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Refinancing Risk and ESG Disclosure

2nd Summer School on Sustainable Finance

Motivation

What we **know**:

Firms with higher ESG disclosure enjoy better access to finance.

What we **question**:

Do firms use ESG disclosure as a tool when they need to refinance?

What we **find**:

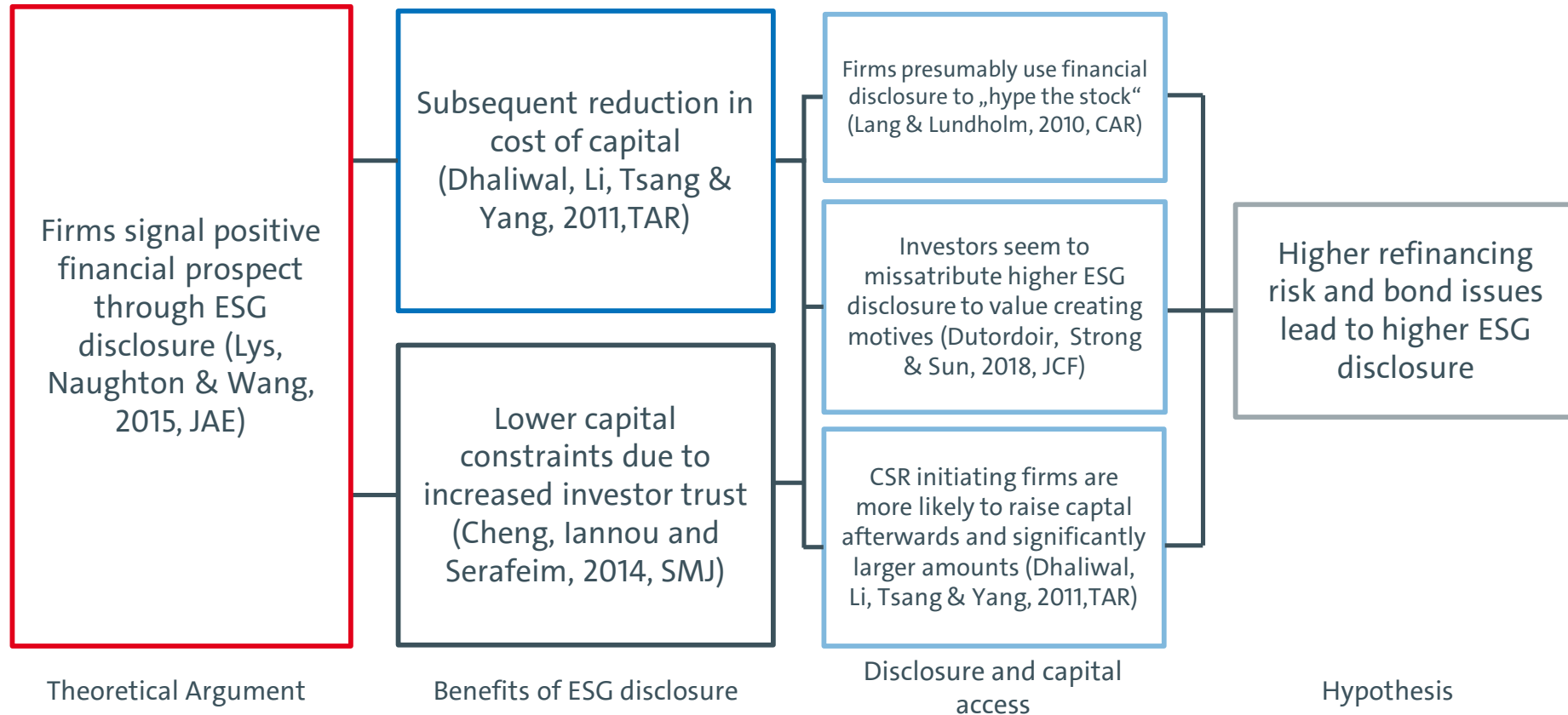
Firms increase their ESG disclosure when they aim to access capital.

What is **special** (to the best of our knowledge)?

First investigation and evidence of this the refinancing risk - ESG disclosure relationship



Literature & Hypotheses development



Dependent variable: Bloomberg ESG disclosure

- Environmental, social and governance disclosure score
- Source: Reporting, Press releases, Third-Party research

Variables:

- **ESG** (0-100) – level of ESG disclosure
- **Inc_ESG** (0/1) - whether the firm increased its disclosure in the respective year



Independent variables

- **Refinancing Risk**

Harford, Klasa, and Maxwell (2014, JoF):

- Percentage of long-term debt due in the next three years

- **Bond**

- 1 = listed a bond issue in Bloomberg / 0 = listed no bond issue in Bloomberg

- **N_Bond**

- Number of bonds issued in Bloomberg in the respective year

Control variables

▪ Capital Constrained

Kaplan and Zingales (1997, QJE), Lamont, Polk, and Saaá-Requejo (2001, RFS) and Cheng, Iannou and Serafeim (2014, SMJ):

- Level to what extent a firm is capital constrained, based on linear combination of accounting ratios

▪ Debt Level

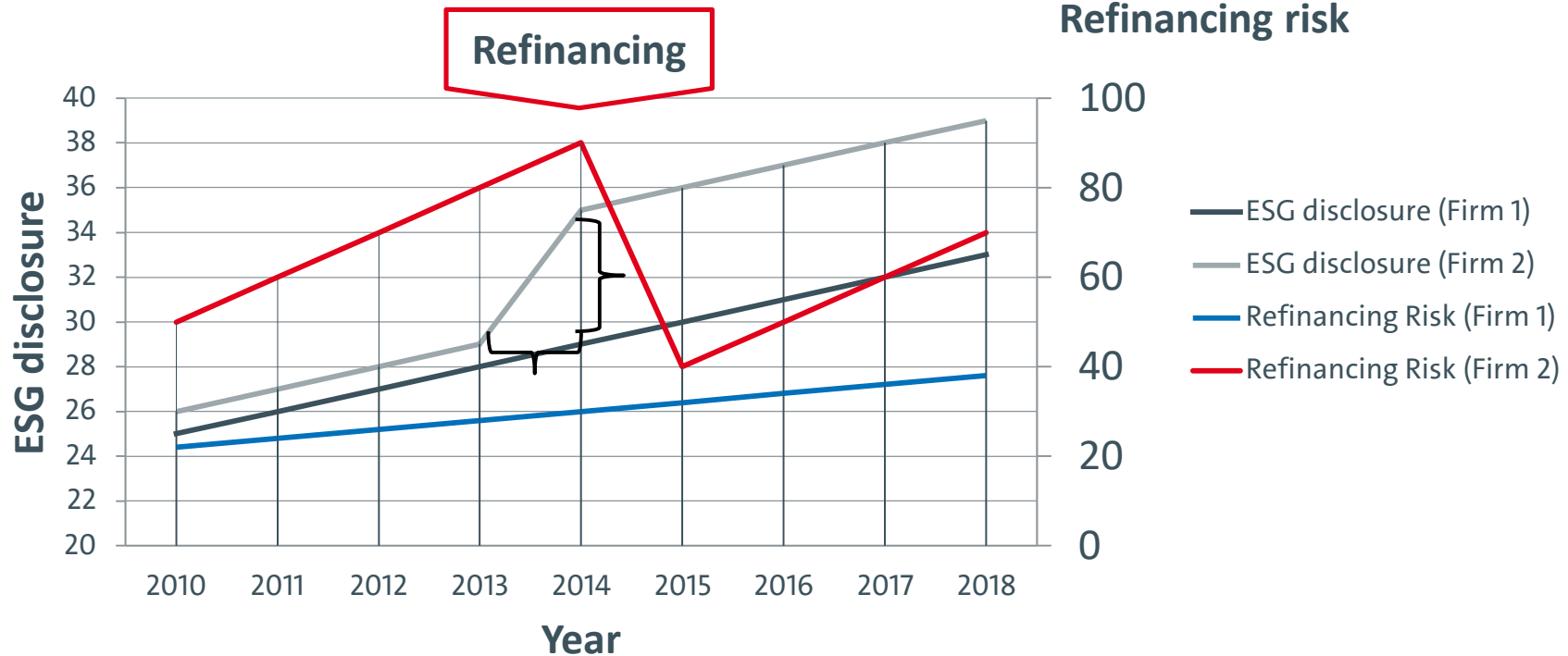
Kayhan and Titman (2004, Cambridge) and Harford, Klasa, Maxwell (2014, JoF):

- 0 = lower debt level than average, 1 = higher debt level than average

▪ Size

- Natural logarithm of total assets

ESG disclosure & refinancing risk



Research design

Model:

$$\begin{aligned} ESG_{i,t} &= \beta_1 REF_RISK_{i,t} + \beta_2 BOND_{i,t} + \beta_3 REF_RISK_{i,t} * BOND_{i,t} + \beta_4 DEBT_LEVEL_{i,t} + \beta_5 CAPITAL_CONSTR_{i,t} \\ &+ \beta_6 SIZE_{i,t} + Industry \& Year \ Fixed \ Effects + \varepsilon_{i,t} \end{aligned}$$

Alternative dependent variables:

- $ESG_{i,t-1}$
- $INC_ESG_{i,t}$

Summary Statistics

N = 12.425 Firms: 3.005 Years: 2011 – 2017

	Mean	Median	Std. Dev.	p5	p25	p75	99th Perc.	max
ESG	27.208	24.38	14.836	9.92	14.05	38.84	62.81	80.58
Inc_ESG	.544	1	.498	0	0	1	1	1
Ref Risk	.178	.149	.163	0	.062	.249	.893	1
Bond	.096	0	.294	0	0	0	1	1
N_Bond	.223	0	.861	0	0	0	6	6
CapConst	.51	.631	1.865	-2.004	-.192	1.43	5.266	6.667
DebtLevel	.654	1	.476	0	0	1	1	1
Size	22.181	22.063	1.556	19.822	21.115	23.15	26.26	27.004

Results – Base Analysis –

The influence of refinancing risk and bond issues on ESG disclosure

VARIABLES	(1) ESG	(2) ESG(t-1)	(3) Inc_ESG
Ref_Risk	2.68*** (0.66)	1.27 (0.85)	-0.04 (0.03)
Bond	-3.84*** (0.53)	-4.73*** (0.65)	-0.04** (0.02)
Bond x Ref_Risk	16.76*** (3.53)	21.64*** (4.14)	0.29** (0.13)
Cap_Const	-0.69*** (0.07)	-0.62*** (0.09)	-0.02*** (0.00)
DebtLevel	0.50** (0.25)	2.39*** (0.31)	0.20*** (0.01)
Size	5.35*** (0.08)	5.33*** (0.10)	0.03*** (0.00)
Constant	-96.23*** (2.25)	-97.98*** (2.80)	-0.47*** (0.09)
Observations	12,425	8,236	12,425
Adjusted R-squared	0.37	0.39	0.06
Year FE	YES	YES	YES
Industry FE	YES	YES	YES

Notes: The table reports the results of testing the direct interaction of Refinancing Risk and Bond Issues on ESG disclosure in the same year (1), the previous year (2), and on a dichotomized ESG disclosure variable (3). All continuous variables are winsorized at the 1 percent and 99 percent levels to mitigate the influence of outliers. The sample consists of 12,425 observations. The regressions includes industry fixed effects and year fixed effects. Standard errors are clustered by firm and year to account for heteroscedasticity. Estimated coefficients are followed by standard errors in parentheses. Significance levels at 10 percent, 5 percent, and 1 percent, one-tailed, are indicated by *, **, and ***, respectively.

Additional analysis – Interaction of refinancing risk and the number of bonds issued per year

VARIABLES	(1) ESG	(2) ESG(t-1)	(3) Inc_ESG
Ref_Risk	3.14*** (0.66)	3.21*** (0.82)	-0.04 (0.03)
N_Bond	-0.90*** (0.20)	-0.77*** (0.25)	-0.02** (0.01)
Ref_Risk x N_Bond	5.27*** (1.32)	5.02*** (1.52)	0.09* (0.05)
Cap_Const	-0.70*** (0.07)	-0.67*** (0.08)	-0.02*** (0.00)
DebtLevel	0.55** (0.25)	-0.24 (0.31)	0.20*** (0.01)
Size	5.32*** (0.08)	5.53*** (0.10)	0.03*** (0.00)
Constant	-95.63*** (2.26)	-99.51*** (2.75)	-0.48*** (0.09)
Observations	12,425	8,236	12,425
Adjusted R-squared	0.37	0.39	0.06
Year FE	YES	YES	YES
Industry FE	YES	YES	YES

Notes: The table reports the results of testing the direct interaction of Refinancing Risk and the number of Bonds Issued per year on ESG disclosure in the same year (1), the previous year (2), and on a dichotomized ESG disclosure variable (3). All continuous variables are winsorized at the 1 percent and 99 percent levels to mitigate the influence of outliers. The sample consists of 12,425 observations. The regressions includes industry fixed effects and year fixed effects. Standard errors are clustered by firm and year to account for heteroscedasticity. Estimated coefficients are followed by standard errors in parentheses. Significance levels at 10 percent, 5 percent, and 1 percent, one-tailed, are indicated by *, **, and ***, respectively

Additional Analysis - Analysis of sample with only firms who issue a bond in Bloomberg

VARIABLES	(1) ESG	(2) ESG (t-1)	(3) Inc_ESG
Ref_Risk	4.30** (1.75)	3.58 (2.48)	-0.02 (0.08)
Bond	0.32 (0.62)	-0.46 (0.81)	-0.05** (0.03)
Bond x Ref_Risk	12.37*** (3.74)	14.29*** (4.93)	0.29* (0.15)
Cap_Const	-0.45*** (0.10)	-0.37*** (0.14)	-0.01** (0.00)
DebtLevel	-0.17 (0.51)	0.99 (0.79)	0.30*** (0.02)
Size	5.79*** (0.18)	5.71*** (0.24)	0.03*** (0.01)
Constant	-105.13*** (4.60)	-105.21*** (5.77)	-0.46** (0.21)
Observations	2,603	1,525	2,603
Adjusted R-squared	0.49	0.49	0.12
Year FE	YES	YES	YES
Industry FE	YES	YES	YES

Notes: The table reports the results of testing the direct interaction of Refinancing Risk and Bond Issues on ESG disclosure in the same year (1), the previous year (2), and on a dichotomized ESG disclosure variable (3). All continuous variables are winsorized at the 1 percent and 99 percent levels to mitigate the influence of outliers. The sample consists of 2,604 observations. The regressions includes industry fixed effects and year fixed effects. Standard errors are clustered by firm and year to account for heteroscedasticity. Estimated coefficients are followed by standard errors in parentheses. Significance levels at 10 percent, 5 percent, and 1 percent, one-tailed, are indicated by *, **, and ***, respectively

Robustness Tests – propensity score matching and entropy balancing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Base ESG	PSM ESG	EB ESG	Base ESG(t-1)	PSM ESG(t-1)	EB ESG(t-1)	Base Inc_ESG	PSM Inc_ESG	EB ESG(t-1)
Ref_Risk	2.68*** (0.66)			1.27 (0.85)			-0.04 (0.03)		
Bond	-3.84*** (0.53)	-2.25*** (0.56)	-2.60*** (0.51)	-4.73*** (0.65)		-2.40*** (0.65)	-0.04** (0.02)	-0.01 (0.02)	-0.02 (0.02)
Bond x Ref_Risk	16.76*** (3.53)			21.64*** (4.14)	0.49* (0.28)		0.29** (0.13)		
RR		-2.25*** (0.56)	0.96*** (0.23)		0.49* (0.28)	0.50* (0.28)		0.00 (0.01)	0.00 (0.01)
RR x Bond		1.70** (0.84)	3.19*** (1.00)		2.80*** (1.04)	3.34** (1.30)		-0.01 (0.03)	0.08** (0.04)
Cap_Const	-0.69*** (0.07)	-0.67*** (0.07)	-0.63*** (0.07)	-0.62*** (0.09)	-0.62*** (0.09)	-0.60*** (0.09)	-0.02*** (0.00)	-0.02*** (0.00)	-0.01*** (0.00)
DebtLevel	0.50** (0.25)	0.41 (0.25)	1.99*** (0.27)	2.39*** (0.31)	2.26*** (0.32)	2.71*** (0.32)	0.20*** (0.01)	0.20*** (0.01)	0.08*** (0.01)
Size	5.35*** (0.08)	5.31*** (0.08)	5.11*** (0.08)	5.33*** (0.10)	5.28*** (0.10)	5.10*** (0.11)	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)
Constant	-96.23*** (2.25)	-95.30*** (2.30)	-90.17*** (2.39)	-97.98*** (2.80)	-96.78*** (2.85)	-91.64*** (3.02)	-0.47*** (0.09)	-0.48*** (0.09)	-0.39*** (0.10)
Observations	12,425	11,690	12,425	8,236	7,828	8,236	12,425	11,690	12,425
Adjusted R-squared	0.37	0.37	0.36	0.38	0.37	0.36	0.05	0.05	0.15
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: The table reports the results of testing the direct interaction of Refinancing Risk and Bond Issues on ESG disclosure in the same year, the previous year, and on a dichotomized ESG disclosure variable for the main analysis, the Proprietary Score Matched Sample as well as the Entropy Balanced Sample. All continuous variables are winsorized at the 1 percent and 99 percent levels to mitigate the influence of outliers. The sample consists of 12,425 observations. The regressions includes industry fixed effects and year fixed effects. Standard errors are clustered by firm and year to account for heteroscedasticity. Estimated coefficients are followed by standard errors in parentheses. Significance levels at 10 percent, 5 percent, and 1 percent, one-tailed, are indicated by *, **, and ***, respectively

Additional Analysis – Environmental, Social and Governance Disclosure

VARIABLES	(1) ENV	(2) ENV(t-1)	(3) Inc_ENV	(4) SOC	(5) SOC(t-1)	(6) Inc_SOC	(7) GOV	(8) GOV(t-1)	(9) Inc_GOV
Ref_Risk	4.95*** (0.87)	5.07*** (1.09)	-0.05* (0.03)	2.44*** (0.86)	2.44** (1.06)	-0.05* (0.03)	-0.43 (1.35)	-0.83 (1.65)	0.00 (0.02)
Bond	-5.95*** (0.67)	-5.72*** (0.90)	0.05** (0.02)	-4.95*** (0.68)	-4.90*** (0.93)	0.00 (0.02)	1.05 (1.12)	-2.97** (1.40)	-0.02 (0.01)
Bond x Ref_Risk	20.39*** (4.52)	18.59*** (5.90)	0.08 (0.12)	17.57*** (4.48)	21.00*** (6.34)	-0.00 (0.14)	-5.36 (6.60)	4.50 (9.16)	0.06 (0.07)
Cap_Const	-0.73*** (0.08)	-0.67*** (0.10)	0.00 (0.00)	-1.06*** (0.09)	-1.00*** (0.11)	0.01** (0.00)	-0.61*** (0.12)	-0.57*** (0.14)	0.00** (0.00)
DebtLevel	2.81*** (0.31)	1.87*** (0.39)	0.08*** (0.01)	-2.29*** (0.33)	-3.93*** (0.41)	0.14*** (0.01)	9.20*** (0.50)	9.22*** (0.59)	-0.01** (0.01)
Size	6.37*** (0.10)	6.70*** (0.12)	-0.05*** (0.00)	5.93*** (0.10)	6.01*** (0.13)	-0.05*** (0.00)	1.06*** (0.17)	0.64*** (0.20)	-0.00 (0.00)
Constant	-132.11*** (2.77)	-138.92*** (3.39)	1.68*** (0.09)	-106.16*** (3.10)	-105.48*** (3.79)	1.43*** (0.09)	-15.76*** (4.64)	-11.25** (5.53)	0.95*** (0.05)
Observations	12,425	8,236	12,425	12,425	8,236	12,425	12,425	8,236	12,425
R-squared	0.37	0.38	0.05	0.30	0.31	0.04	0.04	0.04	0.01
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: The table reports the results of testing the direct interaction of Refinancing Risk and Bond Issues on ESG disclosure in the same year (1), the previous year (2), and on a dichotomized ESG disclosure variable (3). All continuous variables are winsorized at the 1 percent and 99 percent levels to mitigate the influence of outliers. The sample consists of 12,425 observations. The regressions include industry fixed effects and year fixed effects. Standard errors are clustered by firm and year to account for heteroscedasticity. Estimated coefficients are followed by standard errors in parentheses. Significance levels at 10 percent, 5 percent, and 1 percent, one-tailed, are indicated by *, **, and ***, respectively.

Contribution

1. Firms might use the signal of CSR disclosure as suggested in Lys, Naughton & Wang (2015, JAE)
2. Firms seem to be aware of capital market benefits of ESG disclosure as found in Dhaliwal, Li, Tsang & Yang (2018, TAR); Choi & Wang (2009, SMJ); Cheng, Iannou and Serafeim (2014, SMJ)
3. We provide further evidence of strategic use of disclosure (Lang & Lundholm, 2010, CAR; Dutordoir, Strong & Sun, 2018, JCF; Dhaliwal, Li, Tsang & Yang, 2011, TAR)

Conclusion

1. Firms increase their ESG disclosure when they need to refinance and issue a bond in the respective year
2. Firms mainly increase their environmental and social disclosure, instead of governance disclosure.
3. Firms might use ESG disclosure as a tool to access capital

Thank you very much for your attention!

Backup

Control Variables Calculation

- **Capital Constrained**

Kaplan and Zingales (1997), Lamont, Polk, and Saaá-Requejo (2001) and Cheng, Iannou and Serafeim (2014):

- linear combination of five accounting ratios: (1) cash flow to total capital; (2) the market to book ratio; (3) debt to total capital; (4) dividends to total capital; and (5) cash holdings to capital

- **Debt Level** by Kayhan and Titman (2004)

- model to predict firms' debt level based on the following lagged variables: (1) market-to-book assets; (2) property, plant, and equipment/book assets; (3) research and development expenses/sales; (4) a dummy variable for whether a firm reports no research and development expenses; (5) selling expenses/sales, (6) the natural logarithm of sales; and Fama-French 48 industry and year dummy variables. We use the fitted values from this model and follow Harford et al. (2014) and
- 0 = lower debt level than average, 1 = higher debt level than average

- **Size** (natural log. of total assets)