

Online Appendix for “Green Tilts”

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August 1, 2025

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B.1. Additional data details

The non-ESG stock characteristics, \mathcal{C} , are computed as follows. BE/ME is the book-to-market ratio. Book equity equals stockholder equity plus TXDITC (imputing zero if missing) minus BVPS, where stockholder equity equals SEQ if available, otherwise CEQ+PSTK, otherwise AT-LT. BVPS equals PSTKRV if available, otherwise PSTKL, PSTK, or zero. Profitability equals profits divided by end-of-year book equity, where profits equals revenues (REVT) minus COGS minus SG&A (XSGA, imputing zero if missing) minus interest expense (XINT, imputing zero if missing). Profitability is missing if book equity is negative. Investment is the year-over-year fraction change in book assets. These variable definitions follow Fama and French (2015). Dividends/BE is dividends (DVT) divided by end-of-year book equity, replacing DVT with zero if negative. All ratios are from the most recent fiscal year end, and we lag all ratios by six months so investors can observe them. Market cap, computed from CRSP, is observed one month before the beginning of the given time period. We estimate market betas from rolling stock-level time-series regressions of excess stock returns on excess market returns, using the past 60 months of data and requiring at least 24 months of data. Return[-11,-1] is the stock's return during the past 12 months, excluding the most recent one. Note that the most recent month is month zero, i.e., the current month, because holdings are measured at the end of the month.

B.2. Additional estimation details

B.2.1. Estimating the extensive-margin model

This subsection provides additional details supporting Section 3.1, in which we describe the estimation of π_{in} , the probability that investor i holds stock n . We estimate π_{in} from investor-specific probit models. The probit model is a type of regression commonly used to relate a 0/1 dependent variable, denoted Y here, to a vector X of explanatory variables. The probit model assumes

$$\Pr\{Y = 1|X\} = \Phi(X'a), \quad (\text{B.1})$$

where Φ is the cumulative distribution function for the standard normal distribution, and a is a vector of coefficients to be estimated.

We apply the probit model as follows. We set Y equal to $1_{w_{in}>0}$, the indicator for whether investor i holds stock n . Vector $X = X_n$ contains a constant and the characteristics of stock n . In our baseline setting, we use ten characteristics for each stock—three ESG characteristics and seven non-ESG characteristics, where the latter serve as control variables. Vector $a = a_i$ contains investor i 's probit coefficients, which describe how each stock characteristic relates to the likelihood that investor i holds a given stock. Using maximum likelihood, we estimate a separate probit model for each investor i , yielding a set of estimated coefficients $\{\hat{a}_i\}$. We then set the estimated probability $\hat{\pi}_{in}$ to $\Phi(X_n'\hat{a}_i)$. We repeat this analysis each quarter.

We find that the probit models fit the data quite well. In our baseline setting applied to data from financial institutions' 13F filings, the average pseudo- R^2 across the institutions' probit models is 0.357 (Section B.2.3). The ten chosen stock-level characteristics go a long way toward explaining which stocks each institution chooses to hold.

Logit is an alternative to probit for modeling 0/1 dependent variables. We choose probit over logit to be consistent with our intensive-margin model. That model includes a Heckman selection correction whose first step involves estimating a probit model with the same dependent variable, an indicator for whether investor i holds stock n (details in Section 3.3 and A.2). We find that our estimates of aggregate ESG tilts are very similar, indeed almost identical, if we switch from probit to logit in the extensive-margin model.

B.2.2. Heckman adjustment

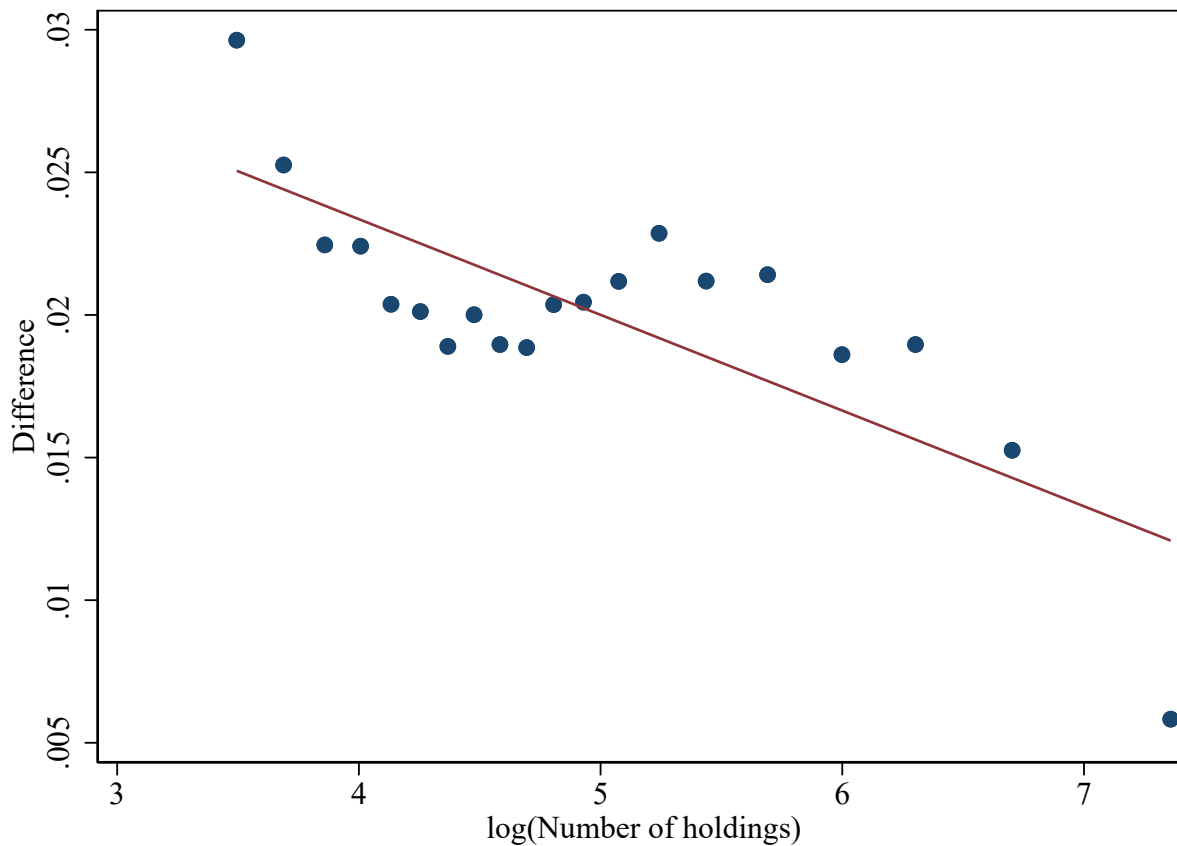


Figure B.1. The effect of the Heckman adjustment and its relation to number of holdings. This is a binscatter plot derived from 13F institutions' estimated tilts from all quarters. The horizontal axis shows the log number of covered stocks held by the institution. The vertical axis shows the absolute value of the difference between two estimates of T_i ; one estimate includes a Heckman adjustment and the other does not.

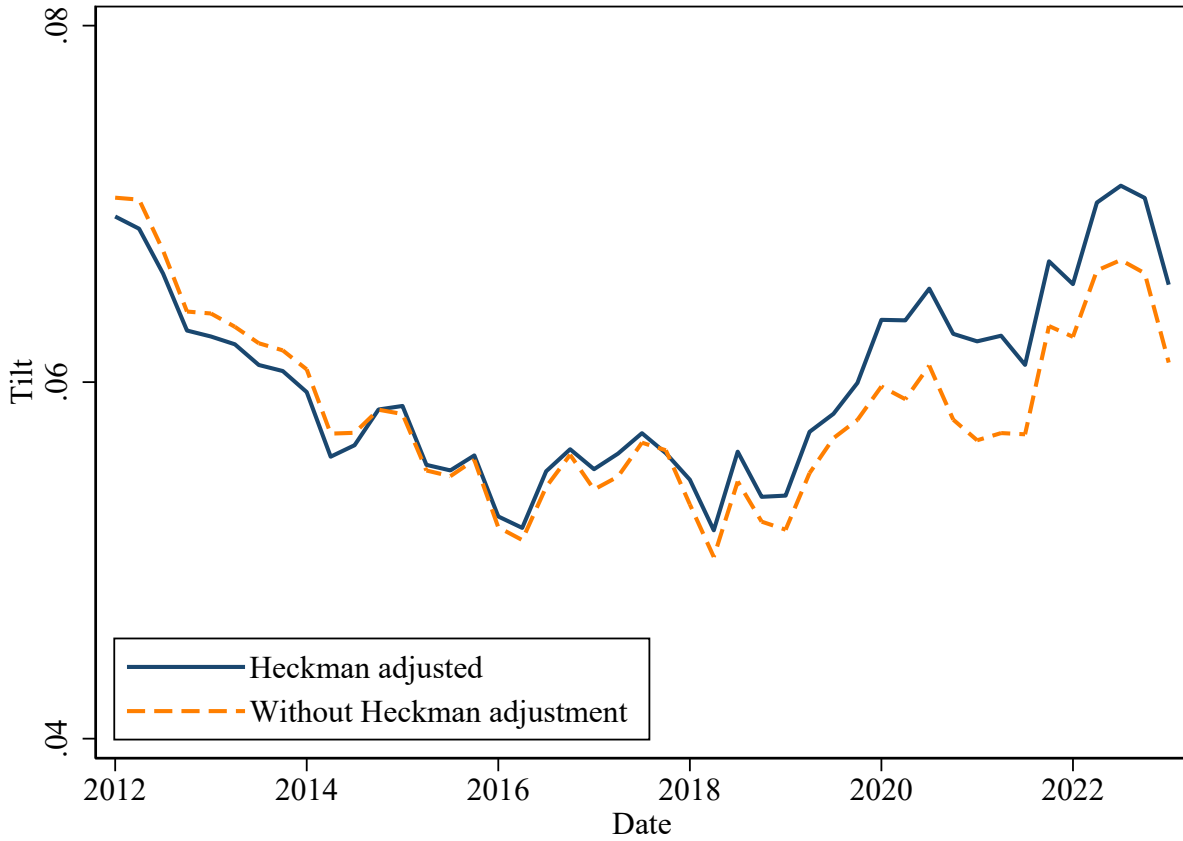


Figure B.2. Aggregate ESG tilts with and without Heckman adjustment. This figure presents the total ESG tilts, both with and without the Heckman adjustment. The Heckman-adjusted tilts are those shown in Figure 1.

B.2.3. Goodness of fit: Extensive and intensive models

Table B.1: Summary statistics on R^2 in the extensive and intensive models

Panel A presents summary statistics on institutions' pseudo R-squared values in the extensive model. Panel B similarly reports summary statistics on R-squared values in the intensive model. Results are from 13F institutions in 2023q4.

Mean	Stdev	p10	p25	Median	p75	p90
Panel A: Extensive model						
0.357	0.146	0.155	0.259	0.367	0.450	0.533
Panel B: Intensive model						
0.414	0.248	0.079	0.202	0.405	0.610	0.760

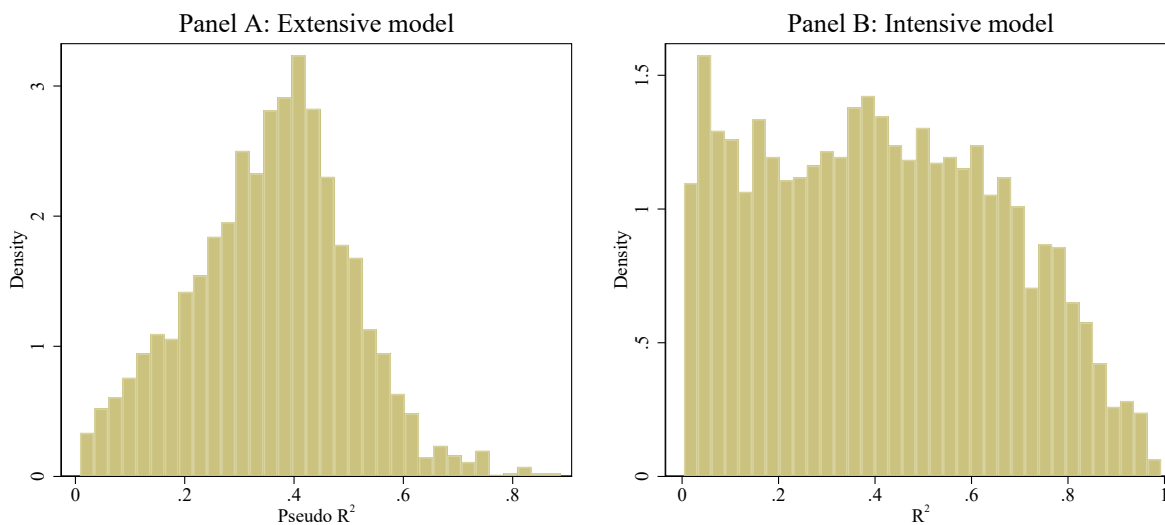


Figure B.3. Histogram of R-squared in extensive and intensive models. Panel A plots the histogram of institutions' pseudo R-squared values in the extensive model. Panel B similarly plots the histogram of R-squared values in the intensive model. Results are from 13F institutions in 2023q4.

B.2.4. Truncation of w_{in}^+

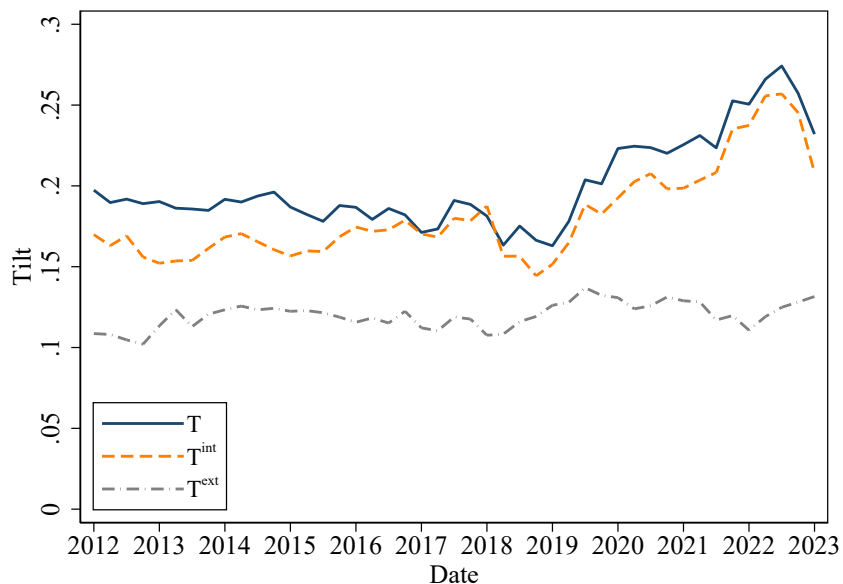
Table B.2: Which institutions or stocks exhibit more truncation?

This table presents results from a regression with dependent variable equal to an indicator for whether w_{in}^+ is truncated to be in $[0,1]$. The regression uses 5.8 million institution \times stock non-missing observations from 2023q4. Institution types are those used in Table 2, with 1(Insurance) the excluded category. Three AUM size categories are computed using AUM terciles, with the medium category excluded. We use stocks' Fama-French 12 industry classifications and exclude 1(Other). Robust t -statistics double-clustered by institution and stock are in parentheses.

Institution-level dummies:	
1(Inv. advisor)	-0.0051 (-0.48)
1(Bank)	-0.0205 (-1.82)
1(Pension/endowment)	-0.0404 (-3.61)
1(Large AUM)	0.0012 (0.32)
1(Small AUM)	0.0021 (0.54)
Stock-level dummies:	
1(NoDur)	0.0086 (0.65)
1(Durbl)	-0.0074 (-0.58)
1(Manuf)	-0.0154 (-2.25)
1(Enrgy)	0.0207 (1.57)
1(Chems)	-0.0079 (-0.86)
1(BusEq)	-0.0005 (-0.07)
1(Telcm)	0.0173 (0.91)
1(Utils)	0.0212 (1.84)
1(Shps)	-0.0155 (-2.00)
1(Hlth)	-0.0119 (-1.87)
1(Money)	-0.0075 (-1.13)
R^2	0.003

B.3. Additional results on 13F institutions' tilts, without industry adjustment

Panel A: Institutions holding a below-median number of stocks



Panel B: Institutions holding an above-median number of stocks

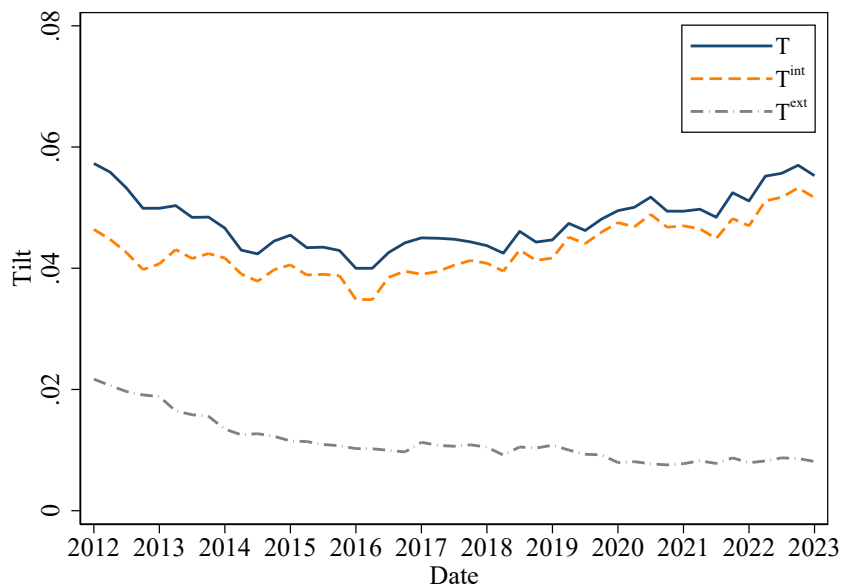


Figure B.4. ESG-related tilts in subsamples based on number of stocks held. Tilts in this figure are the same as in the paper's Figure 1 Panel A, except we show tilts aggregated within two subsamples. In each quarter, we calculate the median number of stocks held across institutions, and we split the institutions in two groups based on whether their number of stocks held is below the median (Panel A) or at or above the median (Panel B). The median number of holdings ranges from 104 to 121 across quarters.

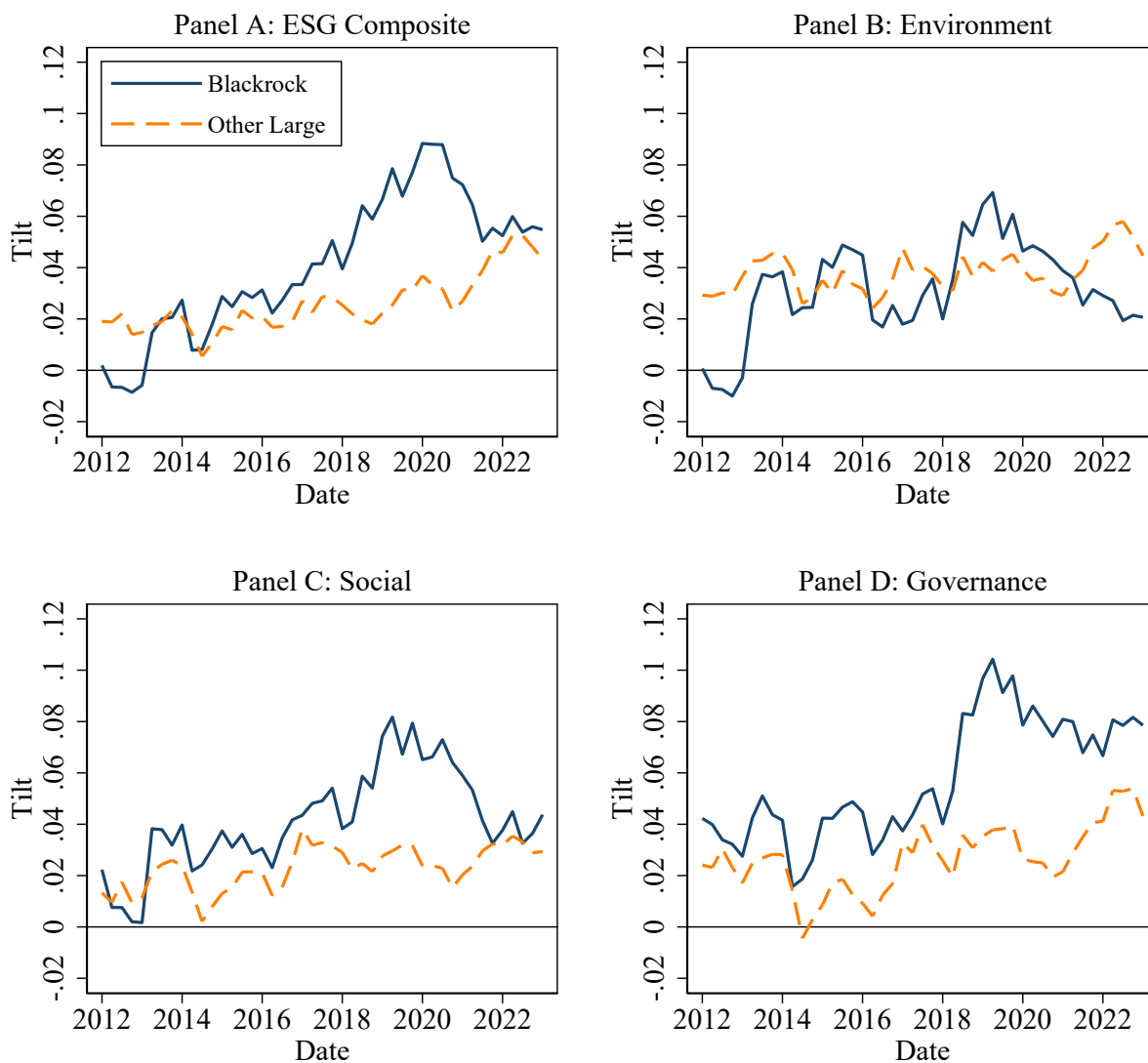


Figure B.5. GMB tilts of BlackRock and other large institutions. This figure compares BlackRock’s GMB tilt to the AUM-weighted average GMB tilt of other large institutions. The lines labeled “Large” in Figure 6 are AUM-weighted averages of the two lines in each panel of this figure.

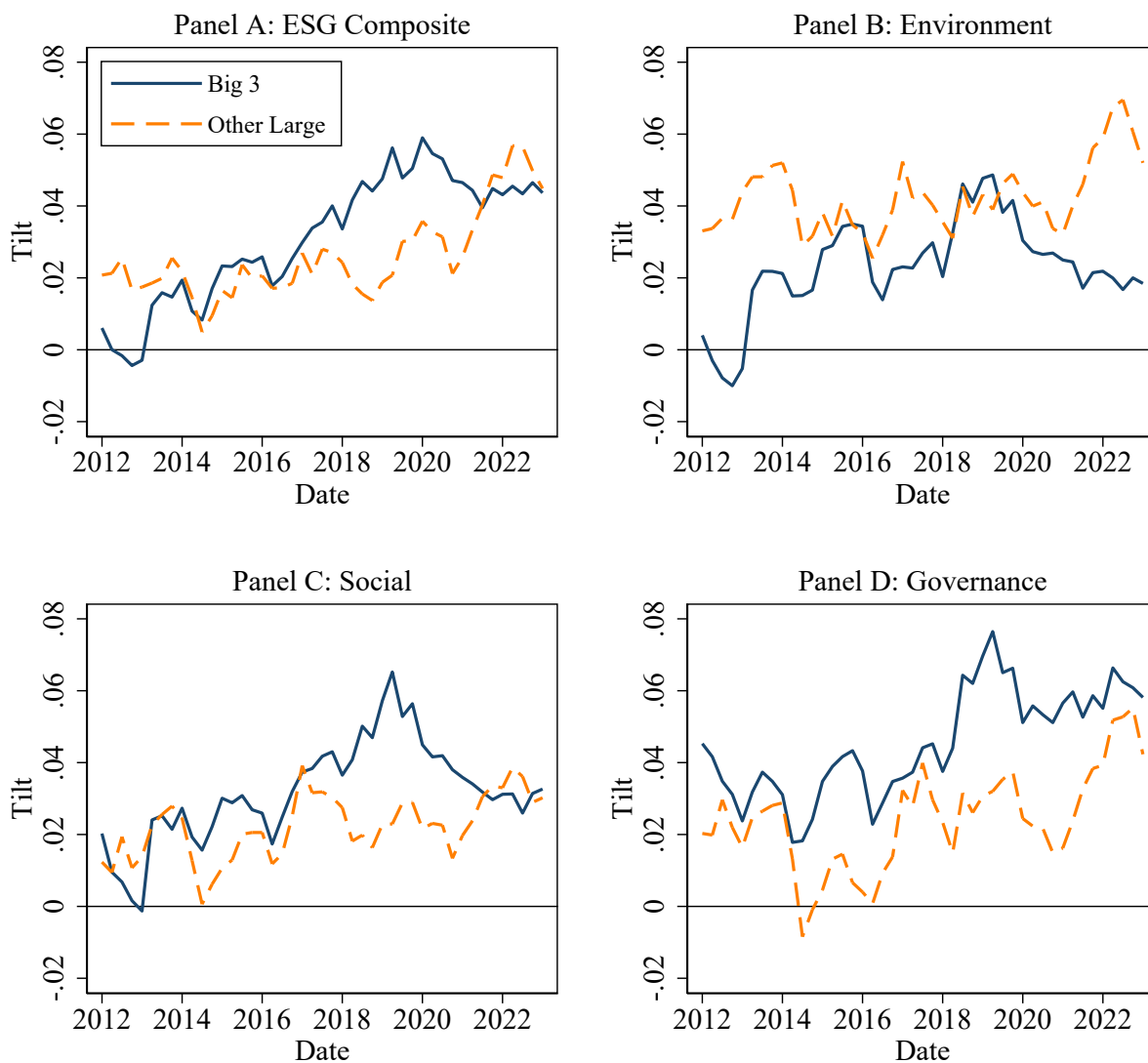


Figure B.6. GMB tilts of the Big Three and other large institutions. This figure compares GMB tilts between the subsample of Big Three institutions and other large institutions. Each line shows the AUM-weighted average of GMB tilt within the given subsample of institutions. The lines labeled “Large” in Figure 6 of the paper are AUM-weighted averages of the two lines in each panel of this figure.

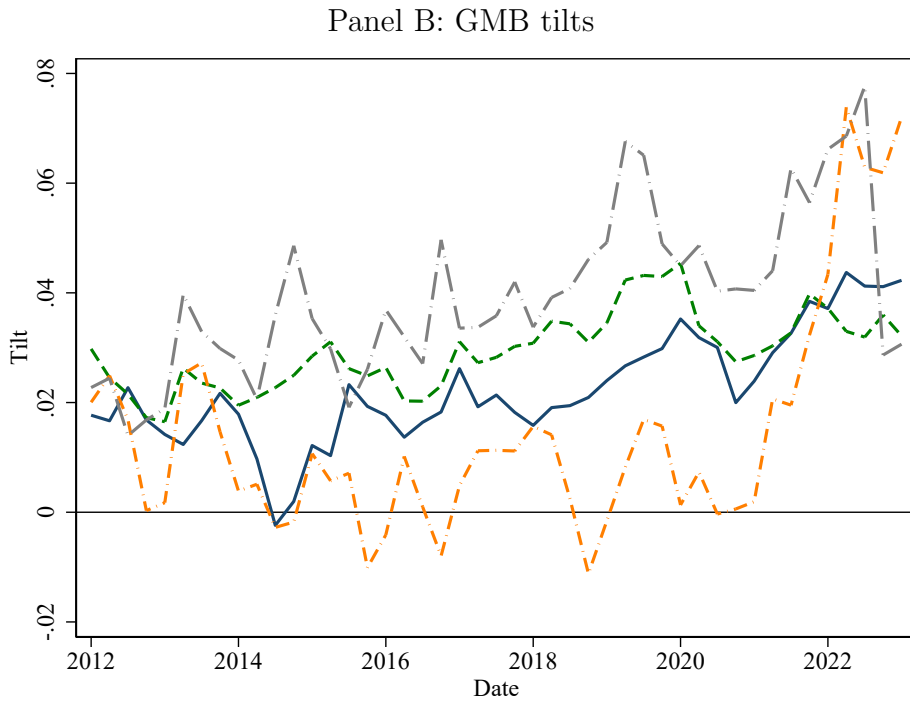
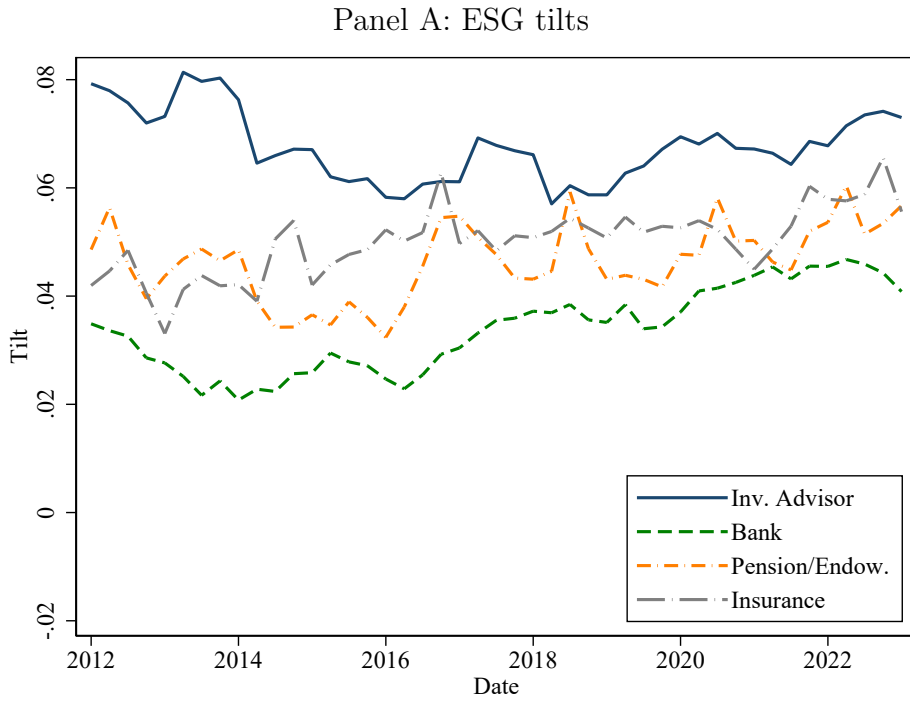


Figure B.7. Comparing tilts across institution types. Panel A (B) plots the AUM-weighted average of T_i (T_i^{GMB}). GMB tilts are computed using the ESG composite score to measure greenness.

Table B.3: Version of paper's Table 2 with time and institution fixed effects

This table shows results from panel regressions with dependent variable equal to GMB tilt and both time and institution fixed effects. Including these fixed effects requires dropping Trend, institution-type indicators, and indicators for geographical location from the regression. Remaining details are the same as in Table 2.

	ESG	Env.	Soc.	Gov.
log(AUM)	0.0075 (1.29)	-0.0158 (-2.24)	0.0103 (1.43)	-0.0018 (-0.29)
log(AUM) x trend	0.0688 (6.27)	0.0409 (3.44)	0.0509 (4.12)	0.0090 (0.84)
Active share	-0.0110 (-0.26)	-0.0551 (-1.07)	0.0352 (0.68)	-0.0428 (-0.99)
1(UNPRI)	0.0249 (1.67)	0.0454 (2.60)	0.0174 (1.11)	-0.0042 (-0.29)
R^2	0.439	0.448	0.499	0.409
R^2 (FEs only)	0.436	0.447	0.498	0.409

Table B.4: Version of paper's Table 3 with time fixed effects

This table is the same as Table 3 but includes time fixed effects, which requires dropping Trend from the regression.

	Green Tilts				Brown Tilts			
	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.
log(AUM)	0.0036 (2.56)	-0.0015 (-0.75)	0.0043 (2.46)	0.0038 (3.04)	-0.0195 (-11.05)	-0.0071 (-4.40)	-0.0208 (-9.68)	-0.0156 (-8.75)
log(AUM) \times trend	0.0288 (5.33)	0.0310 (4.23)	0.0188 (2.98)	0.0028 (0.61)	-0.0516 (-8.93)	-0.0178 (-3.04)	-0.0363 (-5.32)	-0.0071 (-1.12)
Active share	0.0900 (9.95)	0.1440 (11.04)	0.1284 (11.38)	0.0949 (10.53)	0.0916 (8.50)	0.1553 (13.34)	0.1153 (7.82)	0.1408 (11.29)
1(UNPRI)	0.0223 (3.63)	0.0215 (2.82)	0.0117 (1.73)	0.0020 (0.43)	-0.0230 (-4.22)	-0.0223 (-4.19)	-0.0351 (-5.48)	-0.0159 (-2.79)
1(Inv. advisor)	-0.0030 (-0.33)	0.0064 (0.43)	0.0048 (0.48)	-0.0165 (-1.60)	0.0216 (2.81)	0.0044 (0.52)	0.0106 (0.60)	0.0048 (0.31)
1(Bank)	-0.0172 (-1.73)	-0.0121 (-0.77)	-0.0304 (-2.71)	-0.0299 (-2.60)	0.0685 (5.17)	0.0170 (1.56)	0.1096 (4.45)	0.0324 (1.78)
1(Pension/endowment)	-0.0055 (-0.57)	-0.0077 (-0.47)	0.0104 (0.86)	-0.0053 (-0.44)	0.0074 (0.74)	0.0057 (0.47)	-0.0106 (-0.57)	-0.0112 (-0.64)
1(Europe)	0.0279 (2.93)	0.0393 (3.59)	0.0284 (2.64)	0.0270 (3.55)	-0.0070 (-0.94)	-0.0117 (-1.49)	-0.0237 (-2.74)	-0.0116 (-1.45)
1(Rest of world)	0.0107 (1.20)	0.0267 (2.27)	0.0158 (1.46)	0.0139 (1.57)	-0.0011 (-0.13)	-0.0129 (-1.48)	-0.0076 (-0.70)	0.0011 (0.10)
R^2	0.021	0.026	0.025	0.016	0.044	0.032	0.044	0.042
R^2 (FEs only)	0.004	0.002	0.002	0.002	0.016	0.002	0.007	0.004
p (Inst. types equal)	0.081	0.060	0.000	0.012	0.000	0.392	0.000	0.014

Table B.5: Version of paper's Table 3 with institution and time fixed effects

This table is the same as Table 3 but includes institution and time fixed effects, which requires dropping Trend, institution-type indicators, and indicators for geographical location from the regression.

	Green Tilts				Brown Tilts			
	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.
log(AUM)	-0.0013 (-0.42)	-0.0113 (-2.56)	0.0029 (0.74)	-0.0017 (-0.54)	-0.0110 (-3.05)	0.0029 (0.81)	-0.0109 (-2.42)	-0.0008 (-0.21)
log(AUM) \times trend	0.0216 (3.64)	0.0288 (3.81)	0.0169 (2.49)	0.0030 (0.57)	-0.0497 (-7.57)	-0.0136 (-2.16)	-0.0363 (-4.88)	-0.0057 (-0.84)
Active share	0.1045 (4.65)	0.1157 (3.81)	0.1472 (5.37)	0.0905 (4.14)	0.1124 (4.02)	0.1610 (5.61)	0.1034 (3.10)	0.1240 (4.42)
1(UNPRI)	0.0126 (1.42)	0.0247 (2.05)	-0.0005 (-0.05)	-0.0014 (-0.19)	-0.0125 (-1.45)	-0.0204 (-2.30)	-0.0175 (-1.94)	0.0028 (0.29)
R^2	0.378	0.435	0.427	0.342	0.441	0.434	0.504	0.421
R^2 (FEs only)	0.38	0.435	0.427	0.346	0.441	0.434	0.507	0.423

Table B.6
Additional details on aggregate tilts

Panel A: T

Year	Bias-Adj. Estimate	Standard Error	95% CI		Bias
			Low	High	
2012	0.069	0.002	0.066	0.073	0.010
2013	0.063	0.002	0.059	0.066	0.011
2014	0.059	0.002	0.056	0.063	0.011
2015	0.059	0.002	0.055	0.062	0.010
2016	0.052	0.002	0.049	0.056	0.010
2017	0.055	0.002	0.052	0.059	0.009
2018	0.055	0.002	0.051	0.058	0.008
2019	0.054	0.002	0.050	0.057	0.009
2020	0.063	0.002	0.060	0.067	0.002
2021	0.062	0.001	0.059	0.065	0.002
2022	0.065	0.002	0.062	0.069	0.002
2023	0.065	0.001	0.063	0.068	0.001

Panel B: T^{int}

Year	Bias-Adj. Estimate	Standard Error	95% CI		Bias
			Low	High	
2012	0.057	0.002	0.054	0.060	0.010
2013	0.051	0.002	0.048	0.054	0.011
2014	0.053	0.002	0.050	0.056	0.010
2015	0.051	0.002	0.048	0.054	0.009
2016	0.047	0.002	0.044	0.050	0.009
2017	0.050	0.002	0.046	0.053	0.008
2018	0.052	0.002	0.049	0.055	0.006
2019	0.050	0.001	0.047	0.053	0.007
2020	0.059	0.002	0.056	0.062	0.001
2021	0.058	0.001	0.056	0.061	0.001
2022	0.061	0.002	0.057	0.064	0.002
2023	0.061	0.001	0.058	0.063	0.000

Panel C: T^{ext}

Year	Bias-Adj. Estimate	Standard Error	95% CI		Bias
			Low	High	
2012	0.029	0.001	0.027	0.031	0.005
2013	0.027	0.001	0.026	0.029	0.005
2014	0.023	0.001	0.021	0.025	0.005
2015	0.022	0.001	0.020	0.024	0.004
2016	0.019	0.001	0.018	0.021	0.004
2017	0.019	0.001	0.017	0.021	0.004
2018	0.018	0.001	0.016	0.020	0.004
2019	0.020	0.001	0.018	0.021	0.004
2020	0.018	0.001	0.016	0.020	0.003
2021	0.017	0.001	0.015	0.018	0.003
2022	0.015	0.001	0.014	0.017	0.003
2023	0.015	0.000	0.014	0.016	0.002

B.4. Additional results on 13F institutions' industry-adjusted tilts

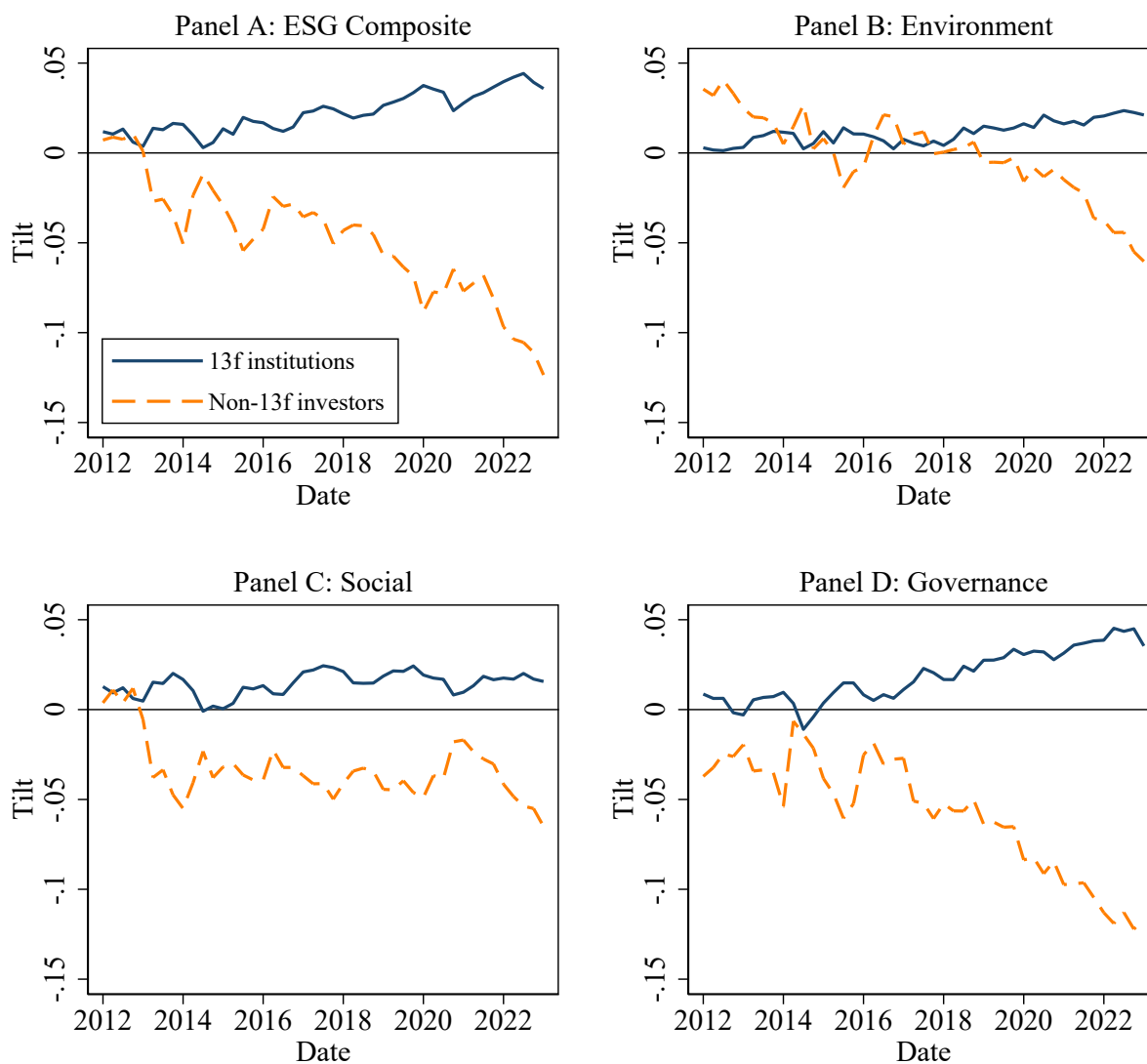


Figure B.8. Industry-adjusted GMB tilts of 13F filers and non-filers. This figure plots the same quantities as in Figure 4 but uses industry-adjusted ESG scores. Additional details are in Figure 7.

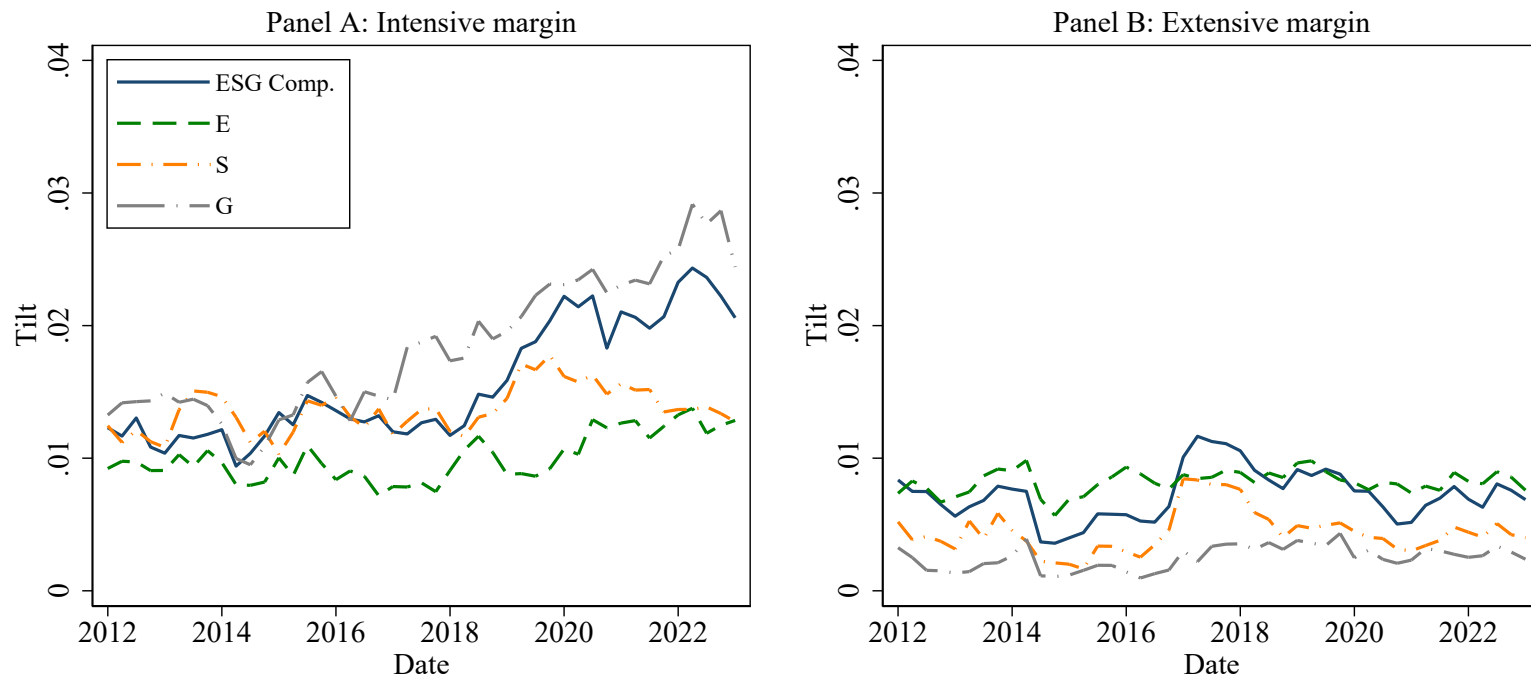


Figure B.9. Divestment from brown stocks, with industry adjustment. This figure plots the same quantities as in Figure 5 but uses industry-adjusted ESG scores. Additional details are in Figure 7.

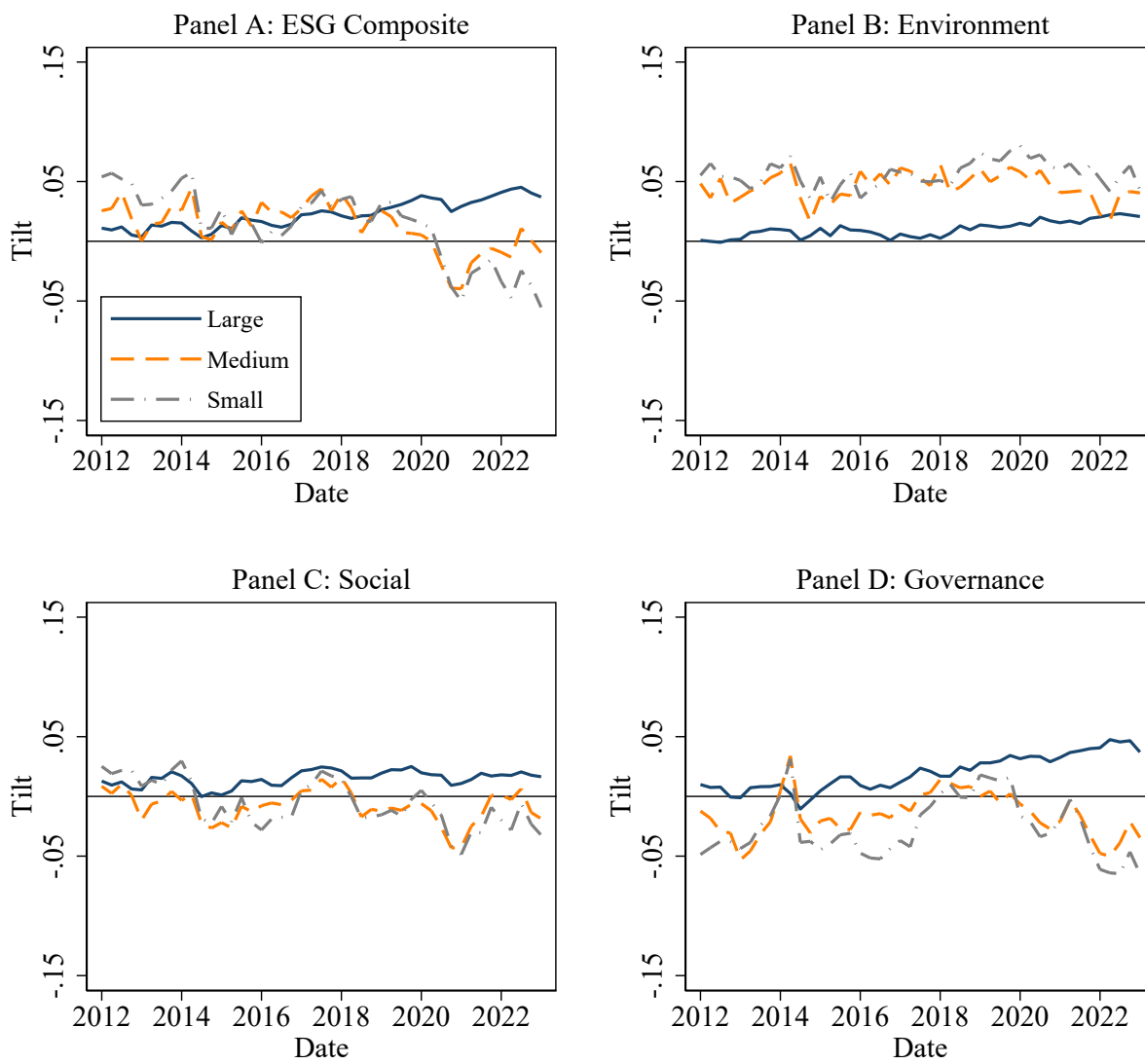


Figure B.10. Institution size and greenness, with industry adjustments. This figure plots the same quantities as Figure 6 but uses industry-adjusted ESG scores. Additional details are in Figure 7.

Table B.7
Aggregate industry-adjusted tilts

This table shows the same quantities as in Table 1 but uses industry-adjusted ESG scores. Additional details are in Figure 7.

Year	Estimated Tilt			Standard Error		
	Total	Intensive	Extensive	Total	Intensive	Extensive
2012	0.047	0.039	0.017	0.002	0.001	0.001
2013	0.051	0.043	0.017	0.002	0.002	0.001
2014	0.047	0.040	0.015	0.001	0.001	0.001
2015	0.042	0.036	0.013	0.001	0.001	0.001
2016	0.043	0.040	0.013	0.001	0.001	0.001
2017	0.046	0.039	0.014	0.002	0.002	0.001
2018	0.050	0.045	0.014	0.002	0.002	0.001
2019	0.047	0.043	0.012	0.002	0.001	0.001
2020	0.050	0.048	0.011	0.001	0.002	0.001
2021	0.054	0.051	0.011	0.001	0.001	0.001
2022	0.051	0.049	0.011	0.001	0.001	0.001
2023	0.051	0.047	0.010	0.001	0.001	0.000

**Table B.8: Which institutions are greener?
Version with industry-adjusted ESG scores**

This table shows the same quantities as in Table 2 but uses industry-adjusted ESG scores. Additional details are in Figure 7.

	No Fixed Effects				Time Fixed Effects				Institution Fixed Effects			
	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.
log(AUM)	0.0099 (4.40)	-0.0078 (-3.43)	0.0059 (2.74)	0.0093 (4.23)	0.0087 (3.87)	-0.0079 (-3.50)	0.0054 (2.49)	0.0078 (3.53)	-0.0042 (-0.77)	-0.0195 (-3.68)	0.0005 (0.09)	-0.0034 (-0.69)
log(AUM) × trend	0.0553 (6.55)	0.0133 (1.71)	0.0217 (2.75)	0.0226 (2.90)	0.0502 (5.96)	0.0119 (1.54)	0.0198 (2.50)	0.0145 (1.85)	0.0452 (4.73)	0.0122 (1.38)	0.0236 (2.65)	0.0190 (2.14)
Trend	0.4693 (5.51)	0.1238 (1.59)	0.1676 (2.10)	0.2531 (3.19)					0.3707 (4.03)	0.0899 (1.05)	0.2023 (2.36)	0.2357 (2.75)
Active share	-0.0258 (-1.78)	-0.0288 (-2.08)	-0.0246 (-1.75)	-0.0321 (-2.18)	-0.0246 (-1.69)	-0.0276 (-1.98)	-0.0244 (-1.73)	-0.0294 (-1.99)	-0.0373 (-0.99)	-0.0942 (-2.43)	0.0193 (0.56)	-0.0118 (-0.34)
1(UNPRI)	0.0315 (3.85)	0.0143 (1.77)	0.0230 (3.09)	0.0178 (2.43)	0.0325 (3.98)	0.0143 (1.76)	0.0235 (3.17)	0.0186 (2.55)	0.0225 (1.80)	0.0194 (1.51)	0.0066 (0.53)	-0.0034 (-0.28)
1(Inv. advisor)	-0.0239 (-1.62)	-0.0073 (-0.45)	-0.0039 (-0.29)	-0.0135 (-0.69)	-0.0243 (-1.65)	-0.0074 (-0.46)	-0.0041 (-0.31)	-0.0140 (-0.71)				
1(Bank)	-0.0287 (-1.55)	-0.0247 (-1.41)	-0.0477 (-2.79)	0.0267 (1.18)	-0.0290 (-1.57)	-0.0247 (-1.41)	-0.0480 (-2.81)	0.0266 (1.17)				
1(Pension/endowment)	-0.0217 (-1.33)	-0.0231 (-1.32)	-0.0044 (-0.30)	-0.0024 (-0.11)	-0.0216 (-1.32)	-0.0229 (-1.31)	-0.0044 (-0.29)	-0.0021 (-0.10)				
1(Europe)	0.0146 (1.26)	0.0301 (2.55)	0.0032 (0.30)	-0.0002 (-0.02)	0.0139 (1.19)	0.0298 (2.52)	0.0030 (0.28)	-0.0014 (-0.14)				
1(Rest of world)	-0.0073 (-0.60)	0.0156 (1.30)	-0.0177 (-1.44)	-0.0336 (-2.63)	-0.0081 (-0.67)	0.0155 (1.28)	-0.0178 (-1.46)	-0.0349 (-2.72)				
R^2	0.006	0.005	0.004	0.006	0.009	0.006	0.006	0.010	0.406	0.418	0.411	0.374
R^2 (FEs only)	N/A	N/A	N/A	N/A	0.005	0.001	0.003	0.004	0.403	0.417	0.410	0.374
p (Inst. types equal)	0.400	0.102	0.003	0.022	0.384	0.109	0.003	0.020	N/A	N/A	N/A	N/A

Table B.9: Green and brown tilts
Version with industry-adjusted ESG scores

This table shows the same quantities as in Table 3 but uses industry-adjusted ESG scores. Additional details are in Figure 7.

	Green Tilts				Brown Tilts			
	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.
log(AUM)	-0.0012 (-0.98)	-0.0109 (-7.43)	-0.0036 (-3.07)	0.0003 (0.29)	-0.0111 (-7.89)	-0.0031 (-2.60)	-0.0095 (-7.01)	-0.0089 (-6.49)
log(AUM) × trend	0.0292 (5.93)	0.0066 (1.34)	0.0068 (1.51)	0.0189 (4.64)	-0.0260 (-5.36)	-0.0067 (-1.59)	-0.0148 (-3.17)	-0.0038 (-0.76)
Trend	0.2900 (5.83)	0.1089 (2.18)	0.0867 (1.89)	0.2135 (5.15)	-0.1793 (-3.67)	-0.0150 (-0.35)	-0.0809 (-1.71)	-0.0395 (-0.79)
Active share	0.0702 (8.51)	0.0807 (8.96)	0.0674 (9.09)	0.0680 (8.55)	0.0961 (10.66)	0.1096 (15.19)	0.0920 (10.30)	0.1001 (10.90)
1(UNPRI)	0.0146 (2.79)	0.0063 (1.18)	0.0053 (1.18)	0.0058 (1.43)	-0.0169 (-3.79)	-0.0080 (-1.98)	-0.0177 (-4.18)	-0.0120 (-2.63)
1(Inv. advisor)	-0.0086 (-0.88)	-0.0025 (-0.21)	0.0039 (0.48)	-0.0126 (-1.08)	0.0153 (2.02)	0.0047 (0.75)	0.0078 (1.04)	0.0009 (0.09)
1(Bank)	0.0025 (0.22)	-0.0137 (-1.09)	-0.0152 (-1.69)	0.0253 (1.83)	0.0312 (2.90)	0.0110 (1.46)	0.0326 (2.98)	-0.0014 (-0.11)
1(Pension/endowment)	-0.0157 (-1.48)	-0.0147 (-1.15)	-0.0067 (-0.74)	-0.0139 (-1.17)	0.0060 (0.67)	0.0084 (1.11)	-0.0022 (-0.25)	-0.0115 (-0.95)
1(Europe)	0.0096 (1.21)	0.0239 (2.99)	-0.0014 (-0.22)	0.0002 (0.04)	-0.0050 (-0.85)	-0.0063 (-1.07)	-0.0045 (-0.74)	0.0004 (0.07)
1(Rest of world)	-0.0073 (-1.05)	0.0067 (0.82)	-0.0101 (-1.68)	-0.0227 (-3.94)	0.0000 (0.01)	-0.0089 (-1.50)	0.0076 (0.95)	0.0110 (1.25)
R^2	0.016	0.031	0.016	0.014	0.028	0.025	0.026	0.027
p (Inst. types equal)	0.110	0.078	0.001	0.000	0.010	0.441	0.003	0.391

B.5. Results using Sustainalytics scores

B.5.1. Data and summary statistics

Similar to MSCI, Sustainalytics measures ESG risk performance at the company level. In 2018, Sustainalytics made a major change to its ESG ratings methodology. Prior to this shift, the data reflected aggregated ESG performance scores based on the underlying E, S, and G pillars, with scores ranging from 0 to 100, where higher scores indicated stronger ESG performance. In contrast, the updated ESG Risk Ratings introduced in 2018 measure ESG risk aggregating scores from material ESG issues, with higher scores (also from 0 to 100) signifying greater risk, which is considered negative. WRDS has recently removed the legacy Sustainalytics data and now encourages users to fully transition to the updated ESG Risk Ratings.²⁷ We begin our Sustainalytics analysis in 2018 so that we use the updated methodology and avoid mixing methodologies.

Sustainalytics calculates its ESG Risk Score by summing the ESG Risk Score across Material ESG Issues (MEIs). For each MEI, the ESG Risk Score is further divided into an Exposure Score (ES) and a Managed Risk Score (MRS). Formally, for each firm i and each pillar $n \in \{E, S, G\}$, Sustainalytics defines the firm's Exposure and Managed Risk Scores on the pillar as

$$ES_{i,n,t} = \sum_{j \in S} \omega_{j,n,t} MEI_ES_{i,j,t} \quad (\text{B.2})$$

$$MRS_{i,n,t} = \sum_{j \in S} \omega_{j,n,t} MEI_MRS_{i,j,t}, \quad (\text{B.3})$$

where $S = \{MEI_1, MEI_2, \dots, MEI_j, \dots, MEI_{55}\}$ and $\omega_{j,n,t}$ is MEI j 's weight in the risk score at time t for pillar n .²⁸ Then, the firm's E, S, G, and overall ESG Risk Score are defined as

$$ER_{i,n,t} = ES_{i,n,t} - MRS_{i,n,t} \quad (\text{B.4})$$

$$ER_{i,t} = \sum_{n \in \{E, S, G\}} (ES_{i,n,t} - MRS_{i,n,t}). \quad (\text{B.5})$$

There is a parallel between the MSCI and Sustainalytics scores: just as the E, S, and G measures we use from MSCI sum to WAKI (plus a constant), the E, S, and G measures we use from Sustainalytics sum to $ER_{i,t}$. Similar to MSCI's data, $ER_{i,t}$ is explicitly not industry

²⁷As described by WRDS, "the legacy Sustainalytics measures ESG performance rather than ESG risk. In 2018, Sustainalytics decided to retire the legacy method and database as they launched a new product, Sustainalytics ESG Risk Ratings. Therefore, ESG Risk Ratings cannot be an extension of the legacy Sustainalytics."

²⁸Note that a single MEI can be tied to multiple ESG pillars. Sustainalytics applies two layers of weighting: 1) MEI weights that determine the contribution of each MEI to the overall risk score, and 2) E, S, and G weights allocated within each MEI. We combine these two weight structures into a single weight $\omega_{j,n,t}$.

adjusted. We multiply the Sustainalytics ratings by -1 to align with MSCI's scoring, such that higher scores reflect a greener firm. We calculate the cross-sectional percentile for each variable in Sustainalytics, as we do with the MSCI scores.

We obtain from WRDS the Sustainalytics overall ESG Risk Score ($ER_{i,t}$) and E, S, and G cluster score ($ER_{i,n,t}$), starting from December 2018. The cluster scores are often missing, even when the overall ESG score is non-missing.

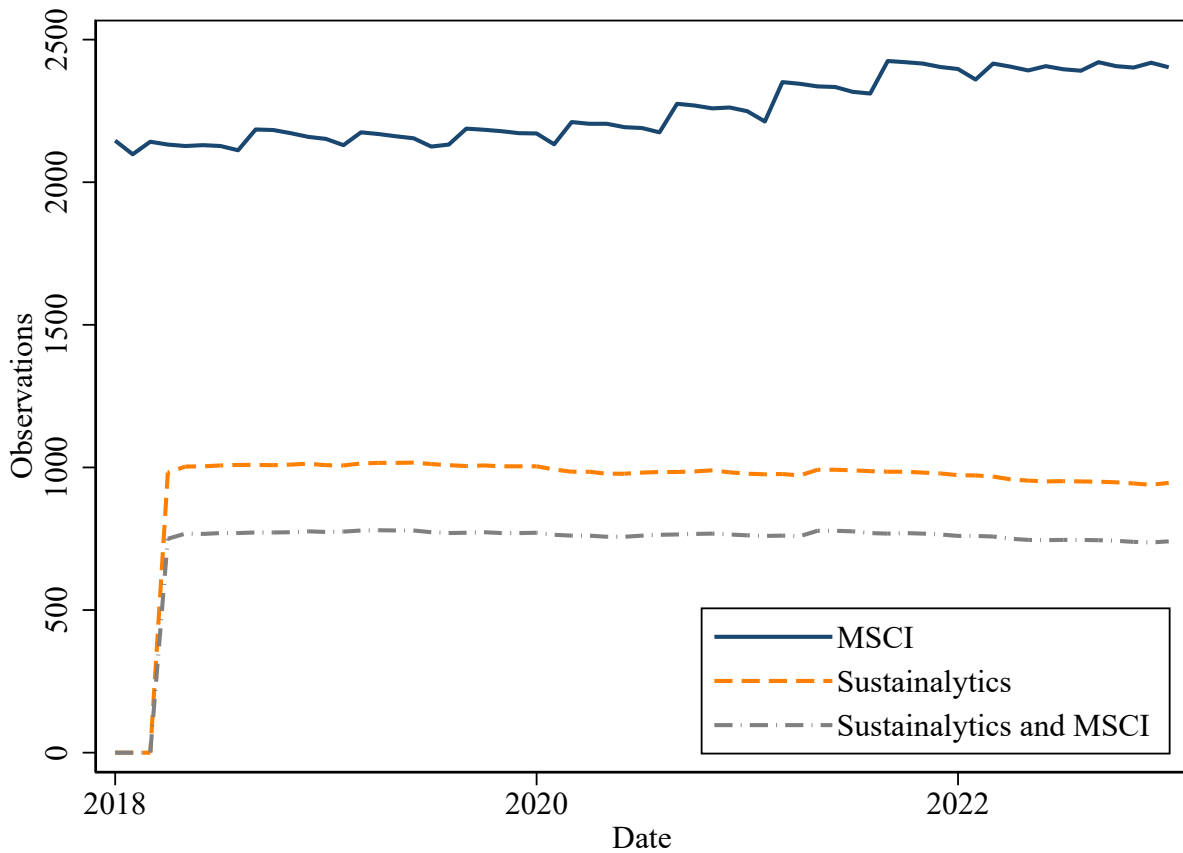


Figure B.11. MSCI and Sustainalytics coverage. This figure shows the number of firms with MSCI and Sustainalytics coverage. “MSCI” denotes firms with non-missing E, S, G, and composite ESG ratings in MSCI. Similarly, “Sustainalytics” denotes firms with complete ratings for the E, S, and G pillars in Sustainalytics. “Sustainalytics and MSCI” denotes firms with complete Sustainalytics and MSCI ratings. This figure does not require non-missing CRSP/Compustat data.

Table B.10. Correlation between MSCI and Sustainalytics Ratings

This table shows the correlation between MSCI and Sustainalytics ESG ratings. Both MSCI and Sustainalytics scores are adjusted by subtracting their respective market means within each quarter. We multiply Sustainalytics scores by -1 . The first column reports the correlation between MSCI ratings and the Sustainalytics ESG ratings. The second column shows the correlation based on cross-sectional percentiles of MSCI and Sustainalytics ratings.

	Level	Percentile
Composite ESG Score	0.27	0.25
E Score	0.78	0.68
S Score	0.19	0.21
G Score	0.17	0.24

B.5.2. Tilts estimated using Sustainalytics scores

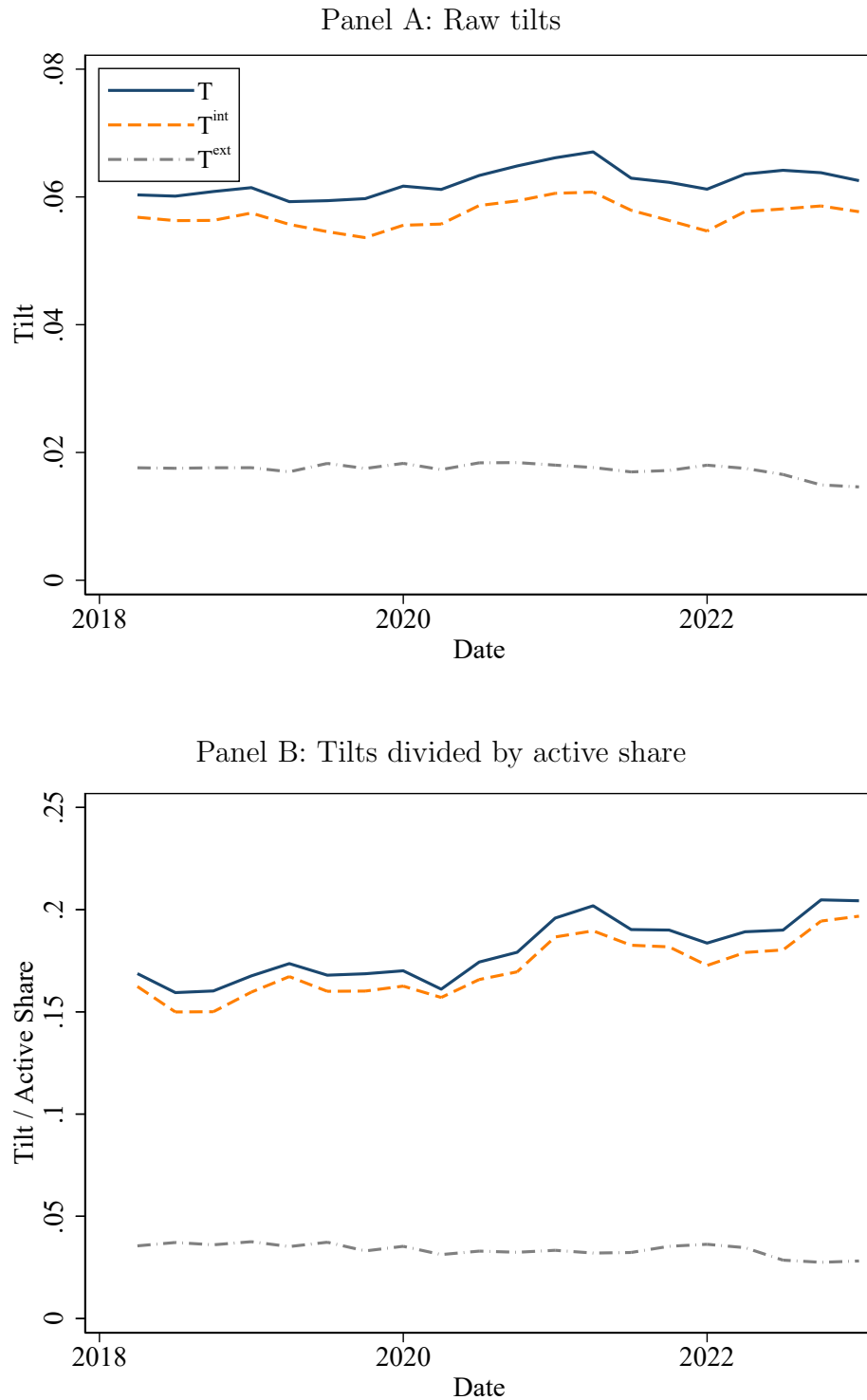
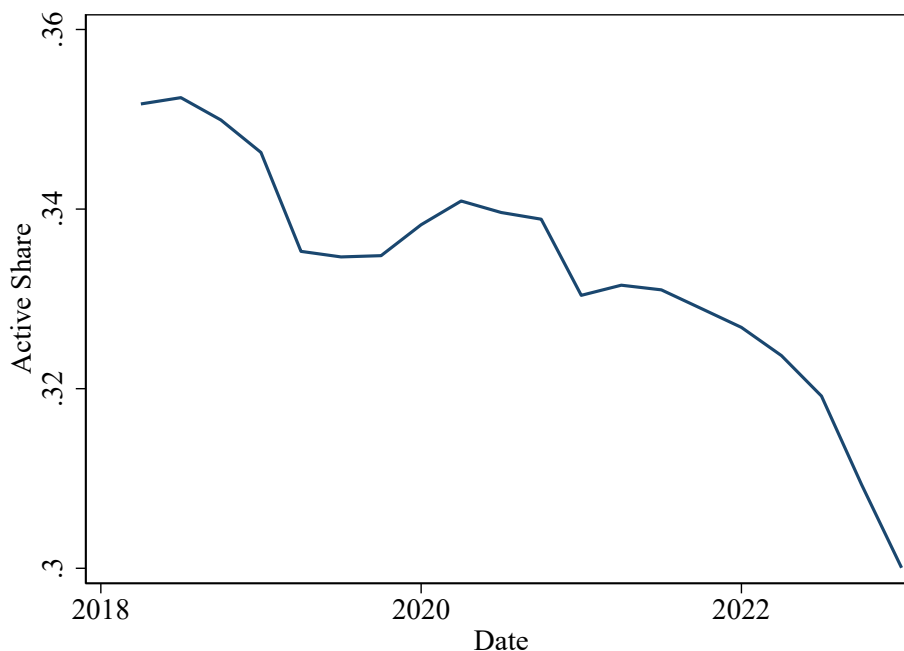


Figure B.12. Total, intensive, and extensive ESG tilts (version with Sustainalytics scores). This figure plots the same quantities as in Figure 1 but with Sustainalytics data.

Panel A: AUM-weighted average



Panel B: Percentiles

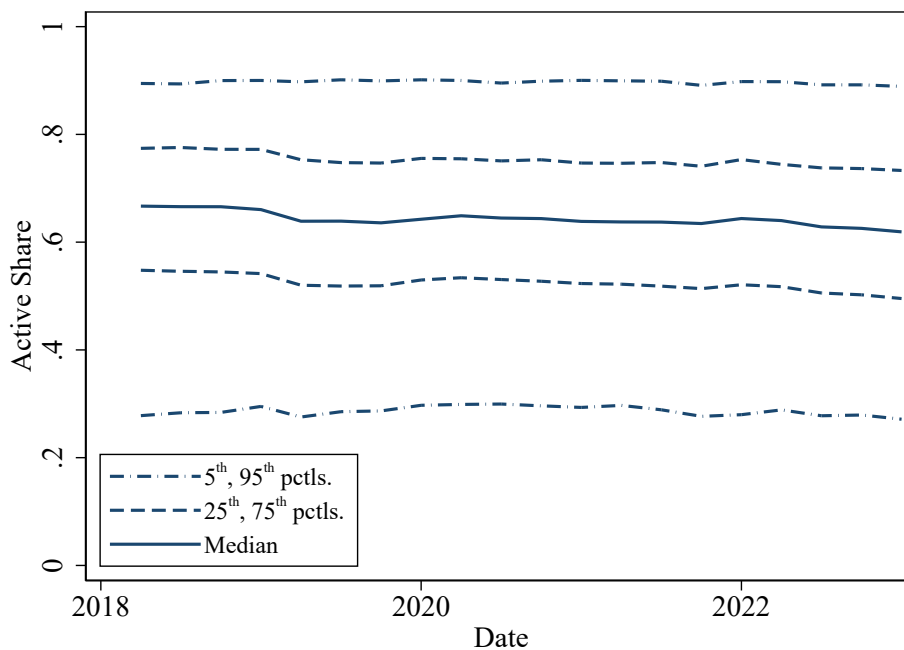


Figure B.13. Active share (version with Sustainalytics scores). This figure plots the same quantities as in Figure 2 but with Sustainalytics data. The figure differs from its MSCI version because the universe of covered stocks is different, and each analysis studies only the holdings of covered stocks.

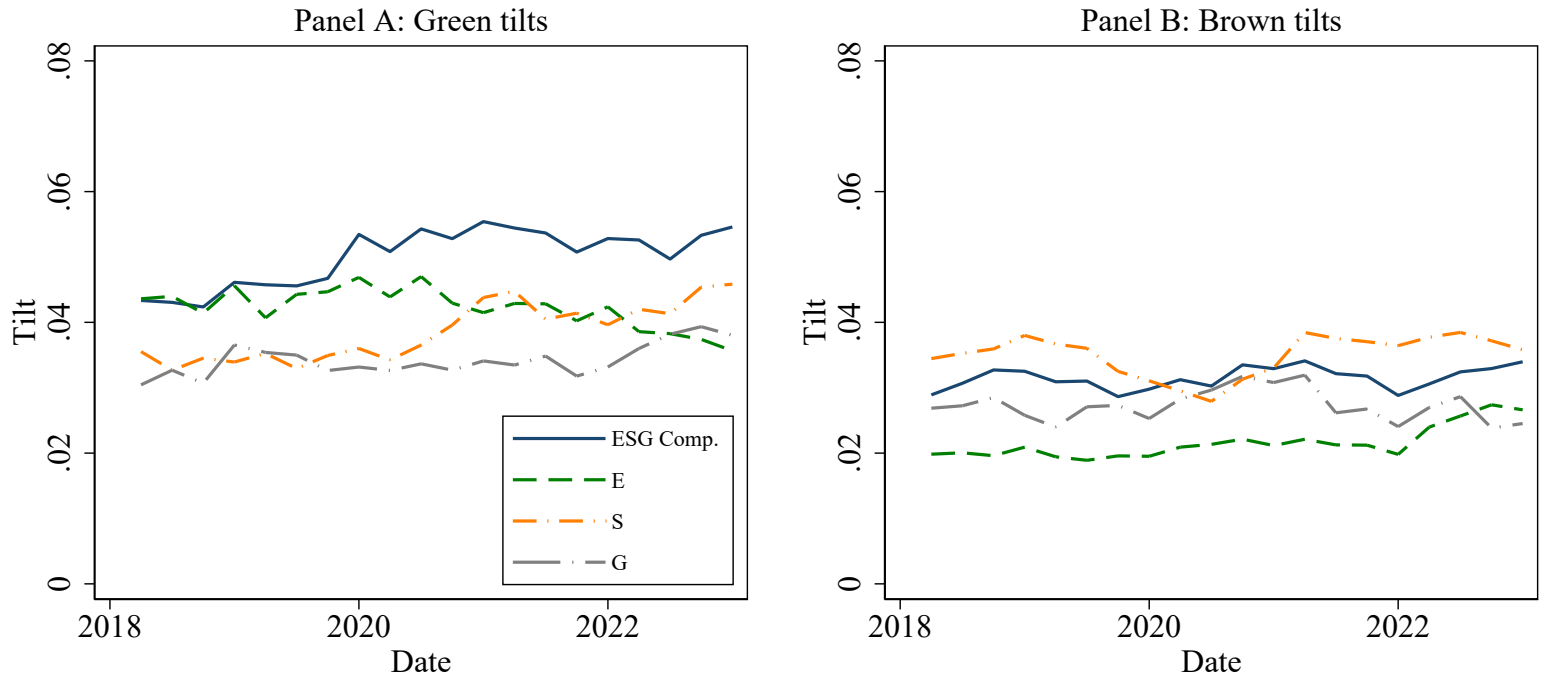


Figure B.14. Green and brown tilts (version with Sustainalytics scores). This figure plots the same quantities as Figure 3 but with Sustainalytics data.



Figure B.15. GMB tilts of 13F filers and non-filers (version with Sustainalytics scores). This figure plots the same quantities as Figure 4 but with Sustainalytics data.

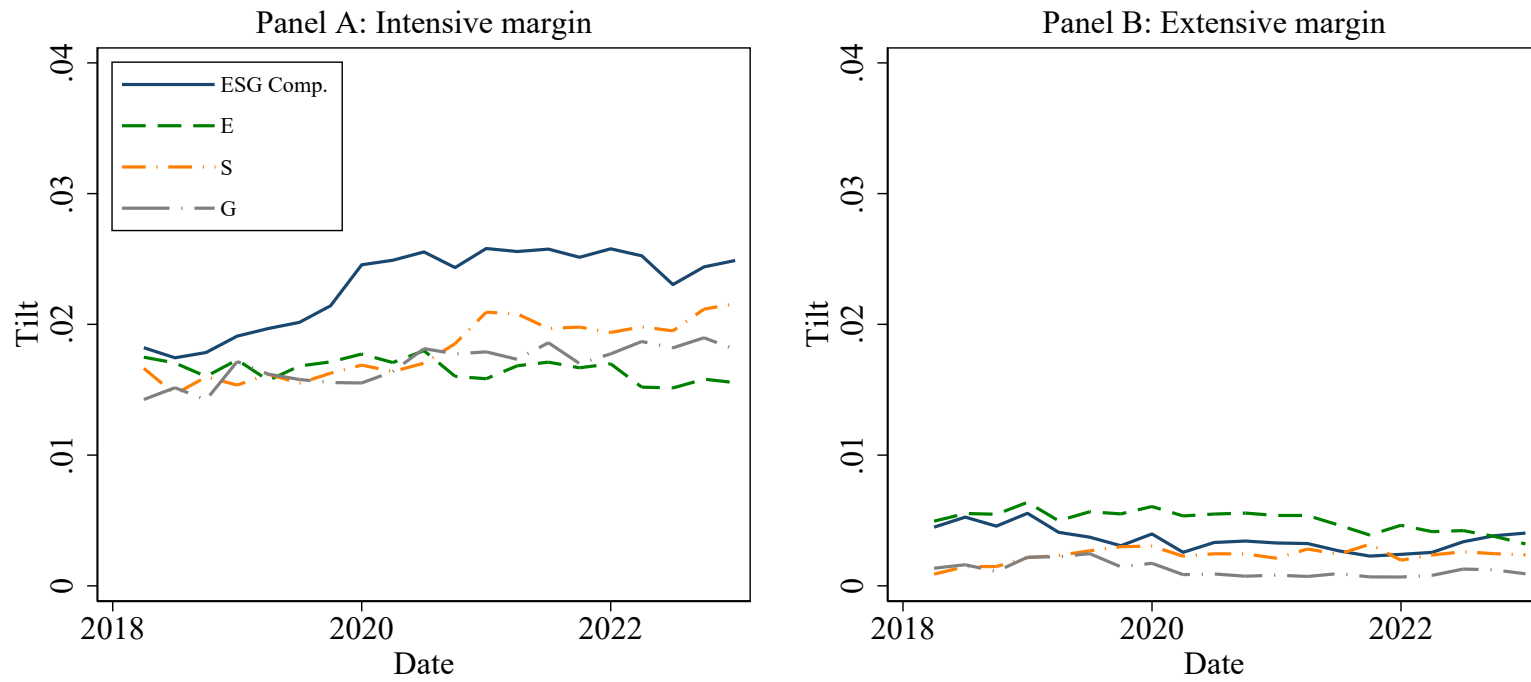


Figure B.16. Divestment from brown stocks (version with Sustainalytics scores). This figure plots the same quantities as Figure 5 but with Sustainalytics data.



Figure B.17. Institution size and greenness (version with Sustainalytics scores). This figure plots the same quantities as Figure 6 but with Sustainalytics data.

Table B.11
Aggregate tilts
(version with Sustainalytics scores)

This table is the counterpart of Table 1 but with Sustainalytics data.

Year	Estimated Tilt			Standard Error		
	Total	Intensive	Extensive	Total	Intensive	Extensive
2019	0.061	0.057	0.018	0.002	0.002	0.001
2020	0.062	0.056	0.018	0.002	0.002	0.001
2021	0.066	0.061	0.018	0.002	0.002	0.001
2022	0.061	0.055	0.018	0.002	0.002	0.001
2023	0.063	0.058	0.015	0.002	0.002	0.001

Table B.12: Which institutions are greener?
(version with Sustainalytics scores)

This table shows the same quantities from Table 2 but with Sustainalytics data. All regressions use 50,309 institution \times quarter non-missing observations from 2019q1–2023q4.

	No Fixed Effects				Time Fixed Effects				Institution Fixed Effects			
	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.
log(AUM)	0.0212 (6.30)	0.0051 (1.79)	0.0104 (3.22)	0.0195 (5.79)	0.0210 (6.22)	0.0048 (1.68)	0.0103 (3.19)	0.0195 (5.79)	0.0012 (0.16)	-0.0068 (-0.85)	-0.0018 (-0.21)	0.0189 (2.20)
log(AUM) \times trend	0.1093 (5.81)	0.0440 (2.58)	0.0640 (3.38)	0.0239 (1.22)	0.1059 (5.63)	0.0391 (2.28)	0.0618 (3.25)	0.0275 (1.39)	0.0920 (5.09)	0.0477 (2.88)	0.0598 (3.14)	0.0180 (0.94)
Trend	0.9779 (4.91)	0.2761 (1.54)	0.5804 (2.92)	0.3357 (1.64)					0.8182 (4.35)	0.3202 (1.87)	0.5306 (2.73)	0.2757 (1.39)
Active share	0.0603 (2.34)	0.1055 (4.35)	0.0212 (0.85)	0.0053 (0.19)	0.0607 (2.36)	0.1064 (4.38)	0.0220 (0.88)	0.0045 (0.16)	-0.0056 (-0.10)	0.0221 (0.41)	-0.0715 (-1.26)	0.0713 (1.27)
1(UNPRI)	0.0277 (2.06)	0.0378 (3.15)	0.0081 (0.67)	0.0064 (0.47)	0.0275 (2.05)	0.0375 (3.13)	0.0080 (0.65)	0.0068 (0.50)	0.0100 (0.45)	0.0120 (0.56)	0.0151 (0.70)	-0.0201 (-0.97)
1(Inv. advisor)	0.0146 (0.55)	0.0269 (1.17)	-0.0187 (-0.72)	0.0223 (0.72)	0.0146 (0.55)	0.0268 (1.17)	-0.0187 (-0.72)	0.0224 (0.72)				
1(Bank)	-0.0195 (-0.68)	0.0072 (0.29)	-0.0181 (-0.66)	-0.0134 (-0.40)	-0.0194 (-0.67)	0.0073 (0.30)	-0.0181 (-0.66)	-0.0134 (-0.40)				
1(Pension/endowment)	0.0505 (1.56)	0.0391 (1.47)	0.0155 (0.46)	0.0328 (0.91)	0.0507 (1.56)	0.0392 (1.47)	0.0155 (0.46)	0.0332 (0.92)				
1(Europe)	0.0408 (2.21)	0.0375 (2.36)	0.0105 (0.56)	0.0270 (1.58)	0.0407 (2.20)	0.0373 (2.35)	0.0103 (0.55)	0.0271 (1.58)				
1(Rest of world)	0.0998 (4.43)	0.0674 (3.51)	0.0037 (0.18)	0.1242 (4.52)	0.0999 (4.43)	0.0675 (3.51)	0.0037 (0.18)	0.1244 (4.52)				
R^2	0.023	0.018	0.003	0.021	0.024	0.019	0.004	0.022	0.653	0.652	0.604	0.662
R^2 (FEs only)	N/A	N/A	N/A	N/A	0.003	0.004	0.001	0.001	0.651	0.650	0.604	0.662
p (Inst. types equal)	0.015	0.152	0.513	0.118	0.015	0.154	0.512	0.117	N/A	N/A	N/A	N/A

**Table B.13: Green and brown tilts
(version with Sustainalytics scores)**

This table shows the same quantities from Table 3 but with Sustainalytics data.

	Green Tilts				Brown Tilts			
	ESG	Env.	Soc.	Gov.	ESG	Env.	Soc.	Gov.
log(AUM)	0.0085 (4.13)	0.0018 (1.08)	0.0035 (1.74)	0.0062 (3.22)	-0.0127 (-6.35)	-0.0032 (-1.89)	-0.0069 (-3.66)	-0.0132 (-6.15)
log(AUM) \times trend	0.0446 (3.75)	0.0232 (1.96)	0.0257 (2.22)	0.0104 (0.93)	-0.0646 (-5.58)	-0.0209 (-2.13)	-0.0383 (-3.29)	-0.0134 (-0.98)
Trend	0.5106 (3.95)	0.1690 (1.35)	0.3179 (2.59)	0.2277 (1.91)	-0.4671 (-3.86)	-0.1082 (-1.04)	-0.2608 (-2.13)	-0.1060 (-0.76)
Active share	0.1780 (11.45)	0.2253 (15.49)	0.1655 (10.68)	0.1604 (9.97)	0.1177 (7.71)	0.1192 (8.38)	0.1454 (10.11)	0.1560 (9.16)
1(UNPRI)	0.0173 (1.94)	0.0263 (3.21)	0.0028 (0.35)	-0.0092 (-1.12)	-0.0104 (-1.47)	-0.0114 (-1.84)	-0.0056 (-0.84)	-0.0157 (-2.02)
1(Inv. advisor)	-0.0003 (-0.02)	0.0135 (1.08)	-0.0155 (-1.13)	0.0111 (0.62)	-0.0149 (-0.87)	-0.0134 (-0.92)	0.0032 (0.17)	-0.0112 (-0.60)
1(Bank)	-0.0198 (-1.28)	-0.0023 (-0.16)	-0.0172 (-1.16)	-0.0021 (-0.11)	-0.0003 (-0.02)	-0.0095 (-0.62)	0.0009 (0.05)	0.0113 (0.54)
1(Pension/endowment)	0.0286 (1.40)	0.0163 (1.02)	0.0229 (1.14)	0.0210 (0.97)	-0.0218 (-1.16)	-0.0228 (-1.43)	0.0083 (0.40)	-0.0118 (-0.55)
1(Europe)	0.0274 (2.26)	0.0311 (2.80)	0.0167 (1.45)	0.0170 (1.77)	-0.0133 (-1.41)	-0.0063 (-0.86)	0.0066 (0.65)	-0.0100 (-0.95)
1(Rest of world)	0.0722 (4.54)	0.0486 (3.23)	0.0095 (0.73)	0.1005 (5.66)	-0.0277 (-2.72)	-0.0186 (-2.67)	0.0056 (0.49)	-0.0239 (-1.72)
R^2	0.051	0.067	0.028	0.047	0.032	0.026	0.029	0.036
p (inst. types equal)	0.007	0.126	0.067	0.150	0.250	0.371	0.953	0.277

B.6. Additional results on mutual funds' tilts

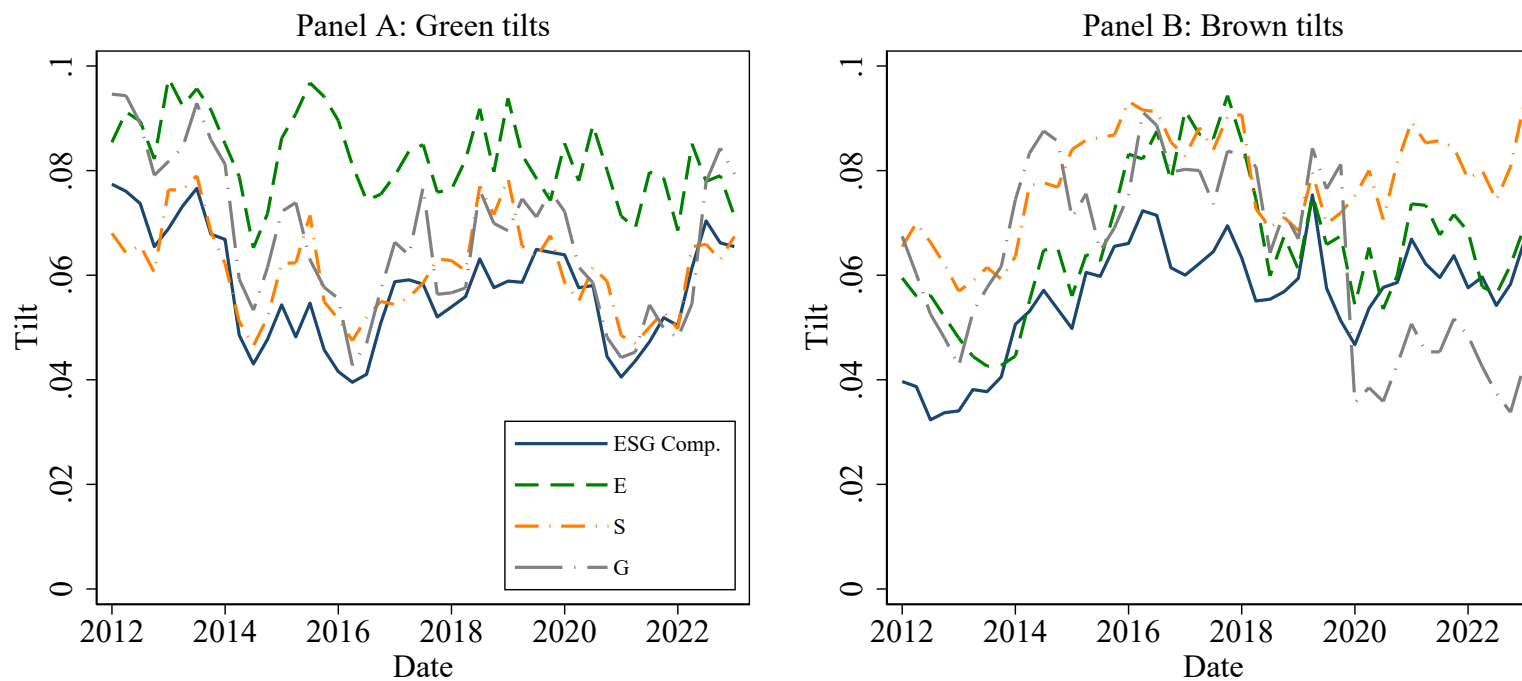


Figure B.18. Active mutual funds' green and brown tilts. This figure plots the same quantities as Figure 10 but with the active mutual fund sample.

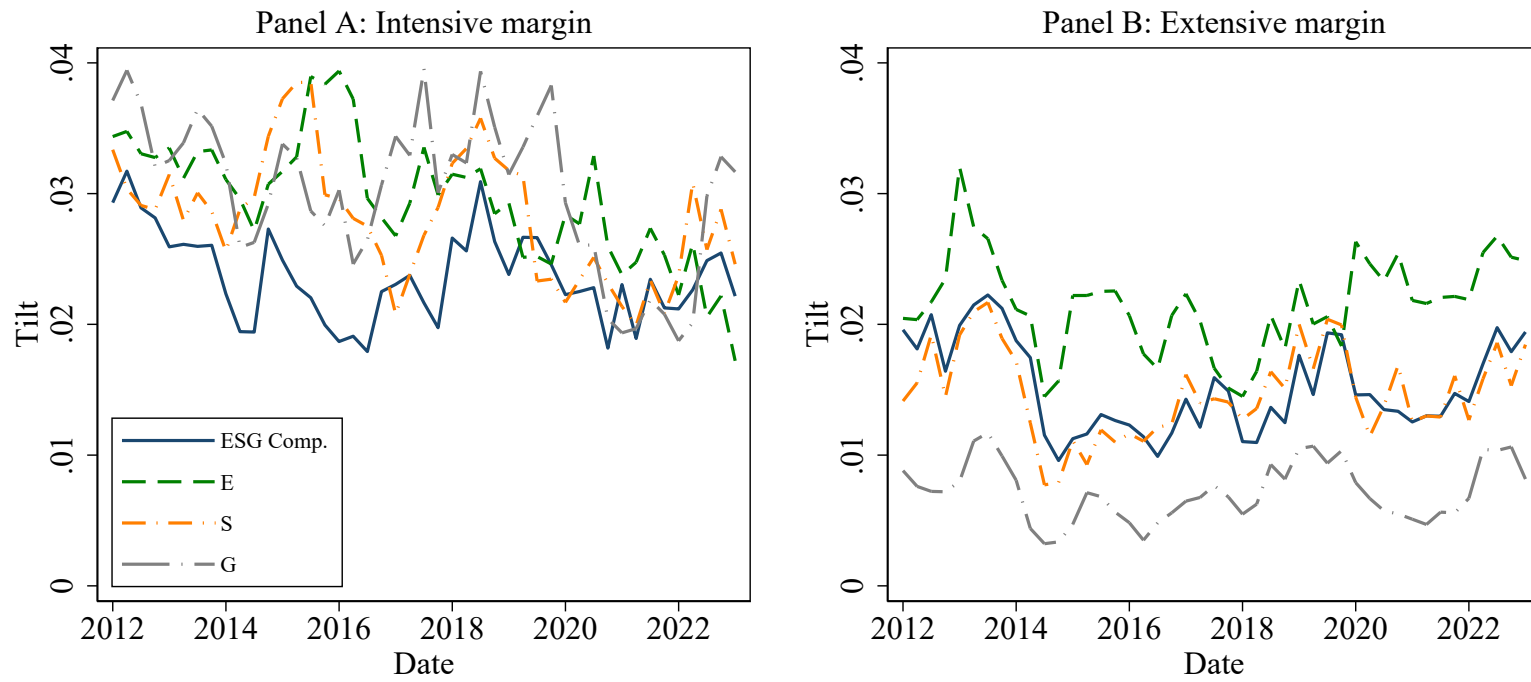


Figure B.19. Active mutual funds' divestment from brown stocks. This figure plots the same quantities as Figure 11 but with the active mutual fund sample.