued NFR at least once and companies which never have.

Table 7. T-test on means for COE growth rate of companies with and without NFR.

	COE with NFR	*COE without NFR*
Mean	0,431	0,617
Variance	9,29	15,77
Observations	4 299	8 662
Hypothetical difference in means	0	
Df	10 789	
t-statistic	**-2,949**	
P(T<=t) one-sided	0,0016	
t critical one-sided	1,645	
P(T<=t) two-sided	0,0032	
t critical two-sided	**1,96**	

Source: authors' calculation

The test showed that the calculated t-statistic (-2.949) is lower in modulus than both one-side (1.645) and two-side (1.96) t-critical. It means that H0 about the similarity of samples is rejected.

The model was estimated in the first difference by a one-step dynamic panel data regression, using the Arellano-Bond generalized method of moments. The complexity of the dynamic panel data estimation is necessity to pass some tests for autocorrelation, Sargan or Hansen specification tests, and two tests for the validity of independent and partially correlated (with the model residuals) instruments. It shows the presence of a first-order autocorrelation, which is unavoidable white noise, which exists during the lag of the explained variable in the model. As independent instrument variables, a risk-free rate was measured as 10-year government bond returns or years to maturity, because both these variables are not dependent on the company's COE, but impact on it. As GMM instruments, all lags of leverage, beta, and total assets were used, because these factors not only explain COE, but also pre-determine its

value in previous periods. There is no second-order autocorrelation in models, GMM and IV instruments are valid at a 5% level of significance, and, according to the Hansen test, the instruments are valid, but less significant with the use of too many of them (weakened instruments).

Table 8. The dynamic model, in the first differences, is estimated using the Arellano-Bond approach with corrected heteroskedasticity.

VARIABLES	Δ Cost of equity		
Co_with_NFR	**-0.871***		
Standard error	(0.492)		
L.NF_Report		**-3.490*****	
Standard error		(1.164)	
After_NFR			**-2.100*****
Standard error			(0.254)
Δ Size	-2.155**		-0.945***
Standard error	(0.950)		(0.176)
Δ Market to book ratio	-0.396***	-0.235***	-0.286***
Standard error	(0.0459)	(0.0579)	(0.0408)
Δ Leverage	0.0999	0.127**	
Standard error	(0.0654)	(0.0624)	
Δ ROA	-0.0910***	-0.0642*	-0.168***
Standard error	(0.0284)	(0.0380)	(0.0283)
Δ Long term growth	0.0327**	-0.0500*	
Standard error	(0.0156)	(0.0284)	
Country effects	Yes	No	No
Year effects	Yes	Yes	Yes
Industry effects	No	No	No
Constant	2.554***	2.892***	2.205***
Standard error	(0.199)	(0.369)	(0.0705)
Observations	7,356	7,356	8,224
Number of Id	1,026	1,026	1,028

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculation

Dynamic panel analysis allows us to bypass robustness checks because, if the models satisfy the moment condition, then they are robust, as is the case with our regressions. The results confirmed H4, that NFR publication decreases COC in the form of the COE growth rate. The COE growth rate of companies which prepared NFR decreases by 0.87 percentage points, during the second year after the NFR publication COE growth rate decreases by 3.5 percentage points and for all periods after the first NFR issuing COE growth rate decreases by 2.1 percentage points.

4.3 Robustness check

The robustness check was done in 3 ways: including other variables in the model, discarding significant variables, and cutting the sample by 1–5%. This was only done for the main static models 1–3 (see Appendix 2). After the analysis, we can conclude that the COE 2 and WACC 3 models are not robust, and that COD and WACC 2 models are weakly robust. Other models are robust.

5. Conclusion and further discussion

This paper considers the impact of non-financial reporting (NFR) on the cost of capital (COC), in the forms of cost of equity (COE), cost of debt (COD), and the weighted average cost of capital (WACC). Following the literature, four hypotheses were generated and tested in different specifications of the modified model, based on the sample for 2007–2016, containing 1,038 companies from the BRICS countries.

We confirmed the *COC reduction for firms issuing NFR,* both in robust static models for COE, COD, and WACC, and in the dynamic model for COE. The impact of NFR with a one-year on the COC is only partially confirmed: it was confirmed in a dynamic model for COE, and in static models for COE, COD, and WACC. However, it is not robust for COE and weakly robust for WACC and COD in the static models. Interestingly, the reduction in COE and WACC is higher than in COD after NFR. However, the possible explanation may be that COE and WACC is higher than COD. Regarding industry analysis, NFR-sensitive industries were revealed: consumer discretionary, energy, industrials, information technology, materials, and health care. The fourth hypothesis on the reduction of the COE growth rate after NFR was confirmed.

The results are in line with Zhou *et al*. (2017), Suto and Takehara (2017), Bhuiyan and Nguyen (2019), and Yeh *et al*. (2020), but new regarding some points: (1) the testing of the lag effects of NFI disclosure in static models which partially resolved the endogeneity problem; (2) analyzing not only COE and COD, but also the relationship between WACC and NFR; (3) the study of the dependence of the COE growth rate on NFR, using the dynamic panel model (Arellano-Bond GMM). This paper provides empirical proof of the relevance of NFR to company value, which might be of interest to company management and investors.

There are some limitations of the study: measuring only the presence of NFR, not the quality of information disclosed and not considering cash flow, which is an important determinant of firm value. Numerous influencing factors make it more difficult to provide reasoning for changes in cash flow caused by NFR and to test it. On the one hand, we can imagine an increase in sales of “green” brands, but it is most widespread for the B2C (business to customer) transactions. B2B (business to business) differs dramatically, and it is hard to assume that, for example, an airline is ready to pay more for an aircraft because the steel used in its assembly was produced with minimal environmental pollution. It

also seems unrealistic to suggest that employees would accept a lower salary to work in a "green" company, or suppliers selling goods/services to such companies at lower prices. The effect, which would be interesting to test, according to our view, analyzing cash flow is sustainability which may be observable in crises such as the COVID-19 pandemic. The study also left many other fields for further investigation: (1) our post-estimation tests failed for dynamic models of COD and WACC; another specification might resolve this problem; (2) industry analysis sometimes gives very poor results, as in the case of Telecommunication services, so a separate investigation, including key industry factors, may be fruitful; (3) the quality of NFR is likely to have a significant impact on company value. There are 2 biases in our study: the first one relates to the sample which contains only companies from emerging countries, and it would be interesting to compare the results with COC changes in developed countries; the second one is connected with NFR in general: the problem is that companies have no incentives to disclose negative information. Even controlling for the quality of information disclosed would not resolve the problem caused by the difference between reported and actual company behavior. Unfortunately, even today we hear about cases of environmental pollution that are not reflected in NFR. The future of NFI investigation, according to our opinion, depends on the development of ESG indexes based not on information disclosed but on the actions of a company which are often unobservable or intentionally hidden.

References

1. Ackers, B., & Eccles, N. S. (2015). Mandatory corporate social responsibility assurance practices. *Accounting, Auditing & Accountability Journal*.
2. Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. *Management Science*, *65*(10), 4451-4469.
3. Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2004). Board characteristics, accounting report integrity, and the cost of debt. *Journal of accounting and economics*, 37(3), 315-342.
4. Bae, S. M., Masud, M., Kaium, A., & Kim, J. D. (2018). A cross-country investigation of corporate governance and corporate sustainability disclosure: A signaling theory perspective. *Sustainability*, 10(8), 2611.
5. Barth, M. E., Cahan, S. F., Chen, L., & Venter, E. R. (2016). The economic consequences associated with integrated report quality: early evidence from a mandatory setting. University of Pretoria, unpublished working paper, 1-45.
6. Barth, M. E., Cahan, S. F., Chen, L., & Venter, E. R. (2017). The economic consequences associated with integrated report quality: Capital market and real effects. *Accounting, Organizations and Society*, 62, 43-64.

7. Bhuiyan, M. B. U., & Nguyen, T. H. N. (2019). Impact of CSR on cost of debt and cost of capital: Australian evidence. *Social Responsibility Journal*.
8. Boujelbene, M. A., & Affes, H. (2013). The impact of intellectual capital disclosure on cost of equity capital: A case of French firms. *Journal of Economics Finance and Administrative Science*, 18(34), 45-53.
9. Camilleri, M. A. (2018). Theoretical insights on integrated reporting. *Corporate Communications: An International Journal*.
10. Campbell, J. L. (2007). Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility. *Academy of management Review*, *32*(3), 946-967.
11. Chan, C. Y., Chou, D. W., & Lo, H. C. (2017). Do financial constraints matter when firms engage in CSR?. *The North American Journal of Economics and Finance*, *39*, 241-259.
12. Cho, C. H., Michelon, G., Patten, D. M., & Roberts, R. W. (2014). CSR report assurance in the USA: An empirical investigation of determinants and effects. *Sustainability Accounting, Management and Policy Journal*.
13. Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, organizations and society*, 33(4), 303-327.
14. Cohen, J. R., & Simnett, R. (2015). CSR and assurance services: A research agenda. *Auditing: A Journal of Practice & Theory*, *34*(1), 59-74.
15. Copeland Thomas, E., Koller, T., & Murrin, J. (1994). Valuation: measuring and managing the value of companies. *Wiley frontiers in finance.*
16. Cornett, M. M., Erhemjamts, O., & Tehranian, H. (2016). Greed or good deeds: An examination of the relation between corporate social responsibility and the financial performance of US commercial banks around the financial crisis. *Journal of Banking & Finance*, 70, 137-159.
17. de Klerk, M., & de Villiers, C. (2012). The value relevance of corporate responsibility reporting: South African evidence. Meditari Accountancy Research,20(1), 21-38.
18. De Villiers, C., Venter, E. R., & Hsiao, P. C. K. (2017). Integrated reporting: background, measurement issues, approaches and an agenda for future research. *Accounting & Finance*, 57(4), 937-959.
19. Dorfleitner, G., Halbritter, G., & Nguyen, M. (2015). Measuring the level and risk of corporate responsibility–An empirical comparison of different ESG rating approaches. *Journal of Asset Management*, *16*(7), 450-466.

20. Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The accounting review*, 86(1), 59-100.
21. Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., & Yang, Y. G. (2012). Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review*, 87(3), 723-759.
22. Dhaliwal, D., Li, O. Z., Tsang, A., & Yang, Y. G. (2014). Corporate social responsibility disclosure and the cost of equity capital: The roles of stakeholder orientation and financial transparency. *Journal of Accounting and Public Policy*, 33(4), 328-355.
23. Dimson, E., Karakaş, O., & Li, X. (2015). Active ownership. *The Review of Financial Studies*, 28(12), 3225-3268.
24. Eccles, R. G., Serafeim, G., & Krzus, M. P. (2011). Market interest in nonfinancial information. *Journal of Applied Corporate Finance*, 23(4), 113-127.
25. El Ghoul, S., Guedhami, O., Kwok, C. C., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital?. Journal of Banking & Finance, 35(9), 2388-2406.
26. Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *the Journal of Finance*, 47(2), 427-465.
27. Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of financial economics*, 33(1), 3-56.
28. Fatemi, A., Fooladi, I., & Tehranian, H. (2015). Valuation effects of corporate social responsibility. *Journal of Banking & Finance*, 59, 182-192.
29. Frankel, R., McNichols, M., & Wilson, G. P. (1995). Discretionary disclosure and external financing. *Accounting Review*, 135-150.
30. Fuente, J. A., García-Sánchez, I. M., & Lozano, M. B. (2017). The role of the board of directors in the adoption of GRI guidelines for the disclosure of CSR information. *Journal of Cleaner Production*, 141, 737-750.
31. Fuhrmann, S., Ott, C., Looks, E., & Guenther, T. W. (2017). The contents of assurance statements for sustainability reports and information asymmetry. *Accounting and Business Research*, 47(4), 369-400.
32. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.
33. Gao, F., Dong, Y., Ni, C., & Fu, R. (2016). Determinants and economic consequences of non-financial disclosure quality. *European Accounting Review*, *25*(2), 287-317.
34. García-Sánchez, I. M., & Noguera-Gámez, L. (2017). Integrated information and the cost of capital. *International Business Review*, 26(5), 959-975.

35. Ge, W., & Liu, M. (2015). Corporate social responsibility and the cost of corporate bonds. *Journal of Accounting and Public Policy*, 34(6), 597-624
36. GRI. (2013). Sustainability Reporting Guidelines Version 4.0: Reporting Principles and Standard Disclosures. Amsterdam: Global Reporting Initiative
37. Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research. *Journal of cleaner production*, 59, 5-21.
38. Hajawiyah, A., Adhariani, D., & Djakman, C. (2019). The sequential effect of CSR and COE: family ownership moderation. *Social Responsibility Journal*.
39. Hong, H., & Kacperczyk, M. (2009). The price of sin: The effects of social norms on markets. *Journal of financial economics*, *93*(1), 15-36.
40. Humphrey, J. E., Lee, D. D., & Shen, Y. (2012). Does it cost to be sustainable?. *Journal of Corporate Finance*, 18(3), 626-639.
41. Hung, M., Shi, J., & Wang, Y. (2013, September). The effect of mandatory CSR disclosure on information asymmetry: Evidence from a quasi-natural experiment in China. In Asian finance association (AsFA) 2013 conference.
42. Iatridis, G. E. (2013). Environmental disclosure quality: Evidence on environmental performance, corporate governance and value relevance. *Emerging Markets Review*, 14, 55-75.
43. Ioannou, I., & Serafeim, G. (2017). The consequences of mandatory corporate sustainability reporting. Harvard Business School research working paper, (11-100).
44. Kuzey, C., & Uyar, A. (2017). Determinants of sustainability reporting and its impact on firm value: Evidence from the emerging market of Turkey. *Journal of Cleaner Production*, 143, 27-39.
45. Lambert, R., Leuz, C., & Verrecchia, R. E. (2007). Accounting information, disclosure, and the cost of capital. *Journal of accounting research*, 45(2), 385-420.
46. Manchiraju, H., & Rajgopal, S. (2017). Does corporate social responsibility (CSR) create shareholder value? Evidence from the Indian Companies Act 2013. *Journal of Accounting Research*, 55(5), 1257-1300.
47. Milne, M. J., & Gray, R. (2013). W (h) ither ecology? The triple bottom line, the global reporting initiative, and corporate sustainability reporting. *Journal of business ethics*, 118(1), 13-29.
48. Mokhova, N., Zinecker, M., & Meluzín, T. (2018). Internal factors influencing the cost of equity capital.

49. Nguyen, P., & Nguyen, A. (2015). The effect of corporate social responsibility on firm risk. *Social Responsibility Journal*.
50. Oshika, T., & Saka, C. (2015). Created Value as Sustainability KPIs for Integrated Reporting. Available at SSRN 2547339.
51. Prado-Lorenzo, J. M., & Garcia-Sanchez, I. M. (2010). The role of the board of directors in disseminating relevant information on greenhouse gases. *Journal of business ethics*, 97(3), 391-424.
52. Reverte, C. (2012). The impact of better corporate social responsibility disclosure on the cost of equity capital. *Corporate Social Responsibility and Environmental Management*, 19(5), 253-272.
53. Schadewitz, H., & Niskala, M. (2010). Communication via responsibility reporting and its effect on firm value in Finland. *Corporate Social Responsibility and Environmental Management*, 17(2), 96-106.
54. Sierra-García, L., Zorio-Grima, A., & García-Benau, M. A. (2015). Stakeholder engagement, corporate social responsibility and integrated reporting: An exploratory study. *Corporate Social Responsibility and Environmental Management*, *22*(5), 286-304.
55. Sletten, E. (2012). The effect of stock price on discretionary disclosure. *Review of accounting studies*, 17(1), 96-133.
56. Stellner, C., Klein, C., & Zwergel, B. (2015). Corporate social responsibility and Eurozone corporate bonds: The moderating role of country sustainability. *Journal of Banking & Finance*, 59, 538-549.
57. Suto, M., & Takehara, H. (2017). CSR and cost of capital: evidence from Japan. *Social Responsibility Journal*.
58. Yeh, C. C., Lin, F., Wang, T. S., & Wu, C. M. (2020). Does corporate social responsibility affect cost of capital in China?. *Asia Pacific Management Review*, *25*(1), 1-12.
59. Zhou, S., Simnett, R., & Green, W. (2017). Does integrated reporting matter to the capital market?. *Abacus*, 53(1), 94-132

Appendixes

Appendix 1. Correlation matrix

	Cost of equity	Cost of equity growth rate	Cost of debt	WACC	Non-financial report	L1. Non-financial report	After NFR	Size	ROA	Leverage	Long term growth	Market to book ratio	Altman Z-score
Cost of equity	1.00												
Cost of equity growth rate	0.36***	1.00											
Cost of debt	-0.04*	0.08***	1.00***										
WACC	0.62***	0.31***	0.24***	1.00									
Non-financial report	-0.03***	0.06***	0.21***	-0.01***	1.00								
L1. Non-financial report	-0.03***	0.08***	0.23***	0.01	0.86***	1.00							
After_NFR	-0.02***	0.07***	0.22***	-0.01***	0.93***	0.86***	1.00						
Size	0.04***	0.04***	0.03***	-0.28***	0.43***	0.43***	0.46***	1.00					
ROA	-0.15***	-0.02***	0.04***	0.14***	0.09***	0.08***	0.08***	-0.03**	1.00				
Leverage	0.06***	0.01*	0.09***	-0.32***	0.05***	0.05***	0.04***	0.29***	-0.28***	1.00			
Long term growth	-0.09***	-0.05***	0.13***	0.01	0.03**	0.02***	0.02***	0.08***	0.32***	-0.01**	1.00		
Market to book ratio	-0.03***	0.068	-0.02***	0.22***	-0.05***	-0.05***	-0.07***	-0.25***	0.24***	-0.043	0.12***	1.00	
Altman Z-score	-0.10***	-0.01	-0.13***	0.21***	-0.11***	-0.10***	-0.13***	-0.37***	0.33***	-0.34***	0.05	0.37***	1.00

Appendix 2. Robustness check.

Proxy for COC	Proxy for NFR	Regression	Testing method	Variable/Percentage	Result
COE	NFR	Model 1	Excluding	ROA	Robust
COE	NFR	Model 1	Including	SALES GROWTH	Robust
COE	NFR	Model 1	Compression	top 1%	Robust
WACC	NFR	Model 1	Excluding	MARKET_TO_BV	Robust
WACC	NFR	Model 1	Including	SALES GROWTH	Robust
WACC	NFR	Model 1	Compression	top 5%	Robust
COD	NFR	Model 1	Including	SALES	Robust
COD	NFR	Model 1	Excluding	MARKET_TO_BV	Robust
COD	NFR	Model 1	Compression	top 5%	Robust
COE	L.NFR	Model 2	Excluding	LTG	Weak Robust
COE	L.NFR	Model 2	Excluding	Industry effects	Robust
COE	L.NFR	Model 2	Including	PPE	Not Robust
WACC	L.NFR	Model 2	Including	Rf_rate	Weak Robust
WACC	L.NFR	Model 2	Excluding	SALES GROWTH	Robust
WACC	L.NFR	Model 2	Compression	bottom 1%	Robust
COD	L.NFR	Model 2	Excluding	LN_TOT_ASSET	Robust
COD	L.NFR	Model 2	Including	SALES GROWTH	Robust
COD	L.NFR	Model 2	Including	TOBIN_Q	Weak Robust, but correlated
COE	After_NFR	Model 3	Excluding	LTG	Robust
COE	After_NFR	Model 3	Including	SALES GROWTH	Robust
COE	After_NFR	Model 3	Compression	top 5%	Robust
WACC	After_NFR	Model 3	Excluding	SALES GROWTH	Not Robust
WACC	After_NFR	Model 3	Including	TOBIN_Q	Robust
WACC	After_NFR	Model 3	Excluding	FNCL_LVRG	Robust
COD	After_NFR	Model 3	Excluding	MARKET_TO_BV	Robust
COD	After_NFR	Model 3	Including	BS_LT_BORROW	Robust
COD	After_NFR	Model 3	Compression	bottom 5%	Robust

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