

Are Green IPOs different? Evidence from the Nordic Stock Exchanges

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Overview

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Research issue

Background

Stock markets key to financing the circular economy

- Financing large green investments (e.g. Renewable energy generation).
- Financing green innovations – IPO and subsequent SEO's finance the scaling up of startups – particularly green innovations.

Therefore – **Research agenda** – are environmental properties of a company important for firm financing?

- Is there an additional “green glow”?
→ investors demand less return for green projects (subsidized financing)
- Reluctance to finance “brown” projects (exclusions)?
→ brown projects have to offer higher returns?

Research issue

Empirical Investigations of ESG effects

Typical research: Asset pricing – are “green” / ESG firm properties *priced*?
(are firm's cost of capital affected?)

→ Crosssectional investigations of stock returns.
(i.e. pricing on secondary markets)

This paper: Why not look at primary markets — IPOs — instead?

- Any ESG effects should also be present in IPOs
(it is the same cost of capital, after all)
- Arguably more important, since it is about *new capital* flowing into green investments.

Research issue

This paper: IPOs in Nordic Equity Markets – are there any links to green/environmental issues?

Why Nordics?

- Homogeneous set of countries
 - “S” and “G” parts of ESG will have little variation.
- Political agreement on need to act on climate.

Key findings

- Underpricing (first day return) lower for “green” companies. (Actually looks like overpricing).
- IPO price is higher for firms concerned about climate issues (based on ratio valuation).
 - So far only using data for Norway on this. (rest coming).
- Magnitudes: Small

Literature – ESG and stock returns

Modelling differences in cost of capital due to ESG

- The pecuniary view.
 - Stock prices do not fully reflect future ESG consequences (e.g. climate).
 - Short-termism (Stein, 1989)→ Green stocks higher long term return
- The non-pecuniary view (ESG in utility function)
 - Equilibrium models – tradeoff ESG/Cost of Capital
 - Pástor, Stambaugh, and Taylor (2021) Pedersen, Fitzgibbons, and Pomorski (2021)→ Green stocks can sustain lower return

Literature - ESG and stock returns

Estimates of a Green Return Premium

- Evidence support non-pecuniary view (Green Return Premium < 0)

Examples (estimated return difference)

- Sin (Hong and Kacperczyk, 2009) (-3.5%)
- Environment (Chava, 2014) (-0.7% to -1.4%)
- Carbon (Bolton and Kacperczyk, 2021) (-1.5% to -3.6%).
- Green vs Brown (Pástor, Stambaugh, and Taylor, 2022) (-1.4%)
- Exclusions from The Oil Fund (Berle, He, and Ødegaard, 2025) (-5%)

Literature – Initial Public Offers

Empirically: Large underpricing – Money “left on the table”

- Classical IPO literature
 - explaining underpricing in bookbuilding
 - Informational issues

Newer issues in IPOs

- “The decline of the listed corporation”

Reactions:

- Intermediaries: Fiddling with form of IPO
 - Auction IPOs
 - Direct Listings
 - SPACs
- Exchanges: Create menu of market places, differing on
 - Direct cost of being listed
 - Listing requirements
 - Regulation

Hypothesis development – Informational differences

Hypotheses developed adapting typical IPO theories

Informational differences between parties in IPO:

- Investment bank – set price
- Buyers of stocks at IPO stage.

Theories

- *Partial adjustment* theory: Investors better informed about their valuations (ESG preferences). To elicit true revelation (during bookbuilding) from investors, issue price lower than true price.
- *Neglected demand* theory: ESG aspects of cost of capital ignored by investment bank in price setting.

Implication: If cost of capital lower for “green” firms

→ Underpricing increasing in sustainability.

Hypothesis 1: Measures of underpricing (first day returns) increases with the firm’s environmental quality.

Hypothesis development – Symmetric information

Alternative theoretical framing: The link between ESG and cost of capital is understood by all (no asymmetrical information).

→ IPO *issue price* reflect the ESG properties of the firm and demand of institutional investors.

Supplementary observation: Numerous institutional investors have preferences for green investment

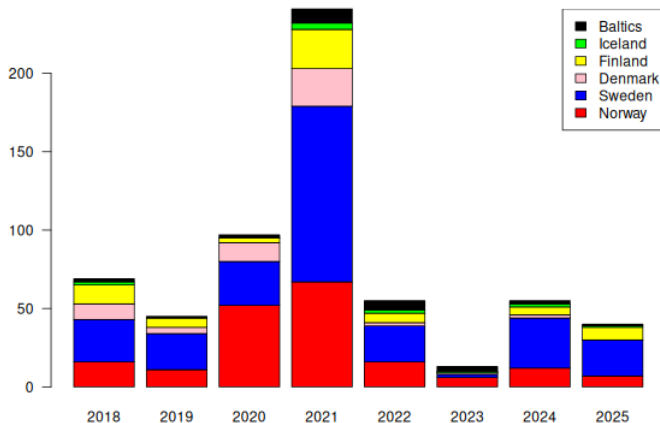
- “Green” funds, PRI declarations, exclusions, etc.

Higher demand in bookbuilding process for companies with “green” credentials → Rationing → Higher price

Hypothesis 2: “Green” companies will have higher IPO prices (lower underpricing).

Data – IPOs by country. 2018-2025.

Number of IPOs per country



Data - ESG measurement - How to?

ESG - Environmental Social Governance

Of particular concern for this paper: E

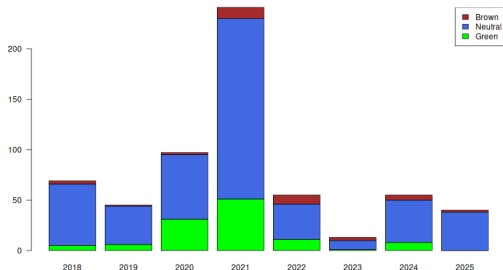
- Environment
- Sustainability
- Climate

Data – ESG measurement –

Proxy 1 – Manually categorizing business plan

Manually group firms into 3 types

- ① **Green.** Renewable energy. Sustainability innovation. Circular Economy.
- ② **Neutral.** Financials, Pharma, IT, etc.
- ③ **Brown.** Oil and Gas related.



Data – ESG measurement –

Proxy 2 - Firms' emphasis in prospectus

Text analysis

- Nonstandard part of prospectus (business plan)
- Among the IPOs in sample, relative occurrence of terms:
 - Positive towards environment. ESG(environment).
 - Negative towards environment. ESG(brown)

→ Idea: Measure how central these issues are to business plan of firm.

Note

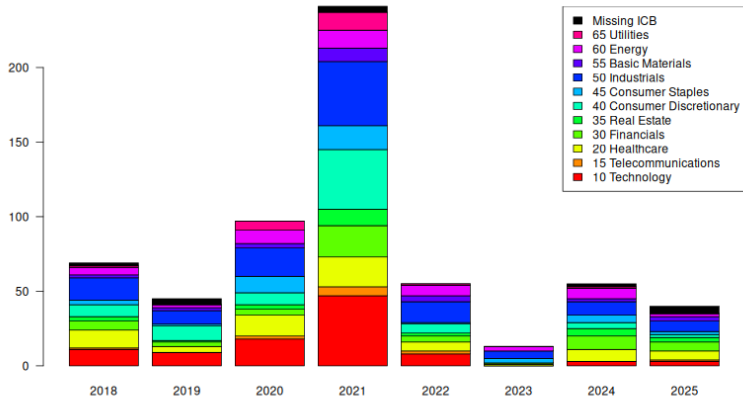
- Ranking is relative to the corpus of IPOs.
- Does not imply ranking by “Greenness”

Data – ESG measurement – Proxy 3 – Self-reported emissions

Reporting (accounts) requirements widen

- *Scope 1* – Direct greenhouse (GHG) emissions from firm. Normalized by Enterprise Value (EV).
- *Total GHG Emissions* – Sum of the firms Scope 1, 2 and 3 emissions. also normalized by EV.
- Fossil fuel sector – dummy variable

Data: Industry Classification of listing companies



Number of IPOs by industry, proxied by ICB classification.

Results – IPO Underpricing

To estimate

$$\text{Underpricing}_i = \alpha + \mathbf{b}^{ESG} \text{ESG measures}_i + \mathbf{b}^2 \text{Controls}_i + \varepsilon_i,$$

Underpricing:

Open price vs Closing price (efficient price)

Controls

- Firm size
- Industries
- Exchange

Results – IPO Underpricing

$$\text{Underpricing}_i = \alpha + \mathbf{b}^{ESG} \text{ESG measures}_i + \mathbf{b}^2 \text{Controls}_i + \varepsilon_i,$$

ESG measure: Manual categorization: Green/Neutral/Brown

	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	-22.2** (10.4)	-2.2 (3.5)	-0.9 (1.7)	0.5 (1.6)	-0.2 (2.1)	-1.7 (3.8)
Green	-2.1 (2.1)	-3.5 (2.1)	-1.9 (2.0)	-2.3 (2.2)	-2.5 (2.2)	-3.8* (2.3)
ln(MktCap)	1.2** (0.6)					
PreWar			0.6 (1.9)		1.1 (2.1)	0.0 (2.1)
Country fixed effects		X				X
Industry fixed effects				X	X	X
Adj. R ²	0.0	0.0	-0.0	-0.0	-0.0	0.0
Num. obs.	430	454	454	446	446	446

*** $p < 0.025$; ** $p < 0.05$; * $p < 0.1$

Results – IPO underpricing

Results indicate IPO (open) price higher for green group.

Consistent with Hypothesis 2, symmetric info and rationing of institutional investors in IPO.

Inconsistent with Hypothesis 1, asymmetric info and higher underpricing for green companies.

Dig into: **Mean returns by country and greenness**

	Green	Neutral	Brown
Norway	-2.0	3.3	-1.1
Sweden	-2.6	-3.0	5.5
Finland	-7.3	-1.5	
Denmark	2.7	7.8	
Iceland		-0.6	
Baltics	-3.8	-3.6	-0.9
All	-2.2	-0.4	-0.7

Results - IPO price inferred cost of capital

Alternative way of asking whether IPO price higher for green companies.
From finance 101

$$P_i = \frac{EPS_i}{r_i}$$

→ Estimate *implied cost of capital*

$$\hat{r}_i = \frac{EPS_i}{P_i}$$

Asking whether ESG matters

$$EPS_i/P_i = \alpha + \beta^{ESG} \mathbf{ESG\ measures}_i + \beta^2 \mathbf{Controls}_i + \varepsilon_i$$

Results - IPO price inferred cost of capital (Norway Only)

$$EPS_i/P_i = \alpha + \beta^{ESG} \mathbf{ESG\ measures}_i + \beta^2 \mathbf{Controls}_i + \varepsilon_i$$

ESG measure: ESG inferred from prospectus

	(4)	(5)	(6)
(Intercept)	-26.161 (13.332)	-24.673 (13.226)	-21.801 (21.446)
ln(ESG Environment)	-2.621 (0.358)***	-2.346 (0.215)***	
ln(ESG Brown)	0.245 (0.255)		-1.243 (0.247)**
ln(MktCap)	1.038 (0.598)	0.972 (0.594)	0.965 (0.963)
Merkur	-1.973 (1.596)	-1.694 (1.568)	2.029 (2.415)
ICB-10 (Tech)	-0.876 (2.044)	-1.550 (1.917)	-5.882 (3.101)
ICB-45 (Cons Stapl)	5.317 (2.223)**	4.676 (2.117)*	-2.577 (3.129)
ICB-50 (Indus)	1.530 (1.565)	1.470 (1.562)	-1.173 (2.449)
ICB-60 (Energy)	1.098 (1.768)	1.351 (1.746)	0.080 (2.838)
Adj. R ²	0.770	0.771	0.404
Num. obs.	41	41	41

*** $p < 0.01$; ** $p < 0.025$; * $p < 0.05$

Potential Market Shift – Ukraine War

Results somewhat positive for the climate. . .

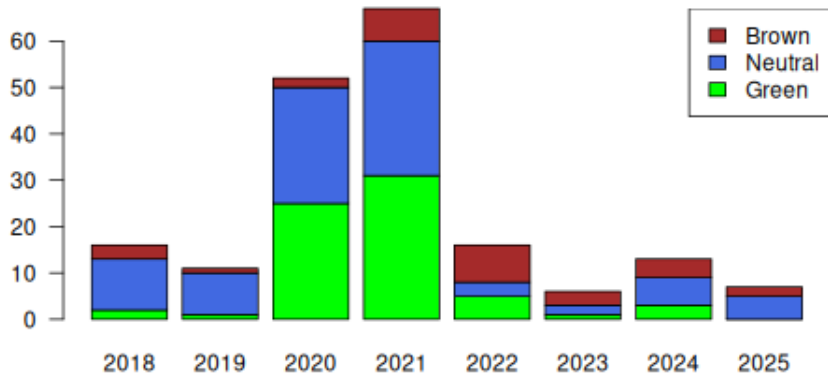
However

These results driven by the period 2018–2022.

Onset of war in Ukraine lead to changes, one of which seem to be the disappearance of the Green IPO.

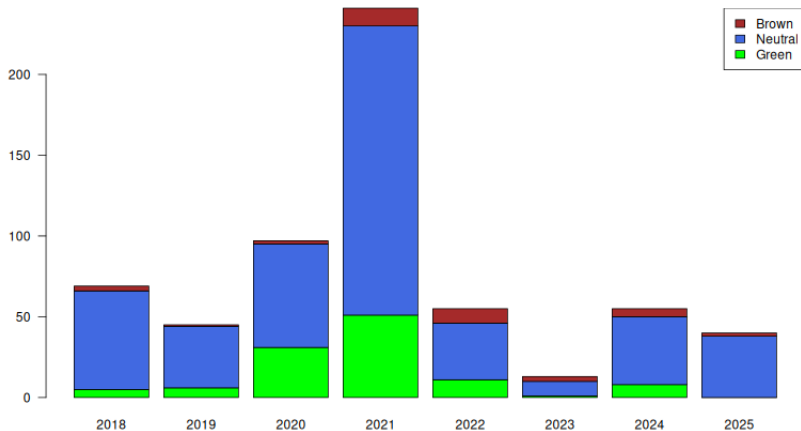
Potential Market Shift – Ukraine War

Breakdown of IPOs in Norway



Potential Market Shift – Ukraine War

Breakdown of IPOs the rest of the Nordics



Conclusion

Results (weakly) support link between ESG properties of firms and IPO issue price.

- All Nordics: Underpricing lower for green companies
- Norway: Implied cost of capital from ratio lower for green companies

However

- Results driven by period till 2022.
- Post-Ukraine – IPOs drying up, particularly green ones.

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