Ciciretti, Dalò, and Dam (2023)

The Contributions of Betas Versus Characteristics to the ESG Premium

Junyong Kim

Journal of Empirical Finance Highlights

- Firms with high ESG scores exhibit lower expected returns
- ESG characteristics rather than ESG betas mainly drives the ESG premium
- ESG characteristics explain a larger amount of variation in expected returns
- Higher realized returns preceding lower expected returns bias the estimated premium
- A firm-level analysis and bias correction reconcile mixed findings in the literature

Abstract

- Firms that score high on environmental, social, and governance (ESG) indicators exhibit lower expected returns. This negative ESG premium might be driven by the lower risk associated with high ESG scores (betas), or it could signal investors' preferences for firms with high ESG scores (characteristics). We show that ESG as a characteristic mainly drives the premium. Specifically, a one standard deviation increase in the ESG characteristic is associated with a decrease in expected returns of 2.73% annually. In addition, the ESG characteristic explains a higher proportion of the cross-sectional variation in expected returns compared to ESG betas. We further caution for the presence of an ESG bias within the ESG premium that is due to positive *realized* returns preceding lower long-term expected returns. When correcting our estimates for the ESG bias the decrease in expected returns turns out to be 3.41% on an annual basis. The ESG bias correction, together with a firm-level methodology, can help clarify the mixed findings documented in the literature.

Contributions

- Our results add three insights to the literature on ESG investing
- As a first contribution, we corroborate the idea that there exists an ESG premium to be explained in the first place
- Second, we show that the negative ESG premium is driven mainly by investor preferences (characteristics) rather than risk (betas)
- As a final contribution, we show that when estimating the ESG premium one should correct for the ESG bias generated by positive realized returns resulting from sudden shifts in demand towards ESG assets that we have seen in recent years on financial markets
- As such, independently from the sign of the ESG premium previously reported by the literature, our results show that such estimates are conservative and that the reduction in expected returns may be even larger than previously thought

Table 2 Properties of decile portfolios sorted on ESG score Panel A

	[1]	[2]	[3]	[4]
	Panel A: Descriptives			
	$\bar{R}_p^e$	σ_p	ShR_p	$\overline{ESG}_p$
Worst	1.686	4.455	0.379	11.036
2	1.614	4.626	0.349	18.755
3	1.581	4.935	0.320	24.096
4	1.456	4.958	0.294	29.061
5	1.237	4.596	0.269	34.086
6	1.273	4.168	0.305	39.436
7	1.067	4.117	0.259	45.140
8	1.059	4.310	0.246	51.574
9	1.192	4.131	0.289	59.568
Best	0.975	4.207	0.232	72.069
Diff	−0.711**			
	(−1.657)			

$$\partial R^e / \partial ESG \times \sigma_{ESG} \times 12 = -0.012 \times 18.9 \times 12 \approx -2.7\%$$

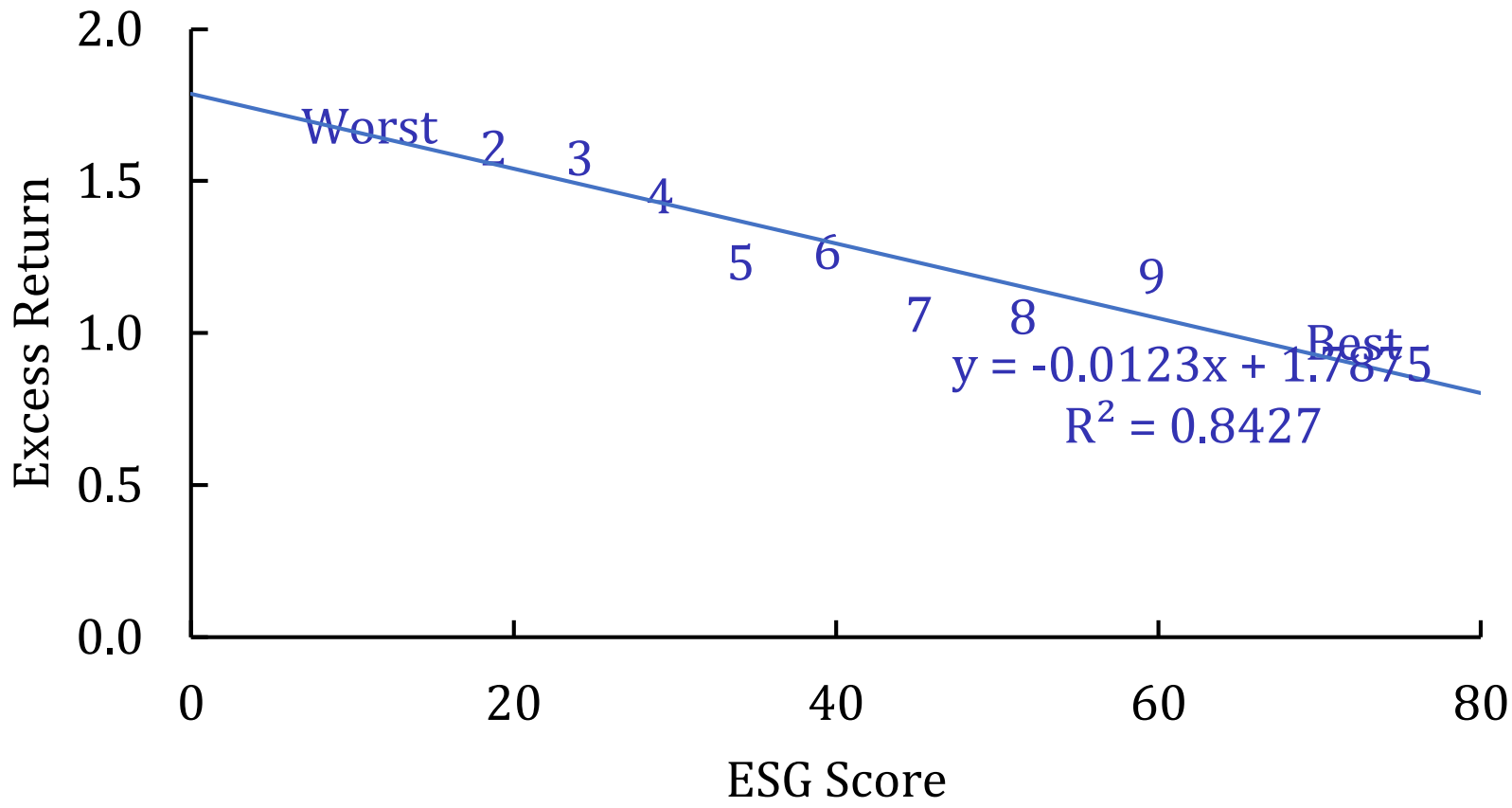

Table 2 Properties of decile portfolios sorted on ESG score Panel B

	Panel B: Multifactor time-series regression alphas and GRS test.			
	$2-Factor$	$4-Factor$	$6-Factor$	$7-Factor$
Worst	0.501***	0.449**	0.572***	0.571***
	(2.842)	(2.556)	(3.428)	(3.478)
2	0.337**	0.238	0.32**	0.319**
	(2.003)	(1.446)	(1.978)	(1.993)
3	0.259	0.171	0.268	0.267
	(1.345)	(0.899)	(1.442)	(1.473)
4	0.163	0.05	0.134	0.134
	(0.817)	(0.255)	(0.694)	(0.696)
5	0.021	−0.045	0.023	0.022
	(0.119)	(−0.252)	(0.129)	(0.125)
6	0.155	0.12	0.171	0.17
	(1.028)	(0.789)	(1.121)	(1.133)
7	−0.022	−0.057	−0.001	−0.003
	(−0.149)	(−0.386)	(−0.009)	(−0.018)
8	−0.054	−0.109	−0.061	−0.062
	(−0.352)	(−0.703)	(−0.39)	(−0.406)
9	0.11	0.069	0.147	0.146
	(0.765)	(0.477)	(1.047)	(1.056)
Best	−0.109	−0.161	−0.107	−0.108
	(−0.737)	(−1.09)	(−0.728)	(−0.745)
Diff	−0.61***	−0.61***	−0.679***	−0.679***
	(−4.677)	(−4.899)	(−5.617)	(−5.606)
GRS	[3.203]	[3.428]	[4.555]	[4.537]

Worst-Minus-Best: (0.57−(−0.11))×12 = 8.16%

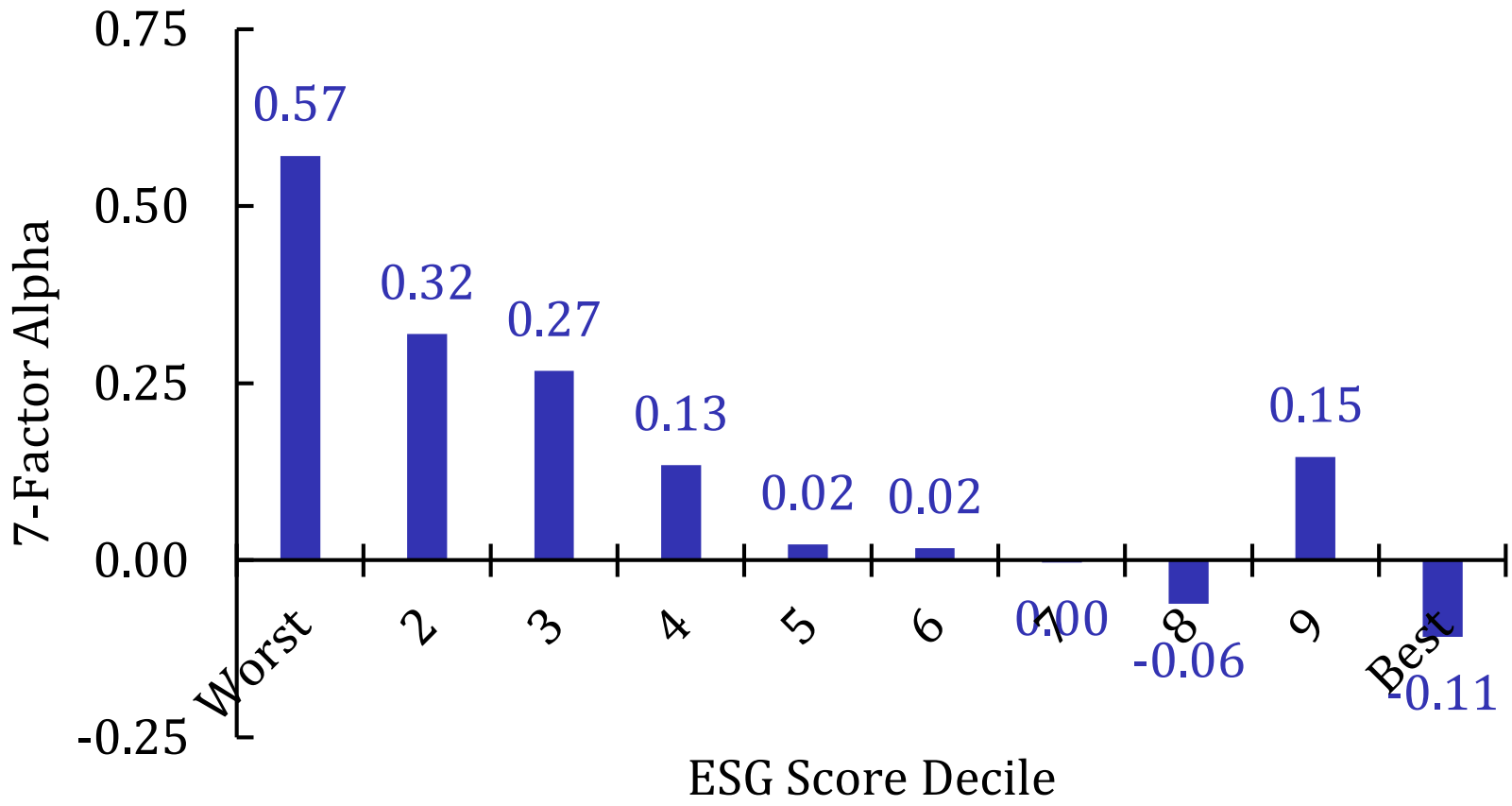

Table 3 Cross-sectional regressions

	[1] 5-factor	[2] 6-factor	[3] 6-factor	[4] 7-factor
Const.	−2.362	−3.004**	−3.122***	−3.477***
	(−1.535)	(−2.325)	(−2.83)	(−3.357)
lME	0.165**	0.234***	0.238***	0.255***
	(1.988)	(3.302)	(3.808)	(4.469)
lBtM	−1.129***	−1.266***	−1.198***	−1.203***
	(−13.352)	(−16.181)	(−16.153)	(−16.81)
Pro	0.602***	0.677***	0.684***	0.684***
	(3.697)	(4.061)	(4.24)	(4.381)
Inv	−0.508***	−0.573***	−0.52***	−0.513***
	(−5.697)	(−6.681)	(−6.113)	(−6.069)
lRet6	−0.344	−0.260	−0.386	−0.328
	(−0.672)	(−0.512)	(−0.94)	(−0.843)
ESG	−0.013***	−0.013***	−0.012***	−0.012***
	(−6.619)	(−7.278)	(−7.006)	(−6.46)
ρ_{mk}	0.223	−0.456	−0.394*	−0.341
	(1.568)	(−1.854)	(−1.968)	(−1.06)
$\hat{\beta}_s$		0.477**	0.508**	0.537**
		(2.276)	(2.404)	(2.59)
$\hat{\beta}_h$		0.386***	0.265**	0.256
		(3.033)	(2.24)	(1.642)
$\hat{\beta}_r$			−0.096	−0.052
			(−1.111)	(−0.431)
$\hat{\beta}_c$			0.050	0.068
			(0.613)	(0.822)
$\hat{\beta}_w$				−0.550*
				(−1.749)
$\hat{\beta}_{ESG}$	−0.189	−0.187	−0.076	0.060
	(−1.406)	(−0.91)	(−0.296)	(0.165)
$\bar{C}_{Zcs}$	104.269	105.100	107.471	105.450
$\bar{C}_{\hat{B}}$	4.000	30.095	23.328	32.182
$\bar{C}_{ESG}$	5.593	4.117	4.163	4.139
$\bar{C}_{\hat{\beta}_{ESG}}$	3.592	2.785	0.527	0.317

ESG_i characteristic is priced,
but $\beta_{ESG,i}$ risk is not priced

Table 4 Cross-sectional regressions using in-sample constructed risk factors

	[1] 1-factor	[2] 4-factor	[3] 5-factor	[4] 7-factor
Const.	−2.348	−2.676*	−3.115***	−3.112***
	(−1.676)	(−1.966)	(−2.713)	(−2.649)
lME	0.165*	0.223***	0.233***	0.241***
	(0.223)	(3.041)	(3.551)	(3.611)
lBtM	−1.129***	−1.173***	−1.192***	−1.20***
	(−1.173)	(−14.264)	(−15.449)	(−15.767)
Pro	0.599***	0.683***	0.683***	0.665***
	(0.683)	(4.421)	(4.484)	(4.362)
Inv	−0.509***	−0.549***	−0.526***	−0.537***
	(−0.549)	(−5.952)	(−5.981)	(−6.176)
lRet6	−0.34	−0.295	−0.155	−0.186
	−0.662	−0.607	−0.334	−0.399
ESG	−0.013***	−0.013***	−0.012***	−0.011***
	(−0.013)	(−7.289)	(−6.285)	(−6.56)
ρ_{mk}	0.236	−0.448	−0.217	−0.401
	(−0.448)	(−2.405)	(−1.022)	(−1.973)
$\hat{\beta}_s$		0.114	0.195**	0.045
		(0.631)	(1.986)	(0.214)
$\hat{\beta}_h$		0.544**	0.584***	0.89**
		(2.087)	(3.587)	(2.304)
$\hat{\beta}_r$			−0.32***	−0.663
			(−2.648)	(−1.466)
$\hat{\beta}_c$			−0.08	−0.32
			(−0.459)	(−1.202)
$\hat{\beta}_w$				−0.23
				(−0.904)
$\hat{\beta}_{ESG}$	−0.204	−0.242*	−0.147*	−0.26
	(−0.242)	(−1.831)	(−1.72)	(−1.225)
C_{Zcs}	104.570	105.796	107.342	76.257
$\bar{C}_{\hat{B}}$	4.518	25.071	35.427	70.547
$\bar{C}_{ESG}$	5.792	4.830	4.118	2.586
$\bar{C}_{\hat{\beta}_{ESG}}$	4.250	5.628	2.176	4.330

Consistent with Fama–French factors' in-sample versions: Characteristics priced, risk not

Debiasing Endogeneity via Campbell–Shiller

- $\mathrm{Cov}[N_{DRit}, Zsc_{it-1}] \neq 0 \Longrightarrow$ Estimated ESG premium $\tilde{\gamma}_2$ is biased

$$r_{it} = \underbrace{\gamma_0 + \gamma_1' B_{it-1} + \gamma_2' Zsc_{it-1}}_{E_{t-1}[r_{it}]} + \underbrace{N_{CFit} + N_{DRit}}_{\varepsilon_{it}}$$

$$= \gamma_0 + \gamma_1' B_{it-1} + \underbrace{(\gamma_2 - \theta_2)'}_{\tilde{\gamma}_2'} Zsc_{it-1} + \tilde{\varepsilon}_{it}$$

- $N_{DRit} = \theta_2' Zsc_{it-1} + \varepsilon_{DRit} \Longrightarrow$ dp regression below can estimate θ_2

$$N_{DRit} = \widetilde{dp}_{it} - E_{t-1}\left[\widetilde{dp}_{it}\right]$$

$$\Longrightarrow \widetilde{dp}_{it} - \theta_0 - \theta_1 \widetilde{dp}_{it-1} = \theta_2' Zsc_{it-1} + \nu_{it}$$

- Debias $\tilde{\gamma}_2$ via θ_2 as follows:

$$\gamma_2 = \tilde{\gamma}_2 + \theta_2$$

Table 5 Cross-sectional regressions for the dividend-price ratio

[1]	[2]	[3]	[4]	[5]
$\tilde{\gamma}_2$	θ_0	θ_1	θ_2	γ_2
−0.012	3.451***	3.605***	−0.003*	−0.015***
(−6.46)	(44.722)	(7.042)	(−1.674)	(−57.723)

The table reports the estimates of Eq. (9):

$$\widetilde{dp}_{i,t} = \theta_0 + \theta_1 \widetilde{dp}_{i,t-1} + \theta_2' Z sc_{i,t-1} + \upsilon_{i,t}$$

$\widetilde{dp}_{i,t}$ and $\widetilde{dp}_{i,t-1}$ represents the current and one-month lagged scaled dividend price ratio; $Z sc_{i,t-1}$ is a vector including the ESG characteristic only. $\tilde{\gamma}_2$ is the monthly biased ESG premium estimated in Table 3 via specification [4]of Eq. (2), and $\gamma_2 = \tilde{\gamma}_2 + \theta_2$ is the monthly unbiased ESG premium once the monthly biased ESG premium ($\tilde{\gamma}_2$) is corrected for the monthly ESG bias (θ_2). The coefficients are multiplied by 100 and t-statistics are in brackets. ***,** and * denote 1%, 5%, and 10% significance.

Are they from Fama–MacBeth standard errors?

Table 6 Cross-sectional regressions at area-specific level

	[1] Asia ex-Japan	[2] Europe	[3] Japan	[4] North America
Const	0.436	−5.207***	−5.078***	−4.042***
	(0.086)	(−4.784)	(−3.653)	(−3.82)
lME	0.169	0.37***	0.373***	0.276***
	(0.795)	(5.60)	(4.154)	(4.808)
lBtM	−1.668***	−1.089***	−1.546***	−1.195***
	(−9.287)	(−12.575)	(−11.914)	(−13.45)
Pro	0.38	0.791***	−0.015	0.948***
	(1.379)	(4.82)	(−0.047)	(6.136)
Inv	−0.812***	−0.491***	−1.016***	−0.535***
	(−3.241)	(−3.471)	(−2.641)	(−6.484)
lRet6	0.404	0.215	−1.112**	−0.622
	(0.541)	(0.478)	(−2.277)	(−1.329)
ESG	−0.03***	−0.009***	−0.009***	−0.009***
	(−2.727)	(−4.261)	(−3.759)	(−4.153)
ρ_{mk}	−1.734	−0.364	−0.118	−0.531*
	(−1.232)	(−1.023)	(−0.347)	(−1.717)
$\hat{\beta}_s$	1.134**	0.523***	0.554***	0.638***
	(2.562)	(2.791)	(2.967)	(4.651)
$\hat{\beta}_v$	1.748*	0.494***	0.69***	0.386**
	(1.883)	(3.174)	(4.334)	(2.563)
$\hat{\beta}_m$	−0.731***	−0.34***	−0.30***	−0.048
	(−2.793)	(−3.47)	(−2.827)	(−0.432)
$\hat{\beta}_c$	−0.626	0.055	0.207**	0.141
	(−0.727)	(0.629)	(2.029)	(1.40)
$\hat{\beta}_w$	−1.461*	−0.222	−0.845***	−0.643**
	(−1.901)	(−0.909)	(−4.353)	(−3.376)
$\hat{\beta}_{ESG}$	−0.134	−0.019	−0.186	−0.147
	(−0.673)	(−0.147)	(−1.055)	(−1.341)
$\bar{C}_{Zcs}$	58.555	120.801	133.453	109.909
$\bar{C}_{\hat{B}}$	59.255	23.422	48.116	28.660
$\bar{C}_{ESG}$	5.162	2.518	4.706	2.107
$\bar{C}_{\hat{\beta}_{ESG}}$	0.139	0.012	2.081	1.111

Consistent in every area:
Characteristics priced, risk not

Table 7 Cross-sectional regressions – VIGEO-EIRIS

	[1] 5-factor	[2] 6-factor	[3] 6-factor	[4] 7-factor
Const	−0.134	−0.021	−0.102	−0.143
	(−0.273)	(−0.047)	(−0.240)	(−0.342)
lME	0.488***	0.507***	0.524***	0.498***
	(7.140)	(7.162)	(7.673)	(7.604)
lBtM	−0.124	−0.112	−0.100	−0.101
	(−0.984)	(−0.950)	(−0.902)	(−0.954)
Inv	−0.374	−0.328	−0.254	−0.273
	(−1.310)	(−1.214)	(−0.947)	(−1.072)
Pro	−0.046	−0.040	−0.057	−0.054
	(−0.286)	(−0.272)	(−0.369)	(−0.346)
lRet6	−0.859	−0.528	−0.341	−0.270
	(−1.505)	(−1.060)	(−0.761)	(−0.598)
ESG	−0.024***	−0.024***	−0.022***	−0.023***
	(−4.053)	(−4.367)	(−4.083)	(−4.273)
ρ_{mk}	0.182	−0.046	−0.010	0.079
	(0.907)	(−0.165)	(−0.035)	(0.228)
$\hat{\beta}_s$		0.203	0.235	0.257*
		(1.198)	(1.523)	(1.720)
$\hat{\beta}_h$		0.061	0.084	0.087
		(0.399)	(0.551)	(0.615)
$\hat{\beta}_r$			−0.194**	−0.202**
			(−2.020)	(−2.127)
$\hat{\beta}_c$			0.019	0.061
			(0.172)	(0.560)
$\hat{\beta}_w$				−0.098
				(−0.359)
$\hat{\beta}_{ESG}$	−0.189	−0.220	−0.134	−0.185
	(−0.836)	(−1.143)	(−0.688)	(−0.958)
$\bar{C}_{Zcs}$	116.264	130.525	119.858	123.691
$\bar{C}_{\hat{B}}$	6.640	12.937	16.466	22.536
$\bar{C}_{ESG}$	24.708	25.440	19.278	23.090
$\bar{C}_{\hat{\beta}_{ESG}}$	4.487	6.556	2.167	4.648

Consistent with alternative ESG data:
Characteristics priced, risk not

Conclusion 1/2

- Using a global sample of firms for the period 2003 to 2020, and accounting for the EIV problem, we find evidence of a negative ESG premium
- In addition, ESG characteristics appear to be the only determinant of the ESG premium and not ESG risk factor betas
- Specifically, a one standard deviation increase in the ESG score is associated with a decrease in expected returns of about 2.73% annually

Conclusion 2/2

- We additionally postulate that sudden ESG-related demand increases may cause a bias in the baseline estimation
- Using Fama-MacBeth regressions of dividend-price ratios on ESG characteristics, the unbiased ESG premium turns out to be equal to 3.41% on an annual basis
- These results are consistent across four investment areas, the two ESG data sets, and robust to various specifications and different proxies for the risk factors