IAEE 2023

The effects of mandatory ESG disclosure regulation on company and investor behaviour: an experimental approach

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Agenda

1	**Research motivation & relevance**
2	Literature overview & research hypotheses
3	Methodology & experimental approach
4	Presentation of results
5	Contribution and Q&A

CSRD introduction as response to little effectiveness of NFRD resulting in significant increase of bureaucratic overhead

Non-Financial Reporting Directive 2017

- **Release:** 2014, effective in EU member states as of 2017
- **Company scope:**
  - Employees: >500
  - Net turnover: EUR >40 Mio. OR Balance sheet: >20 Mio.
  - ~ 11,700 companies in EU
- **Goal:** Provide for higher level of comparability among companies' non-financial matters
- **Perception:** One of the most impactful directives the European Union has enacted to achieve climate targets

Corporate Sustainability Reporting Directive 2024

- **Release:** April 2021, effective earliest by FY 2024
- **Company scope:**
  - Employees: >250
  - Net turnover: EUR >40 Mio. OR Balance sheet: >20 Mio.
  - ~ 50,000 companies in EU
- **Reasoning**: NFRD with no significant improvements in reporting quality, thus extend company and reporting content scope

Main differences: NFRD vs. CSRD

1. Report according to double materiality principle which will be legally binding
2. Report on strategy as well as future targets, both qualitatively and quantitively, and disclose information regarding intangibles
3. Report as part of annual management report in an electronic format – no separate reports allowed
4. External audit of reported information is required

Source: European Parliament (2014, 2019, 2021); Global Reporting Initiative (2017); Cosma et al. (2021)

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Inspired by previous paper, question arises whether increasing regulatory pressure and thus overhead to comply with requirements is the right way to go

- Upcoming **regulatory changes only exert limited pressure** on German family-owned companies while **pressure from within the market**, i.e., customers & competitors, as well as **intrinsic motivation** are main drivers for carbon accounting

- Reflections from interviews show **doubts about regulatory introduction** and its associated overhead:
  - *“Now, of course, the auditors produce a lot of blah blah about CSRD and ESG.”*
  - *“Honestly, I don't like auditors who don't know anything about circularity.”*
  - *„I understand that they like the CSRD quite a lot because it’s effectively doubling their turnover."*
  - *“This is bureaucracy!”*
  - *“In the end, I actually need service providers to help me capture the data in the supply chain. That's something an auditor can't help me with.”*

Source: Case study analysis

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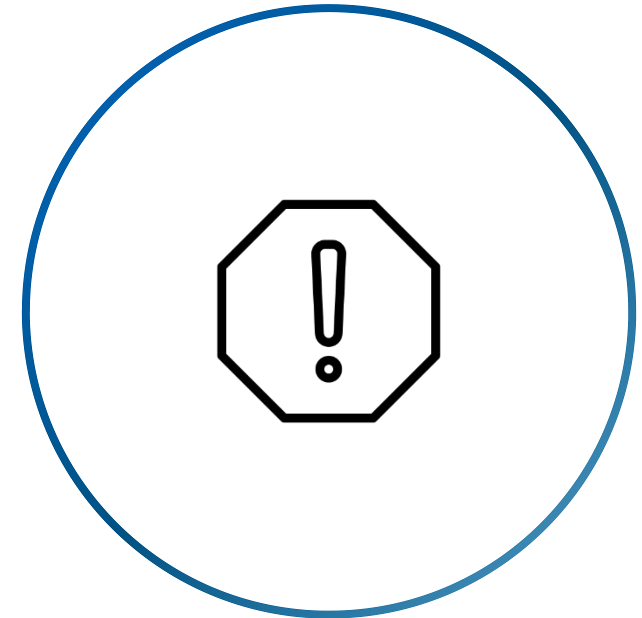
Voluntary

Disclosure

Mandatory



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Voluntary disclosure has been found as yielding higher company valuations due to lower cost of equity resulting from lower risk and more predictability

Higher market valuations and appeal to investors

- **Higher valuations:** Companies adhering to agreed upon global standard have higher market valuations measured by Tobin's Q, i.e., company's market value divided by reproduction costs of tangible assets (Dowell et al. 2000)
- **Lower cost of equity:** Dhaliwal et al. (2011) find positive correlation between ESG disclosure and company value driven by lowered cost of equity through ESG information (Plumlee et al. 2015)
- **Better predictability:** Disclosing ESG-related information results in better predictability of future cash flows as well as profitability (Clarkson et al. 2013)
- **Increased likelihood of receiving investments:** Companies issuing ESG reports receive special attention by market analysts and show increased likelihood of receiving investments (Dhaliwal et al. 2011)

Separate effects of E and S disclosure

- **Social disclosure value-add:** Disclosure of social aspects is adding company value while environmental disclosure is not creating company value due to high amount of public scrutiny and even litigation risks when disclosing environmental information (Verbeeten et al. 2016)
- **Environmental disclosure value-add:** De Villiers et al. (2021) find investors have willingness to pay for environmental disclosure, yet not for disclosure on social aspects
- **Reports in sensitive industries:** Companies operating in industries known for higher environmental sensitivity issue more voluntary environmental reports of, on average, higher quality (Marshall et al. 2009)

Voluntary

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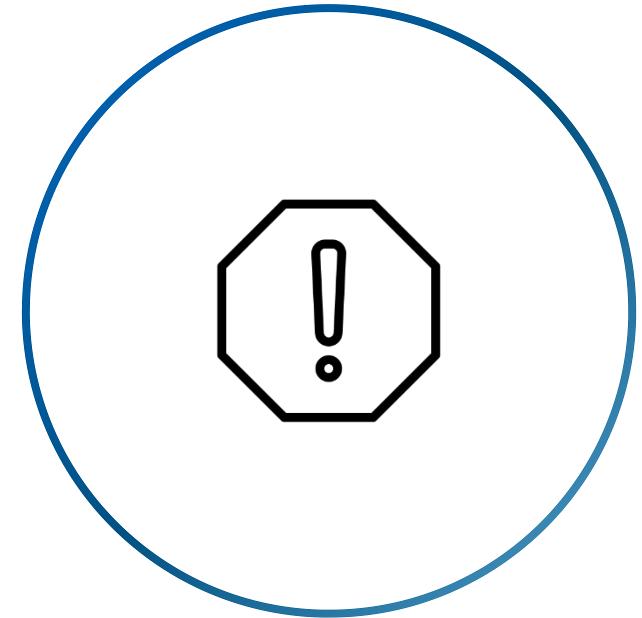

Does mandatory reporting make sense? Advantages and disadvantages of introducing a mandatory reporting regime

Advantages of mandatory reporting regime

- **Positive externalities:** Disclosed information benefits companies which do not compete with company disclosing mandatorily (Leuz & Wysocki 2008)
- **Innovation:** Porter and van der Linde (1995) find regulatory measures fostering innovation exceeding cost of compliance; Chakraborty & Chatterjee (2017) reveal increasing expenditures on R&D of 11% – 61% caused by foreign regulations
- **Cost savings in market:** Standardization of reporting formats, i.e., processing of information is a lot easier and less time consuming for stakeholders when same standard is applied by all companies
- **Unsatisfactory sanctions in private market:** Sanctions limited to monetary punishments in private contracts whereas governmental regulator can further impose criminal penalties beyond financial punishment

Disadvantages of mandatory reporting regime

- **Costs for regulators:** Developing and designing mandatory reporting structure is costly for regulator and furthermore requires resources to enforce compliance with defined rules (Leuz & Wysocki 2008); costs for complying with environmental regulations in the U.S. exceeded USD 125 billion (Jaffe et al. 1995), expected today beyond USD 200 billion (~1% of GDP)
- **Costs for companies:** Regulation increases efforts among companies with previously high and low disclosure as it is harder to differentiate themselves or meet minimum standard (Ioannou and Serafeim 2017)
- **Risks for companies:** Disclosing more information results in higher degree of public scrutiny, time-consuming requests from society members and even litigations from private people or organizations (Arora & Cason 1995; Christensen et al. 2021)

Literature with tendency towards positive impact of mandatory reporting on disclosed amount, yet differing views exist requiring further investigation

Impact of mandatory reporting on companies

- Mandatory reporting regulation resulting in "**race to the top**" (Ioannou and Serafeim 2017) with overall positive effect
- Verrecchia (2001) finds **motivation among companies to increase disclosed amount** of information once a regulation has been issued
- Cordazzo et al. (2020) **do not find companies to disclose more ESG-related information** once an ESG-regulation has come to power and much rather identify companies to shift towards a pragmatic legitimacy (Suchman 1995)

Company-related hypotheses

H1: The amount of information companies disclose increases after introducing a regulatory minimum for disclosing ESG-related information

H2: The amount of information companies disclose will converge towards the regulator's minimum level

Investors value additional information as it decreases uncertainty and thus their risk resulting in an expectation of higher investments post-regulation

Impact of mandatory reporting on investors

- Investors find **ESG information value-enhancing** as it increases transparency and thus reduces risks. Yet, the **incremental added value** of higher ESG information disclosure **does not seem constant** (e.g., Clarkson et al. 2013; Reverte 2016)
- De Villiers et al. (2021) find that investors **value information beyond the minimum level**, yet only until the average level of disclosed information and not beyond this point
- Investors are **accepting lower returns** when more information is disclosed as their **investment failure risk decreases** (De Villiers et al. 2021)

Investor-related hypotheses

H3: The amount of capital the investors invest increases after introducing a regulatory minimum for disclosing ESG-related information

H4: Investors will invest in companies with higher disclosure pre-regulation and companies with lower disclosure post regulation

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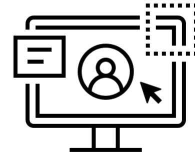
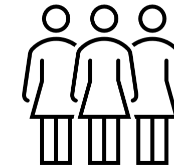
Experiments were conducted among 207 subjects over a course of 3 weeks



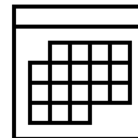
Software:
Z-Tree

Location:
Experimental laboratory at Technical University Munich (experimenTUM)

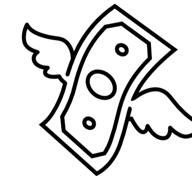
Treatments:
1 control group (C0) where ($\underline{x}$ = 0) + 3 treatment groups (T3, T5, T7) where ($\underline{x}$ = 3, 5, 7)



Subjects:
207 students from both Munich universities as future investors and decision makers



Schedule:
April 13 – May 5, 2023



Compensation:
~ EUR 12.42 / subject

Experiment set up as one-shot game where two agents disclose ESG information to achieve an investment from the principal

Experimental approach

- One-shot game where **two companies disclose** an amount of x and **one investor invests** in one of the companies an amount of y
- One control group where $\boldsymbol{x}$ **is chosen freely** and **three treatment groups** where $\underline{x}$ is set exogenously to a low, medium or high regulatory level

Agent / Company perspective

- Two companies **compete against each other** for an investment
- Each company decides to disclose an amount $\boldsymbol{x}$ ***where*** $\boldsymbol{x \in \{\underline{x}, \ldots, 10\}}$
- The cost of disclosure increase exponentially, i.e., $\boldsymbol{c(x) = x^2}$
- As a company cannot be sure how the other company reacts its better to **disclose the minimum** $\underline{\boldsymbol{x}}$ when company is risk-neutral

Principal / Investor perspective

- Investor decides to **invest an amount of** $\boldsymbol{y}$ into one of the companies where $y \in \{0, 1, \ldots, 110\}$
- The higher the disclosure amount invested in, the higher the success probability, yet also the lower the return
- In any case it is worthwhile for an investor to **invest the entire capital**

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Disclosure amounts increase constantly with higher regulatory treatments, yet only significant increase for T5 and T7 compared to C0

Table 1 – Company disclosure behaviour by regulatory treatment

		C0	T3	T5	T7
Disclosed amount [IDUs]	Average	4.64	5.50	6.44	7.56
	Median	5.00	5.50	6.00	7.00
Wilcoxon rank-sum test results	C0	-	0.1583	0.0000***	0.0000***
	T3	-	-	0.0099**	0.0000***
	T5	-	-	-	0.0000***

- Linear increase of **one additional IDU** per treatment
- **H1 confirmed only partly** for T5 and T7 treatments, yet not for T3, i.e., more regulation also leads partly to more disclosure
- Already in **no-regulation case, almost half** the possible disclosure amount is disclosed

Note - number of subjects representing companies: 36 (C0), 34 (T3, T5, T7)

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Disclosure amounts slowly converge towards regulatory minimum, yet only significant for highest regulatory treatment

Table 2 – Convergence of company disclosure against the regulatory minimum

		C0	T3	T5	T7
Disclosed amount [IDUs]	Average	4.64	2.50	1.44	0.56
	Median	5.00	2.50	1.00	0.00
Share of subjects choosing reg. minimum		11%	15%	24%	59%
Shapiro-Wilk test result p-values		0.1566	0.3881	0.1089	0.0003***

- **Rejection** of null hypothesis **only for T7**, as disclosure amounts are **not normally distributed** at the 0.1% significance level
- Disclosure costs rise **significantly between disclosure levels seven, eight and nine**, thus added value of disclosure vis-à-vis the incremental cost seems to motivate subjects to stick with the regulatory minimum instead

Note - number of subjects representing companies: 36 (C0), 34 (T3, T5, T7)

Investors are motivated to invest significantly more capital in all regulatory treatments irrespective of the exact magnitude

Table 3 – Investor behaviour by regulatory treatment

		C0	T3	T5	T7
Disclosed amount [IDUs]	Average	38.56	67.29	68.82	72.06
	Median	30.00	60.00	65.00	70.00
Wilcoxon rank-sum test results	C0	-	0.0057**	0.0048**	0.0023**
	T3	-	-	0.8578	0.3948
	T5	-	-	-	0.6506

- Investment distribution of no-regulation case differs significantly from all regulatory treatments, thus **confirming H3**
- Difference appears to result from the regulation's existence, **irrespective of its magnitude**
- Whether regulatory minimum is at a higher or a lower level appears **not to impact investor** behaviour any further

Note - number of subjects representing investors: 18 (C0), 17 (T3, T5, T7)

While more investors invest in company with lower disclosure in higher regulatory treatment, majority prefers higher disclosure at all levels

Table 4 – Investor's investment decision by regulatory treatment and disclosure amount

		C0	T3	T5	T7
Relative share of investment decisions based on company disclosure	Higher disclosure	61.1%	70.6%	64.7%	41.2%
	Lower disclosure	5.6%	17.6%	35.3%	23.5%
	Equal disclosure	33.3%	11.8%	0.0%	35.3%

- Rejection of H4 as most investors in all treatments **invest in the higher disclosing company**
- We find support for this in **general risk aversion of investors** beyond expected levels
- Aligns with our assumption that **investors prefer a higher information disclosure** over a lower

Note - number of subjects representing investors: 18 (C0), 17 (T3, T5, T7)

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Highest profits across companies and investors achieved in the low and medium regulatory scenarios showing benefits of moderate regulation

Table 5 – Combined profits across companies and investors by regulatory treatment

		C0	**T3**	**T5**	**T7**
Disclosed amount [IDUs]	Average	339.77	383.98	370.46	357.60
	Median	317.48	390.45	398.24	361.71
Wilcoxon rank-sum test results	C0	-	0.1458	0.3304	0.3305
	T3	-	-	0.7789	0.2415
	T5	-	-	-	0.4691

- Although insignificant, a **moderate regulation makes sense vis-à-vis a no-regulation** scenario (T3, T5)
- Differences between the no-regulation case and the low-regulation treatments are **closest to statistical significance**, with a p-value < 0.15

Note - number of combined observations considered: 18 (C0), 17 (T3, T5, T7)

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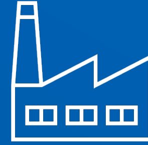
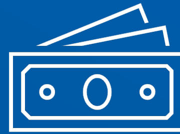
The paper contributes to the existing literature on voluntary and mandatory ESG-related reporting



Companies:
Provides guidance to companies on **how other companies react under uncertain** circumstances and furthermore sheds light on **risk propensity of investors** and thus the **right level of disclosure**



Investors:
Highlights **risk propensity of investors** and sheds light on the maximum level of risk **investors are generally willing to take** related to ESG disclosure

Regulators:
Potentially **stresses important contribution of regulators** to higher ESG-related information disclosure which may even result in **higher amounts of capital invested** and furthermore provides **guidance on the right level of ESG disclosure**

Discussion and Q&A

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