

Do ESG considerations impact corporate default risk?

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Disclaimer: the views expressed in this presentation are solely those of the authors

[Finance & economics](#) | [Generation SRI](#)

Sustainable investment joins the mainstream

Millennials are coming into money and want to invest it responsibly

Business

Exclusive: Investors press companies on human rights in Xinjiang

The real impact of the ESG backlash

As opinions shift, asset managers like BlackRock are talking more about maximising returns than about saving the world

Investors pull cash from ESG funds as performance lags

Sustainability risks and asset prices

There are essentially two channels to explain the impact of sustainability risks on asset prices (Pastor et al. 2021, Pedersen 2021):

Risk channel



High ESG risks exposes firms to

- Regulatory risks
- Legal/reputational risks
- Transition risks...

Non-pecuniary channel



Investors with strong preference for ESG factors prioritize sustainable assets (regardless of/besides traditional risk-return considerations.)

What we do

- Analyse the impact of sustainability risks (proxied by ESG scores) on the **term structure of the probability of default (PD)** of euro-area non-financial corporations (NFCs)
- Use both PDs and Credit default swaps (CDS) to distinguish the impact of sustainability risks across **different channels**
- **Combine static and dynamic estimates:** the impact of sustainability on firms' credit risk varies over time, reflecting changes in investors' preference and variations in firms' exposure to sustainability risks
- Present estimates of the **ESG risk premium**

Why is important using PDs?

Compared to other **traded** financial assets, the use of PD has several advantages

1. Not affected by liquidity, forex, and market microstructure related issues including the credit spread puzzle (Collin-Dufresne et al. 2001)
2. Full term structure of available PDs from 1- to 10-year tenor (no missing maturities)
3. Allows for a forward looking dynamic estimate which is crucial for policymakers
4. It reflects info from the physical distribution and not from the risk neutral distribution (such as CDSs) → provide info on the risk-channel of the ESG factor

Data

- 700 non-financial companies listed in the Eurostoxx 600 index from 2014 to 2022
- Monthly EDF from Moody's for the 1-, 3-, 5-, 10-year horizon. [▶ PD](#) [▶ Slope](#)
- Annual ESG ratings from Refinitiv (robustness with Sustainalytics, Robeco, S&P);
- Control variables are historical annual balance sheet data, from Refinitiv, and monthly company ratios, from IBES
- Estimate concerns on ESG topics via NL analytics [▶ NL](#)

Model specification

We estimate the following regression model:

$$PD_{i,t,y} = \alpha_0 + S_i + C_j + T_{t,y} + \beta ESG_{i,y-1} + \gamma_0 Z_{i,y-1} + \gamma_1 X_{i,t-1,y} + \varepsilon_{i,t,y}$$

- $PD_{i,t,y}$ is the average PD for firm i in month t of year y
- S_i are industrial sector fixed-effects
- C_j are country fixed-effects
- $T_{t,y}$ are time (monthly) fixed-effects
- ESG is the lagged annual ESG score of firm i : our key regressor
- $Z_{i,y-1}$ and $X_{i,t-1,y}$ are firm specific controls \Rightarrow leverage, ICR, Cash, EPS, PE, ROE (low/high frequency)
- $\varepsilon_{i,t,y}$ is a standard error term

Baseline estimation - static

VARIABLES	PD 1yr	PD 3yr	PD 5yr	PD 10yr
ESG score	-0.039*** (0.003)	-0.068*** (0.004)	-0.093*** (0.004)	-0.153*** (0.003)
Leverage	0.178*** (0.006)	0.222*** (0.007)	0.217*** (0.006)	0.165*** (0.005)
ICR	-0.027*** (0.006)	-0.057*** (0.009)	-0.076*** (0.010)	-0.079*** (0.013)
Total assets	-0.067*** (0.003)	-0.097*** (0.004)	-0.110*** (0.004)	-0.121*** (0.004)
PPE/assets	-0.051*** (0.005)	-0.050*** (0.005)	-0.044*** (0.005)	-0.034*** (0.004)
Buy recomm.	-0.113*** (0.005)	-0.119*** (0.005)	-0.107*** (0.005)	-0.073*** (0.004)
EPS (fwd)	-0.063*** (0.003)	-0.081*** (0.003)	-0.084*** (0.003)	-0.073*** (0.003)
PE (fwd)	-0.009* (0.005)	-0.012** (0.006)	-0.013* (0.007)	-0.010 (0.007)
ROE (fwd)	-0.032*** (0.009)	-0.036*** (0.011)	-0.036*** (0.011)	-0.027*** (0.009)
Observations	58,386	58,386	58,386	58,386
R-squared	0.21	0.28	0.31	0.40

- A 1 st.d. increase in the ESG score implies a reduction in the range of 0.04-0.15 p.p. (up to 15% average PDs)
- Larger impact on long-term PDs: **trade off short-long term between financial/sustainability risks**

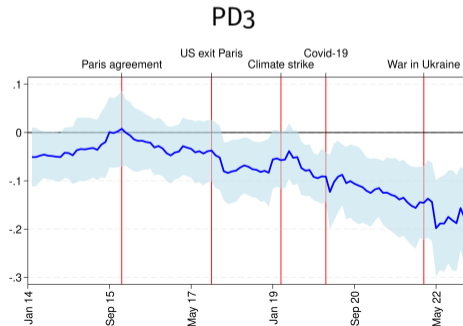
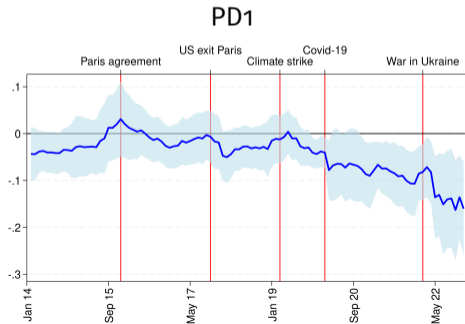
Robustness and extensions

- Results are robust to the exclusion of the energy and utility sectors (with energy firms slightly higher impact) **Industrial** **No energy** **No utilities**
- The impact is larger in the second half of the sample (wake-up call Covid-19) **Post 2020**
- The ESG impact on the PD is amplified when ESG concerns are rising **Interaction**
- Results are qualitatively similar using alternative ESG score methodologies **Other ESG**
- Individual ESG scores/Emiss. also have a decreasing impact on the PD **Env.** **Soc.** **Gov.** **Emiss.**
- The ESG score has a flattening impact on the PD slope **Slope**
- Results are qualitatively similar using an annual frequency or ESG monthly interpolated score **Annual** **Interpolated**
- The ESG score has a decreasing impact on the volatility of PD **Volat.**

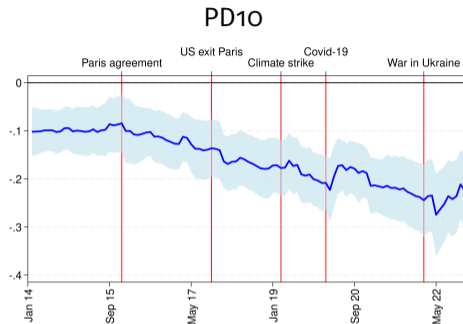
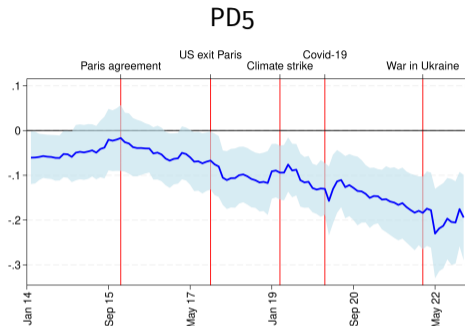
Dynamic estimation - 1

- We want to analyze the dynamic impact of sustainability risks on firms' creditworthiness (time variation in the materiality of sustainability risks)
- Estimate the baseline model without pooling (plot the cross-sectional estimates of β over time)

$$PD_{i,t,y,M} = \alpha_0 + S_i + C_i + T_{t,y} + \beta ESG_{i,y-1} \times T_t + \gamma_0 Z_{i,y-1} + \gamma_1 X_{i,t-1} + \varepsilon_{i,t}$$



Dynamic estimation - 2



- On average better ESG scores are negatively reflected into corporate PDs
- The magnitude of the effect (in absolute terms) is increasing over time, with a noticeable trend beginning from the 2015 Paris Agreement (more stringent environmental regulation).
- Upward **temporary** movements for Covid-19 and Russia's invasion of Ukraine: corporate risks primarily focused on corporate liquidity and viability (e.g. FSB, 2020 and Acharya and Steffen, 2020) rather than longer-term risk factors.

ESG risk premia - 1

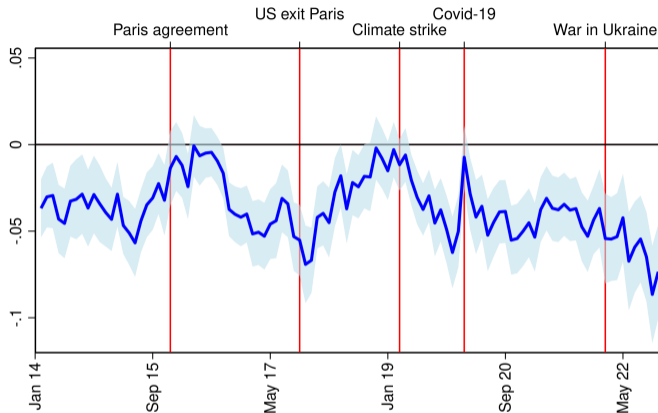
- The price of **traded** financial assets reflects how risk factors are priced-in from the perspective of a risk neutral investor
- It reflects two components: **impact of sustainability risks on corporate profitability and viability + investors' preferences/disutility towards sustainability risks**
- Extract a proxy of the ESG risk premium (RP) by purging out the inherent credit risk component from 5-year CDS spreads (Berndt et al., 2005).

$$Spread_{i,t,y} = \alpha_0 + S_i + C_i + T_{t,y} + \sum_{j=0}^1 \beta_j PD_{i,t-j,y} + \varepsilon_{i,t,y}$$

- Analyse the dynamic interlink of the risk premium with ESG attributes as follows:

$$RP_{i,t,y} = \alpha_0 + \beta ESG_{i,y-1} \times T_{t,y} + \varepsilon_{i,t,y}$$

ESG risk premia - 2

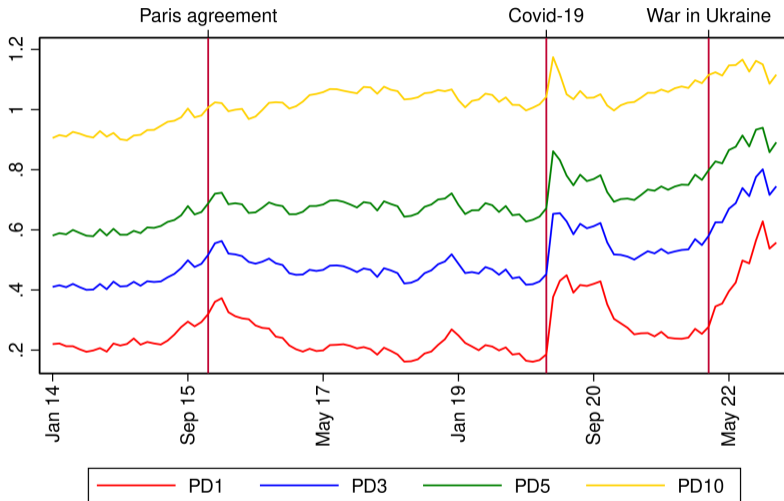


- On average **investors demand compensation** for firms with higher sustainability risks (but **no clear-cut negative trend**)
- **Ebb and flow of the ESG premium:** magnitude increases after periods of major shocks to ESG concerns (e.g. Paris Agreement, the Covid-19 recovery “green wake-up call”) and decreases during period of financial distress (e.g. the Covid-19 turmoil) or with less climate-friendly political administrations

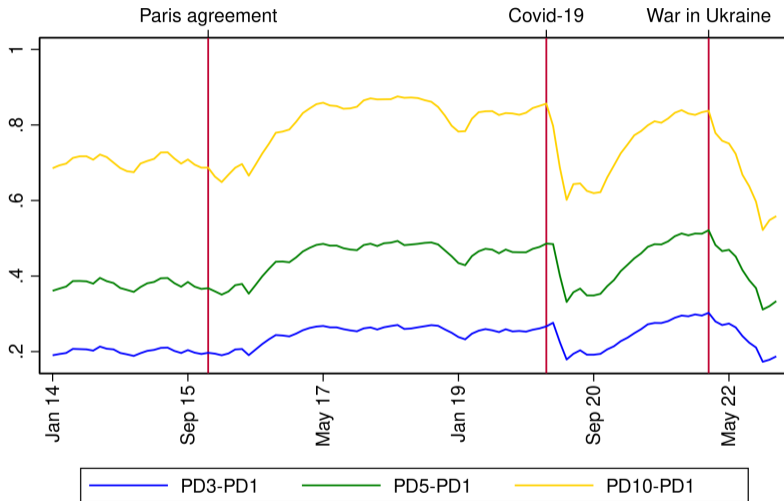
Conclusions

- We analyse the **two channels** through which ESG risks can affect firms' viability and corporate asset prices
- We find robust evidence of a **negative correlation between firms' sustainability profiles and their creditworthiness**, with a more pronounced effect observed as the time horizon of default probability increases.
- We document the **existence of a negative ESG premium**, with investors demanding higher compensation for firms with higher sustainability
- **The impact of sustainability on both channels varies over time**, in particular for the risk premium component reflecting the dynamics of investors' and consumers' tastes towards ESG risks.

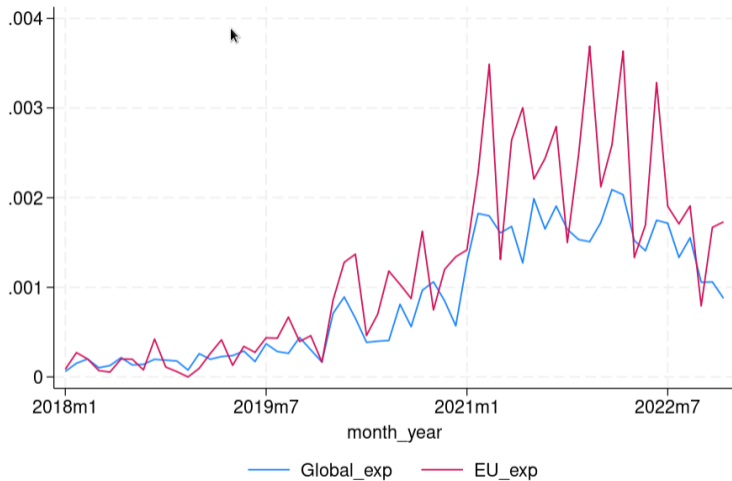
Average probability of default



Term structure slope



Firms' concerns over ESG risks



Only industrial firms

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG score	-0.030*** (0.003)	-0.052*** (0.004)	-0.072*** (0.004)	-0.127*** (0.003)
Leverage	0.130*** (0.005)	0.173*** (0.006)	0.174*** (0.006)	0.131*** (0.005)
ICR	-0.026*** (0.005)	-0.052*** (0.008)	-0.070*** (0.010)	-0.075*** (0.012)
Total assets	-0.028*** (0.002)	-0.044*** (0.003)	-0.055*** (0.003)	-0.075*** (0.003)
PPE/assets	0.000 (0.004)	0.009* (0.005)	0.011** (0.005)	0.004 (0.004)
Buy recomm.	-0.090*** (0.005)	-0.100*** (0.005)	-0.092*** (0.005)	-0.065*** (0.004)
EPS (fwd)	-0.053*** (0.002)	-0.069*** (0.003)	-0.072*** (0.003)	-0.065*** (0.002)
PE (fwd)	-0.008** (0.004)	-0.011** (0.005)	-0.011* (0.006)	-0.009 (0.006)
ROE (fwd)	-0.022*** (0.007)	-0.027*** (0.008)	-0.027*** (0.009)	-0.021*** (0.008)
Observations	51,644	51,644	51,644	51,644
R-squared	0.16	0.22	0.26	0.38

Excluding energy firms

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG score	-0.033*** (0.003)	-0.055*** (0.003)	-0.076*** (0.003)	-0.131*** (0.003)
Leverage	0.121*** (0.005)	0.163*** (0.006)	0.167*** (0.005)	0.128*** (0.004)
ICR	-0.030*** (0.005)	-0.056*** (0.008)	-0.073*** (0.010)	-0.077*** (0.012)
Total assets	-0.017*** (0.002)	-0.032*** (0.003)	-0.043*** (0.003)	-0.063*** (0.003)
PPE/assets	-0.007* (0.004)	0.003 (0.005)	0.007 (0.004)	0.007* (0.004)
Buy recomm.	-0.088*** (0.004)	-0.098*** (0.005)	-0.090*** (0.005)	-0.064*** (0.004)
EPS (fwd)	-0.055*** (0.002)	-0.071*** (0.003)	-0.074*** (0.003)	-0.067*** (0.002)
PE (fwd)	-0.008** (0.004)	-0.010** (0.005)	-0.011* (0.006)	-0.008 (0.006)
ROE (fwd)	-0.022*** (0.006)	-0.025*** (0.008)	-0.025*** (0.008)	-0.018*** (0.007)
Observations	54,625	54,625	54,625	54,625
R-squared	0.15	0.22	0.26	0.39

Excluding utilities firms

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG score	-0.038*** (0.004)	-0.067*** (0.004)	-0.092*** (0.004)	-0.152*** (0.003)
Leverage	0.191*** (0.006)	0.235*** (0.007)	0.229*** (0.007)	0.172*** (0.005)
ICR	-0.023*** (0.006)	-0.053*** (0.009)	-0.073*** (0.010)	-0.077*** (0.013)
Total assets	-0.084*** (0.004)	-0.117*** (0.005)	-0.131*** (0.005)	-0.140*** (0.005)
PPE/assets	-0.048*** (0.005)	-0.048*** (0.006)	-0.044*** (0.006)	-0.039*** (0.005)
Buy recomm.	-0.116*** (0.005)	-0.122*** (0.005)	-0.109*** (0.005)	-0.074*** (0.004)
EPS (fwd)	-0.061*** (0.003)	-0.078*** (0.003)	-0.081*** (0.003)	-0.071*** (0.003)
PE (fwd)	-0.009* (0.005)	-0.012* (0.006)	-0.013* (0.007)	-0.011 (0.007)
ROE (fwd)	-0.032*** (0.009)	-0.037*** (0.011)	-0.037*** (0.012)	-0.030*** (0.010)
Observations	55,405	55,405	55,405	55,405
R-squared	0.22	0.28	0.31	0.39

Alternative ESG scores

VARIABLES	PD 1	PD 3	PD 5	PD 10
Robeco ESG	-0.079*** (0.005)	-0.112*** (0.005)	-0.127*** (0.005)	-0.147*** (0.004)
Observations	30,902	30,902	30,902	30,902
R-squared	0.19	0.25	0.30	0.40
Bloomberg ESG	-0.044*** (0.005)	-0.070*** (0.006)	-0.089*** (0.005)	-0.129*** (0.005)
Observations	42,300	42,300	42,300	42,300
R-squared	0.20	0.27	0.31	0.39
Sustainalytics ESG	-0.117*** (0.011)	-0.194*** (0.012)	-0.225*** (0.011)	-0.246*** (0.010)
Observations	21,185	21,185	21,185	21,185
R-squared	0.26	0.32	0.36	0.43

Environmental score

VARIABLES	PD 1	PD 3	PD 5	PD 10
Env. score	-0.028*** (0.004)	-0.053*** (0.004)	-0.078*** (0.004)	-0.136*** (0.003)
Leverage	0.178*** (0.006)	0.222*** (0.007)	0.218*** (0.006)	0.168*** (0.005)
ICR	-0.027*** (0.007)	-0.049*** (0.009)	-0.057*** (0.011)	-0.027** (0.011)
Total assets	-0.071*** (0.003)	-0.102*** (0.004)	-0.115*** (0.004)	-0.128*** (0.004)
PPE/assets	-0.048*** (0.005)	-0.045*** (0.005)	-0.038*** (0.005)	-0.024*** (0.004)
Buy recomm.	-0.113*** (0.005)	-0.119*** (0.005)	-0.107*** (0.005)	-0.075*** (0.004)
EPS (fwd)	-0.061*** (0.003)	-0.079*** (0.003)	-0.082*** (0.003)	-0.069*** (0.003)
PE (fwd)	-0.009* (0.005)	-0.012* (0.006)	-0.013* (0.007)	-0.010 (0.006)
ROE (fwd)	-0.030*** (0.008)	-0.034*** (0.010)	-0.033*** (0.010)	-0.025*** (0.009)
Observations	57,962	57,962	57,962	57,962
R-squared	0.22	0.28	0.32	0.40

Social score

VARIABLES	PD 1	PD 3	PD 5	PD 10
Soc. score	-0.050*** (0.004)	-0.084*** (0.004)	-0.108*** (0.004)	-0.160*** (0.003)
Leverage	0.178*** (0.006)	0.221*** (0.007)	0.216*** (0.006)	0.162*** (0.005)
ICR	-0.028*** (0.006)	-0.059*** (0.009)	-0.078*** (0.010)	-0.078*** (0.013)
Total assets	-0.066*** (0.004)	-0.095*** (0.004)	-0.109*** (0.004)	-0.125*** (0.004)
PPE/assets	-0.050*** (0.005)	-0.047*** (0.005)	-0.042*** (0.005)	-0.030*** (0.004)
Buy recomm.	-0.114*** (0.005)	-0.119*** (0.005)	-0.107*** (0.005)	-0.073*** (0.004)
EPS (fwd)	-0.063*** (0.003)	-0.081*** (0.003)	-0.085*** (0.003)	-0.074*** (0.003)
PE (fwd)	-0.009* (0.005)	-0.012** (0.006)	-0.013* (0.007)	-0.010 (0.006)
ROE (fwd)	-0.033*** (0.009)	-0.037*** (0.011)	-0.037*** (0.011)	-0.030*** (0.010)
Observations	58,386	58,386	58,386	58,386
R-squared	0.22	0.28	0.32	0.40

Corporate governance score

VARIABLES	PD 1	PD 3	PD 5	PD 10
Gov. score	-0.003 (0.003)	-0.009*** (0.003)	-0.016*** (0.003)	-0.038*** (0.003)
Leverage	0.176*** (0.006)	0.219*** (0.007)	0.213*** (0.006)	0.160*** (0.005)
ICR	-0.021*** (0.006)	-0.048*** (0.009)	-0.064*** (0.010)	-0.059*** (0.013)
Total assets	-0.079*** (0.003)	-0.117*** (0.004)	-0.136*** (0.004)	-0.163*** (0.004)
PPE/assets	-0.052*** (0.005)	-0.052*** (0.006)	-0.047*** (0.005)	-0.039*** (0.005)
Buy recomm.	-0.111*** (0.005)	-0.116*** (0.005)	-0.102*** (0.005)	-0.066*** (0.004)
EPS (fwd)	-0.063*** (0.003)	-0.081*** (0.003)	-0.085*** (0.003)	-0.075*** (0.003)
PE (fwd)	-0.008* (0.004)	-0.012* (0.006)	-0.012* (0.007)	-0.009 (0.006)
ROE (fwd)	-0.032*** (0.009)	-0.037*** (0.011)	-0.036*** (0.011)	-0.028*** (0.009)
Observations	58,386	58,386	58,386	58,386
R-squared	0.21	0.27	0.31	0.38

Emission intensity

VARIABLES	PD 1	PD 3	PD 5	PD 10
Emission intensity	0.027*** (0.006)	0.031*** (0.007)	0.029*** (0.007)	0.023*** (0.005)
Leverage	0.202*** (0.007)	0.251*** (0.007)	0.248*** (0.007)	0.196*** (0.006)
ICR	-0.038*** (0.008)	-0.063*** (0.012)	-0.072*** (0.015)	-0.050*** (0.013)
Total assets	-0.087*** (0.004)	-0.130*** (0.005)	-0.150*** (0.005)	-0.178*** (0.005)
PPE/assets	-0.073*** (0.006)	-0.078*** (0.006)	-0.073*** (0.006)	-0.054*** (0.005)
Buy recomm.	-0.113*** (0.006)	-0.112*** (0.006)	-0.095*** (0.006)	-0.056*** (0.004)
EPS (fwd)	-0.063*** (0.003)	-0.082*** (0.004)	-0.085*** (0.004)	-0.073*** (0.003)
PE (fwd)	-0.008 (0.005)	-0.010 (0.006)	-0.009 (0.006)	-0.006 (0.005)
ROE (fwd)	-0.037*** (0.011)	-0.043*** (0.013)	-0.042*** (0.013)	-0.032*** (0.010)
Observations	49,331	49,331	49,331	49,331
R-squared	0.24	0.30	0.34	0.40

Annual frequency

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG score	-0.040*** (0.011)	-0.072*** (0.012)	-0.098*** (0.012)	-0.158*** (0.011)
Leverage	0.172*** (0.019)	0.215*** (0.021)	0.211*** (0.021)	0.159*** (0.017)
Cash	-0.056*** (0.012)	-0.079*** (0.015)	-0.089*** (0.016)	-0.099*** (0.016)
Buy recomm.	-0.130*** (0.016)	-0.139*** (0.018)	-0.129*** (0.017)	-0.097*** (0.014)
ICR	-0.042* (0.022)	-0.072** (0.031)	-0.089** (0.036)	-0.084** (0.043)
EPS (fwd)	-0.061*** (0.009)	-0.080*** (0.011)	-0.083*** (0.011)	-0.072*** (0.009)
PE (fwd)	-0.002 (0.005)	0.003 (0.005)	0.009 (0.007)	0.016* (0.010)
ROE (fwd)	-0.013 (0.010)	-0.010 (0.012)	-0.006 (0.011)	0.004 (0.008)
Observations	4,921	4,921	4,921	4,921
R-squared	0.24	0.29	0.33	0.41

Back

Interpolated ESG scores

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG interp.	-0.042*** (0.003)	-0.072*** (0.004)	-0.096*** (0.004)	-0.154*** (0.003)
Leverage	0.173*** (0.006)	0.217*** (0.007)	0.214*** (0.006)	0.164*** (0.005)
ICR	-0.022*** (0.006)	-0.051*** (0.008)	-0.069*** (0.010)	-0.071*** (0.012)
Total assets	-0.067*** (0.003)	-0.096*** (0.004)	-0.108*** (0.004)	-0.119*** (0.004)
PPE/assets	-0.039*** (0.005)	-0.038*** (0.005)	-0.034*** (0.005)	-0.027*** (0.004)
Buy recomm.	-0.100*** (0.005)	-0.104*** (0.005)	-0.092*** (0.005)	-0.062*** (0.004)
EPS (fwd)	-0.055*** (0.003)	-0.073*** (0.003)	-0.077*** (0.003)	-0.068*** (0.003)
PE (fwd)	-0.007* (0.004)	-0.010* (0.006)	-0.011* (0.006)	-0.009 (0.006)
ROE (fwd)	-0.031*** (0.009)	-0.035*** (0.010)	-0.035*** (0.011)	-0.027*** (0.009)
Observations	55,906	55,906	55,906	55,906
R-squared	0.22	0.28	0.32	0.40

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG score	-0.020*** (0.004)	-0.044*** (0.004)	-0.068*** (0.004)	-0.130*** (0.004)
ESG × dummy 2020	-0.069*** (0.007)	-0.087*** (0.008)	-0.090*** (0.008)	-0.083*** (0.007)
Leverage	0.179*** (0.006)	0.223*** (0.007)	0.218*** (0.006)	0.166*** (0.005)
ICR	-0.023*** (0.006)	-0.053*** (0.009)	-0.072*** (0.010)	-0.075*** (0.013)
Total assets	-0.066*** (0.003)	-0.096*** (0.004)	-0.108*** (0.004)	-0.120*** (0.004)
PPE/assets	-0.052*** (0.005)	-0.051*** (0.005)	-0.045*** (0.005)	-0.035*** (0.004)
Buy recomm.	-0.113*** (0.005)	-0.118*** (0.005)	-0.106*** (0.005)	-0.072*** (0.004)
EPS (fwd)	-0.063*** (0.003)	-0.081*** (0.003)	-0.084*** (0.003)	-0.074*** (0.003)
PE (fwd)	-0.009* (0.005)	-0.012** (0.006)	-0.013* (0.007)	-0.011 (0.007)
ROE (fwd)	-0.032*** (0.009)	-0.036*** (0.011)	-0.035*** (0.011)	-0.027*** (0.009)
Observations	58,386	58,386	58,386	58,386
R-squared	0.22	0.28	0.32	0.40

Slope

VARIABLES	PD 1-3	PD 1-5	PD 1-10
ESG score	-0.029*** (0.001)	-0.054*** (0.002)	-0.114*** (0.002)
Leverage	0.044*** (0.002)	0.039*** (0.002)	-0.013*** (0.003)
ICR	-0.031*** (0.004)	-0.050*** (0.006)	-0.052*** (0.010)
Total assets	-0.030*** (0.001)	-0.042*** (0.002)	-0.054*** (0.002)
PPE/assets	0.002 (0.002)	0.007*** (0.002)	0.018*** (0.003)
Buy recomm.	-0.006*** (0.001)	0.007*** (0.002)	0.040*** (0.003)
EPS (fwd)	-0.018*** (0.001)	-0.022*** (0.001)	-0.011*** (0.001)
PE (fwd)	-0.003* (0.002)	-0.004 (0.003)	-0.002 (0.004)
ROE (fwd)	-0.004** (0.002)	-0.004 (0.002)	0.005** (0.002)
Observations	58,386	58,386	58,386
R-squared	0.28	0.31	0.35

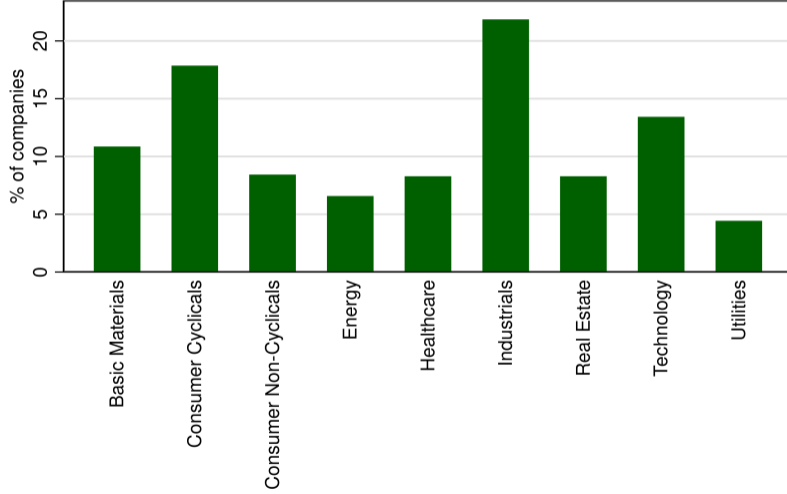
Volatility of PD (2M interval)

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG score	-0.003*** (0.001)	-0.005*** (0.000)	-0.006*** (0.000)	-0.005*** (0.000)
Leverage	0.016*** (0.001)	0.012*** (0.001)	0.010*** (0.001)	0.006*** (0.000)
Cash		-0.006*** (0.000)	-0.005*** (0.000)	-0.004*** (0.000)
Buy recomm.	-0.008*** (0.001)	-0.006*** (0.001)	-0.004*** (0.001)	-0.002*** (0.000)
ICR	-0.007*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.006*** (0.001)
EPS (fwd)	-0.008*** (0.000)	-0.008*** (0.000)	-0.007*** (0.000)	-0.005*** (0.000)
PE (fwd)	-0.001* (0.000)	-0.001* (0.001)	-0.001* (0.001)	-0.001* (0.000)
ROE (fwd)	-0.003*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
Observations	57,451	57,290	57,290	57,290
R-squared	0.14	0.16	0.17	0.18

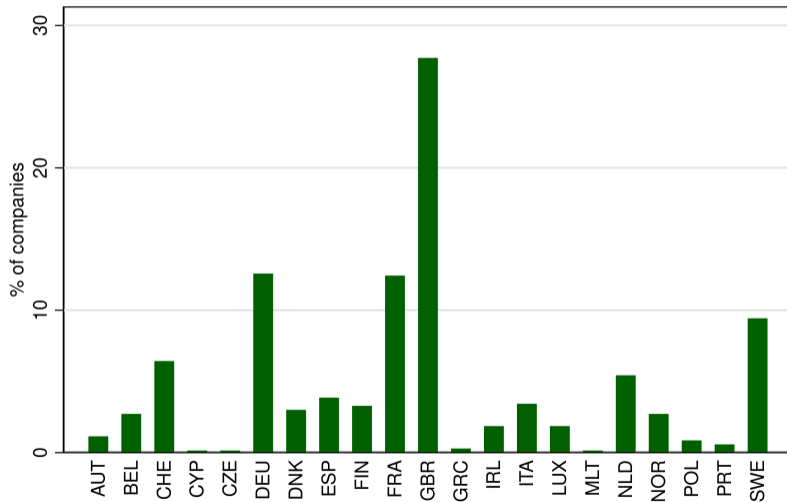
Interaction with ESG concerns

VARIABLES	PD 1	PD 3	PD 5	PD 10
ESG score	-0.031*** (0.005)	-0.070*** (0.005)	-0.101*** (0.005)	-0.172*** (0.005)
ESG score X ESG expos.	-0.030*** (0.004)	-0.030*** (0.005)	-0.027*** (0.005)	-0.021*** (0.004)
Leverage	0.186*** (0.008)	0.233*** (0.008)	0.229*** (0.008)	0.177*** (0.006)
ICR	-0.052*** (0.010)	-0.093*** (0.014)	-0.111*** (0.017)	-0.099*** (0.019)
Total assets	-0.066*** (0.004)	-0.102*** (0.005)	-0.117*** (0.005)	-0.127*** (0.005)
PPE/assets	-0.058*** (0.007)	-0.063*** (0.008)	-0.058*** (0.007)	-0.045*** (0.006)
Buy recomm.	-0.082*** (0.006)	-0.087*** (0.006)	-0.074*** (0.006)	-0.044*** (0.005)
EPS (fwd)	-0.067*** (0.004)	-0.087*** (0.005)	-0.090*** (0.005)	-0.079*** (0.004)
PE (fwd)	-0.008** (0.004)	-0.010* (0.005)	-0.011* (0.006)	-0.009 (0.006)
ROE (fwd)	-0.091*** (0.019)	-0.109*** (0.022)	-0.110*** (0.021)	-0.089*** (0.016)
Observations	34,758	34,758	34,758	34,758
R-squared	0.18	0.25	0.30	0.39

NFC distribution by sector



NFC distribution by country



Empirical distribution of firms' ESG scores

