Is investment capital cheaper for green firms? Evidence from equity issues at Euronext – Oslo

Erika Berle, Kjell Jørgensen and Bernt Arne Ødegaard

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(Very Preliminary)

Overview

1. Research Issue
2. Literature
3. Data and Economic Environment
   - The Oslo Stock Exchange (now Euronext Oslo)
   - IPO's/listings
   - Stock Market Data
   - ESG data
4. Is IPO underpricing influenced by ESG?
5. Post IPOs
6. Conclusion

Research issue

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.

Question: Is "green" investment different?

- Do investor demand different returns depending on ESG properties? E.g.
  - Is there an additional "green glow"?
    $\rightarrow$ investors demand less return from green projects (subsidized financing)
  - Reluctance to finance "brown" projects (exclusions)?
    $\rightarrow$ brown projects have to offer higher returns?

$\rightarrow$ Investigate in context of recent Norwegian IPO (Initial Public Offers)

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)

  $\rightarrow$ Green stocks higher return
- The non-pecuniary view (ESG in utility function)
  - Equilibrium models – tradeoff ESG/Cost of Capital
    – Pástor et al. (2021) Pedersen et al. (2021)
  - ESG ranking uncertainty muddle tradeoff (Avramov et al., 2022)

  $\rightarrow$ Green stocks lower return

Literature - ESG and stock returns

What is a reasonable magnitude of a green premium?

Cost of improving ESG argument

The return difference is a tradeoff between:

- Cost of removing reasons for exclusion (becoming more ethical)
- Benefits from lower cost of capital.

Example from (Hong, Wang, and Yang, 2023) (decarbonization):
Equilibrium return difference (green premium)$= -m/q$,
(m – cost of mitigation per unit of production, q – price of firm capital.
$\rightarrow$ If green premium reflects costs of mitigation,
green return premium can be large in magnitude

Arbitrage type counterargument (Berk and van Binsbergen, 2022)

Investors not concerned with ESG jump on return premium
$\rightarrow$ Green premium should be small in magnitude.

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, 2022) (-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
  - Exhanges: Create menu of market places, differing on
    - Direct cost of being listed
    - Listing requirements
    - Regulation

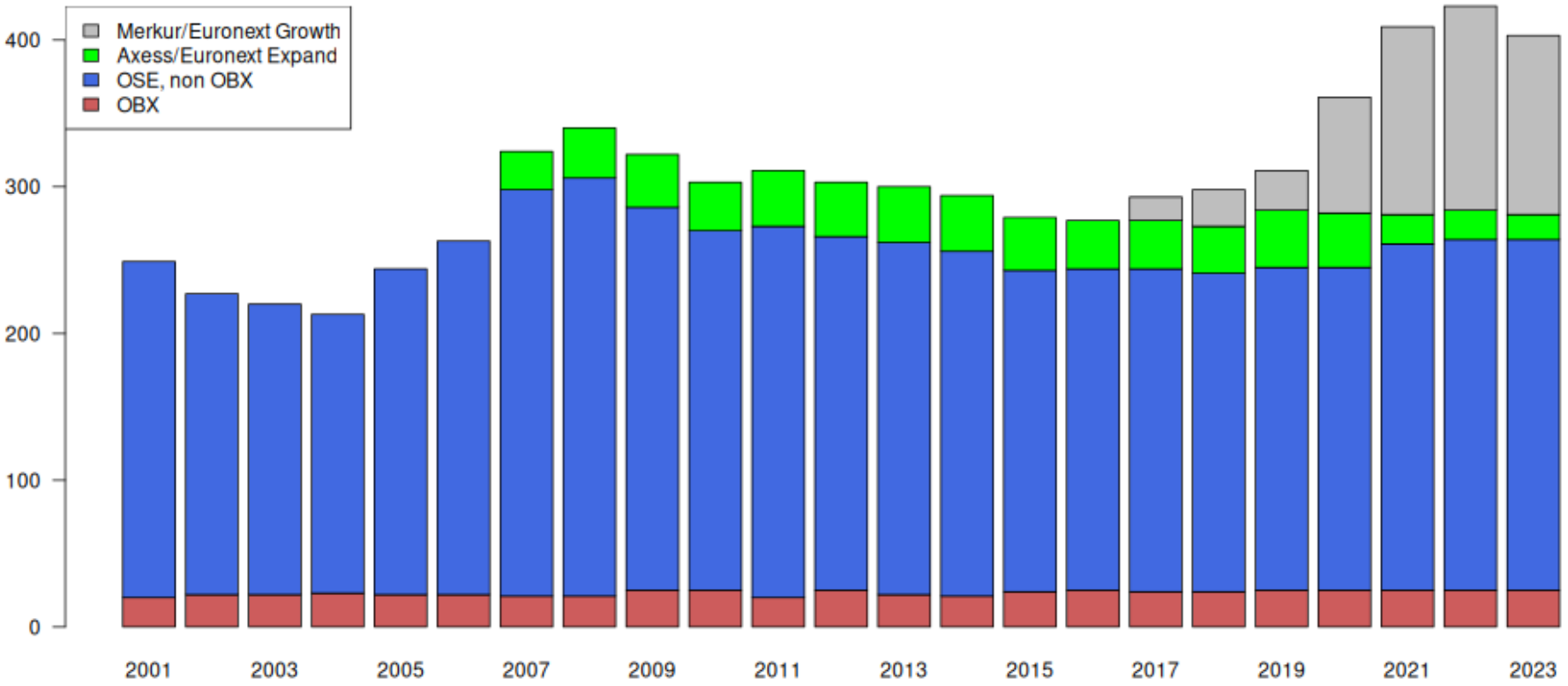
Our research – ESG in context of IPOs

Argument from asset pricing discussion:
$\rightarrow$ Cost of capital depend on ESG – Directly transferrable to IPO pricing?
In context of IPOs

- Estimate first day reaction (underpricing)
  - If green firms less underpriced (to be tested)
    - Are firms able to set a higher issue price?
      (Less money left on the table)
    - Or is it just the first day reaction, not flowing to firms?
- Post-IPO returns: Return difference green/brown stocks?

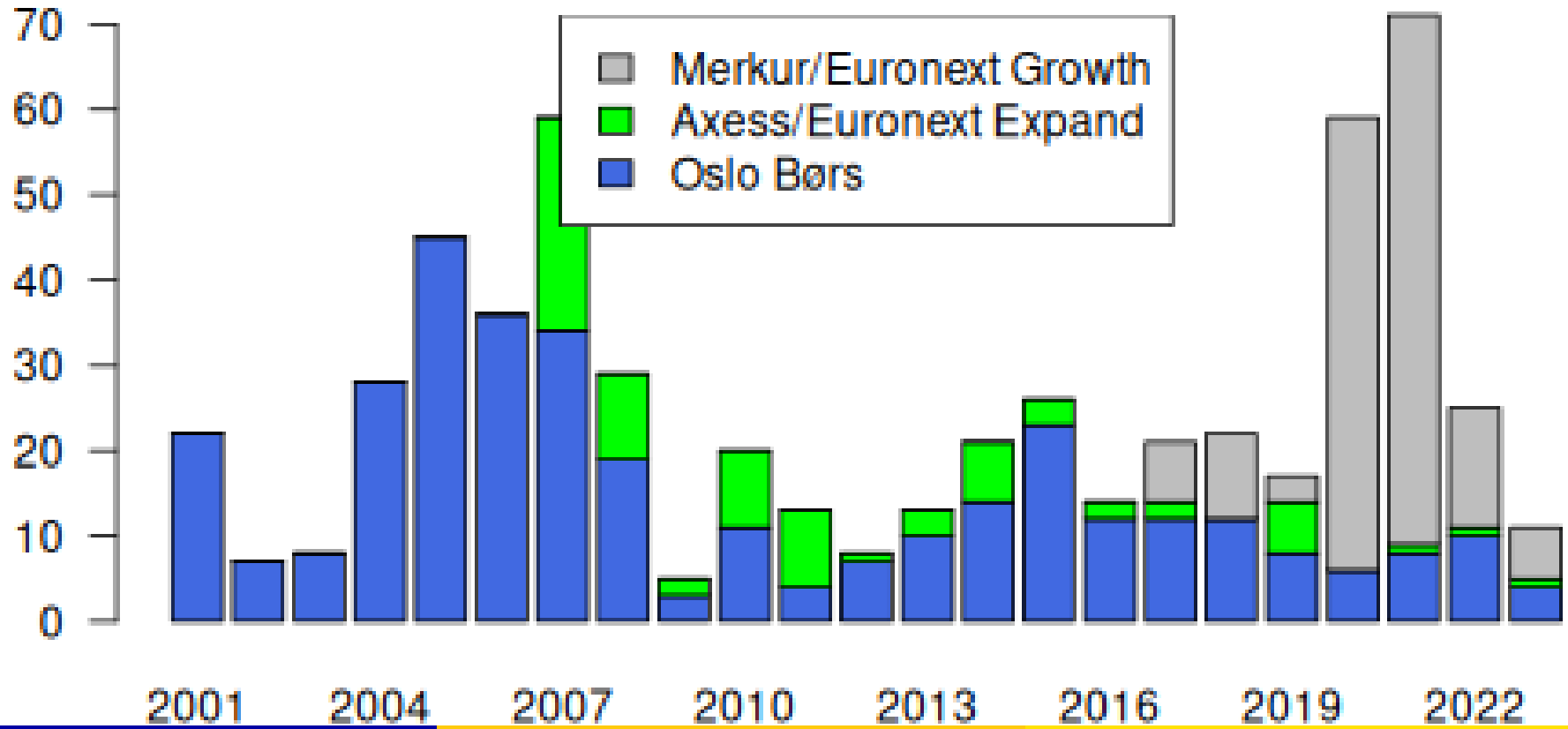
Data - Stocks traded at the OSE / Euronext Oslo

- Merkur / Euronext Growth
- Axess
- OSE



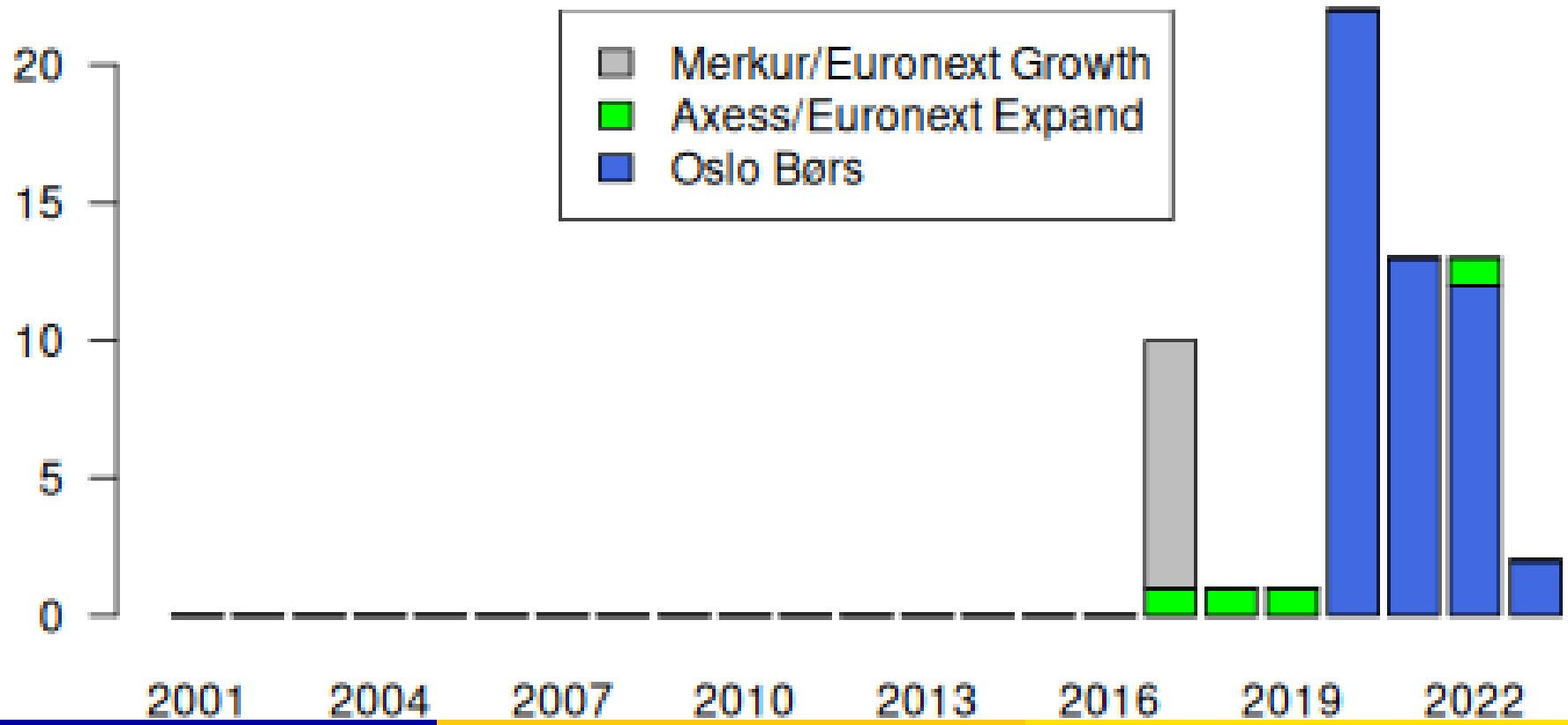
Data - IPO's Oslo

Panel A: IPO's by market



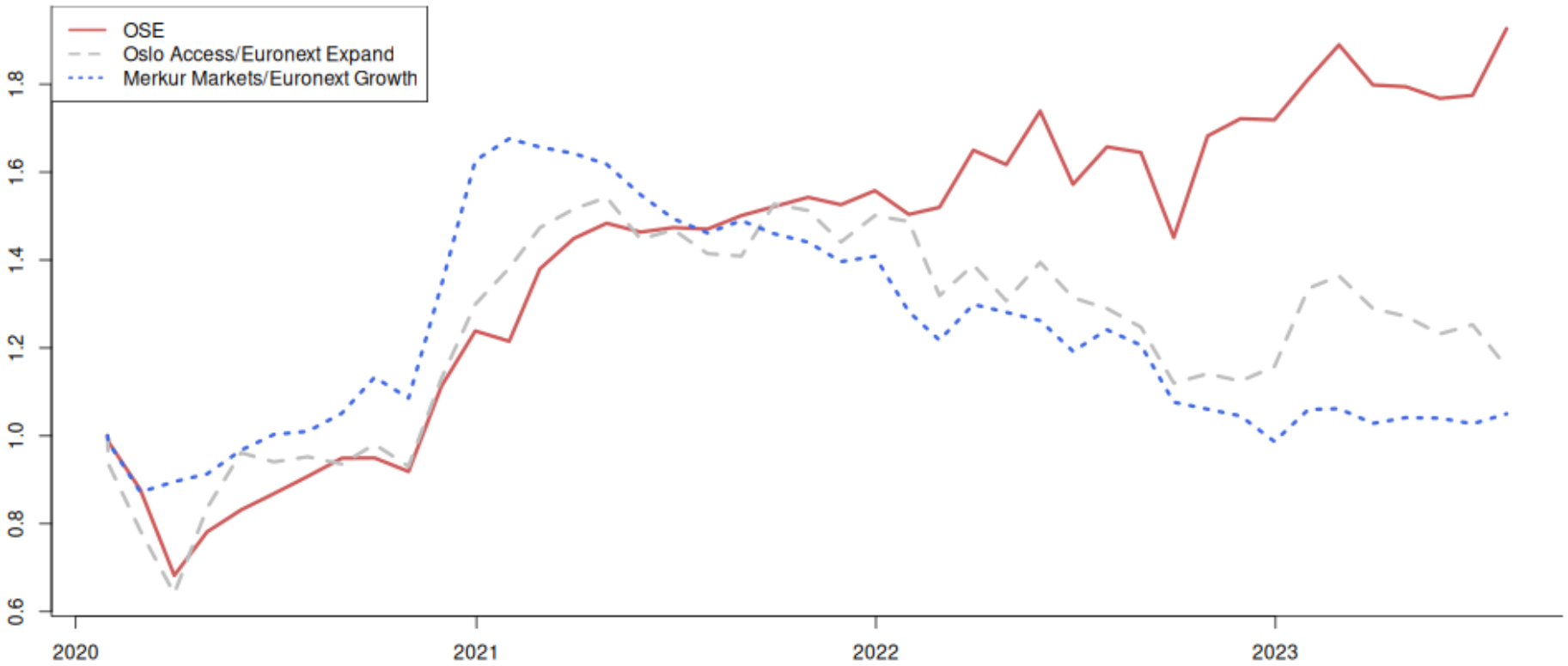
Data - market switches by year

Panel B: Which market is being swithced into



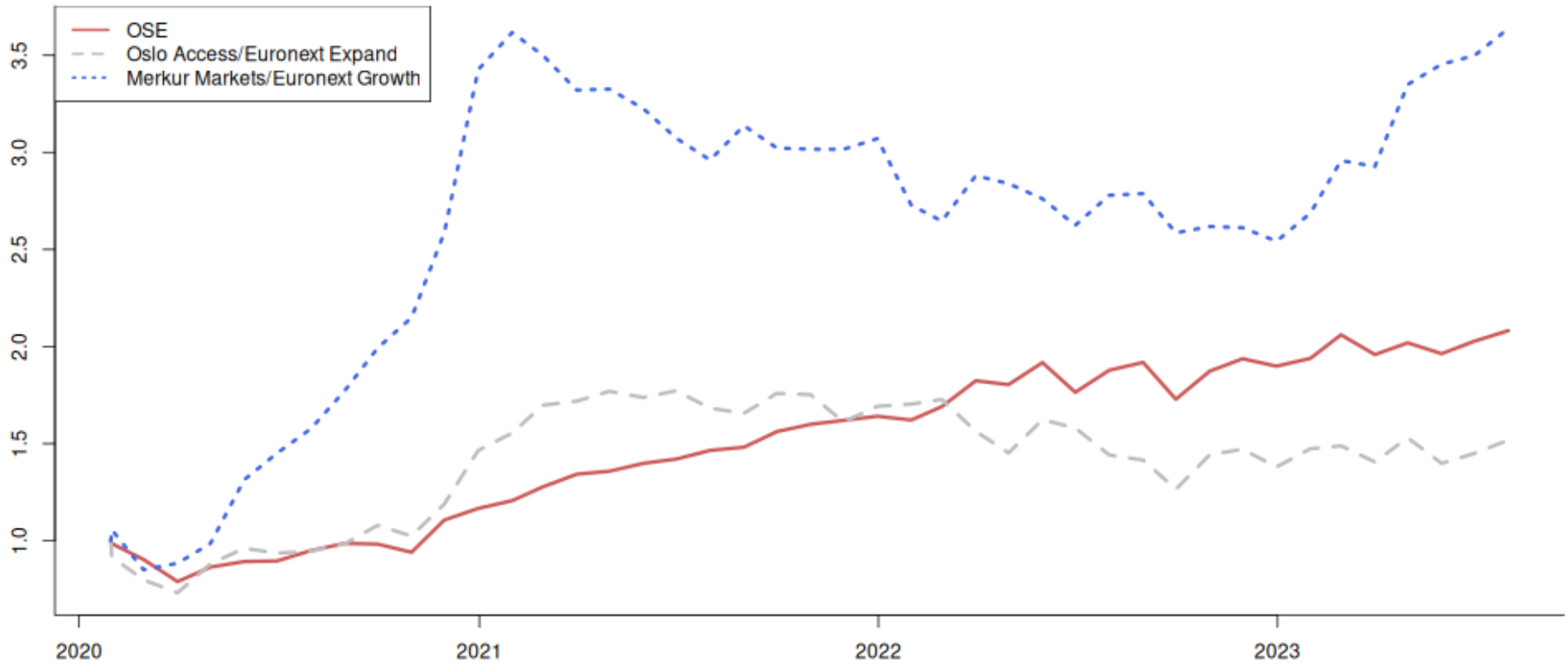
Data – Cumulative stock returns

Cumulative returns, EW (equally weighted)



Data – Cumulative stock returns

Cumulative returns, VW (value weighted)



Data – ESG - how to measure?

ESG - Environmental Social Governance
Of particular concern for this paper: E

- Environment
- Sustainability
- Climate

Data – ESG proxies – Inferring ESG from prospectus

- Collect prospectuses
- Analyze text:

  To what degree is the information in prospectuses
  Positive towards environment
  - ESG Environment

  Negative to environment
  - ESG Brown

Data – ESG proxies – Reported

New reporting requirements – Verified data

Examples

Variable	Unit	Definition
Scope1	tCO_2e	Direct greenhouse (GHG) emissions
Fossil Fuel Sector	(bool)	Derive revenue from coal a.o. fossil fuels
Carbon Target	(bool)	Have quantitative carbon reduction target(s)
Gender Pay Gap	Percentage	Average unadjusted gender pay gap

Data – ESG proxies – Green/Brown grouping

1. **Green**. Renewable energy. Sustainability innovation. Circular Economy.
2. **Neutral**. All firms not easily categorized. Example: Financials.
3. **Brown**. Oil and Gas related.

Describing manual categorization

IPOs since 2017.

	No Obs
Green	86
Neutral	103
Brown	39

Is IPO underpricing influenced by ESG?

First day premium – the typical measure of underpricing.
Does ESG properties of the company covary with the magnitude of underpricing?
If it easier for a green company to get capital, underpricing will be less.

Is IPO underpricing influenced by ESG?

Regressing First Day Return on prospectus-inferred ESG

	Dependent variable:					
	First Day Return					
	All IPOs			Merkur/Growth IPOs only		
	(1)	(2)	(3)	(4)	(5)	(6)
ln(ESG Environment)	−1.6	−1.3		−1.9	−1.4	
	(1.1)	(1.0)		(1.4)	(1.2)	
ln(ESG Brown)	0.3		−0.1	0.5		−0.1
	(0.6)		(0.6)	(0.9)		(0.7)
ln(MktCap)	0.3	0.2	−0.01	0.04	−0.1	−0.2
	(1.5)	(1.5)	(1.5)	(2.2)	(2.2)	(2.2)
Constant	−6.7	−5.6	1.1	−1.4	0.7	5.6
	(31.2)	(31.0)	(30.8)	(46.0)	(45.7)	(45.9)
Observations	125	125	125	93	93	93
Adjusted R^2	−0.01	−0.002	−0.02	−0.01	−0.01	−0.02
Note:						*p<0.1; **p<0.05; ***p<0.01

Is IPO underpricing influenced by ESG?

Regressing first day return on firm-level variables

	Dependent variable:			
	First Day Return			
	All IPOs		Merkur/Growth IPOs only	
	(1)	(2)	(3)	(4)
FossilFuel	−2.4		−0.3	
	(5.9)		(9.3)	
Scope1/EV		0.01		0.01
		(0.01)		(0.01)
ln(MktCap)	0.2	0.9	0.4	−0.7
	(1.3)	(0.9)	(1.8)	(1.3)
Constant	−3.0	−22.2	−7.0	8.9
	(28.0)	(19.8)	(38.5)	(27.8)
Observations	133	46	102	25
Adjusted R^2	−0.01	−0.01	−0.02	−0.02
Note:				*p<0.1; **p<0.05; ***p<0.01

Is IPO underpricing influenced by ESG?

Regressing first day return on green/brown categorization

	Dependent variable:					
	First Day Return					
	All IPOs			Merkur/Growth IPOs only		
	(1)	(2)	(3)	(4)	(5)	(6)
Green	−5.6	−4.6		−8.4*	−7.2	
	(3.5)	(3.3)		(4.6)	(4.4)	
Brown	−4.5		−2.3	−6.7		−2.7
	(4.7)		(4.5)	(7.6)		(7.4)
ln(MktCap)	−0.2	−0.2	−0.1	−0.4	−0.3	−0.4
	(1.0)	(1.0)	(1.1)	(1.6)	(1.6)	(1.6)
Constant	6.8	6.3	3.3	13.0	9.7	9.6
	(22.2)	(22.2)	(22.2)	(33.9)	(33.6)	(34.1)
Observations	171	171	171	120	120	120
Adjusted R^2	−0.001	−0.000	−0.01	0.004	0.01	−0.02
Note:						*p<0.1; **p<0.05; ***p<0.01

Is IPO underpricing influenced by ESG?

Results (roughly):

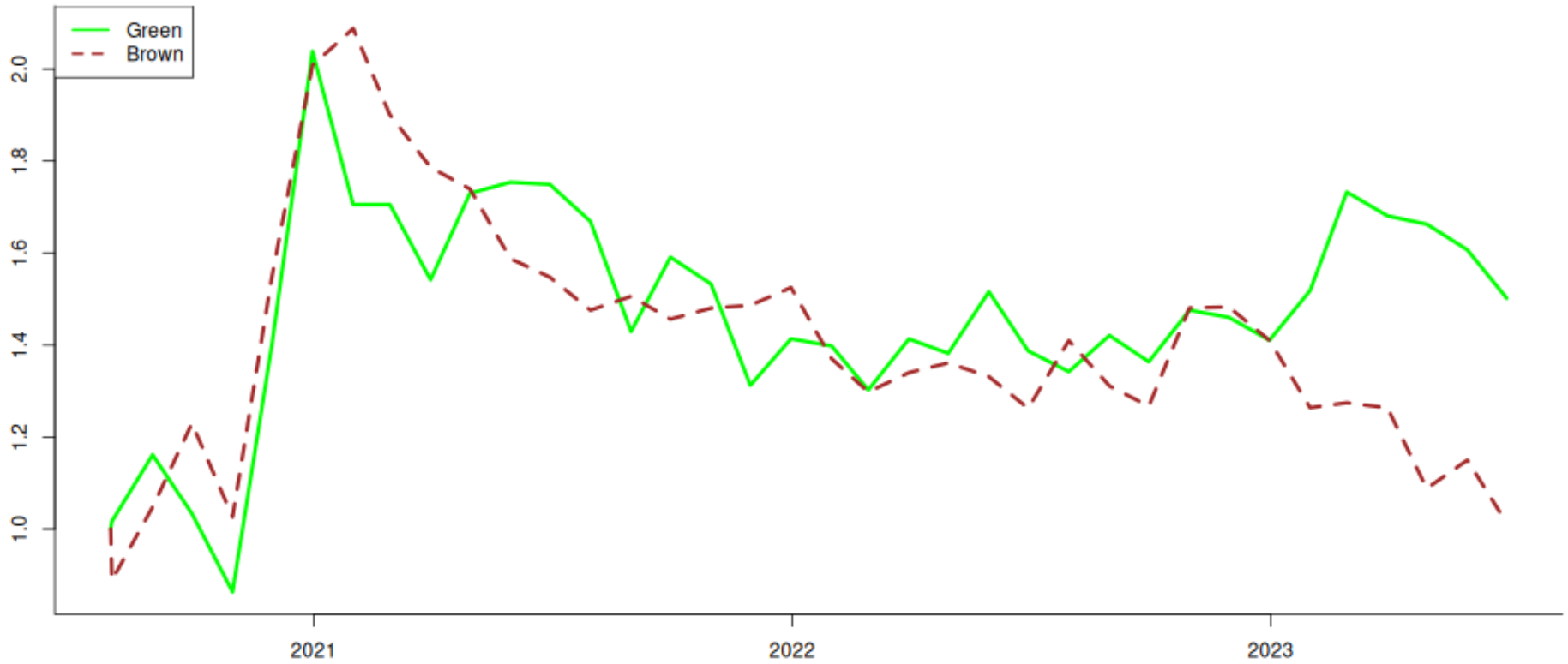
- Green (brown) firms less (more) underpriced

But can not really distinguish

- Issue price set higher (lower cost of capital)
- First day return flowing to initial investors.

Post-IPO returns – Green vs brown IPOs

Cumulative returns



Post-IPO returns – Green vs brown IPOs

Construct Difference Portfolio p: Green minus Brown (one year)

$$R_{pt} - R_{ft} = \alpha_p + b^m(R_{mt} - R_{ft}) + b^{HML} HML_t + b^{SMB} SMB_t$$

	Dependent variable:
	eRp
alpha	0.028*
	(0.016)
RMRF	−0.408
	(0.269)
HML	−0.556**
	(0.224)
SMB	−0.424
	(0.437)
Observations	54
Adjusted R^2	0.171
Note:	*p<0.1; **p<0.05; ***p<0.01

Post-IPO returns – Green vs brown IPOs

Green returns higher

Opposite results of most of the asset pricing literature.

Key takeaways

1. Research Question:
   Does ESG affect the terms of issuance of IPO's?
2. First day return:
   "Good ESG" – lower return (less underpricing)
   "Bad ESG" – higher return (more underpricing)
   Possibilities
   $\rightarrow$ Issuer set a higher issue price
   $\rightarrow$ Higher demand on first day
3. First year post-IPO
   Green stocks higher returns

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