Long-run stock market adjustment to *changes* in environmental, social, and governance performance (ESG)

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1. Research Question

Empirical motivation:

- Many empirical studies pointed out that **buying the high-ESG and selling the low-ESG performers** leads to **positive abnormal stock returns** (e.g., Derwall et al. 2005; Kempf and Osthoff, 2007; Statman and Glushkov, 2009).
- Manescu (2010) shows that the association between stock returns and ESG (positive/negative) is **not compensation for risk but most likely mispricing**, i.e., ESG performance seems to be value-relevant but it is not efficiently reflected into stock prices

Research questions:

- Do *changes* in ESG performance *also* determine a reaction in stock returns?
- Do *changes* in strengths and weaknesses determine a similar reaction in stock returns?
- Is this relation causal?
- Is the relation linear? (not yet explored)

2. Outline

(a) Model

(b) Data

(c) Findings

(d) Conclusions

3. Model

The baseline model is:

$$\begin{aligned} AbnormalReturn_{it} = f(&\Delta_t Strength_i^j, \Delta_t Weakness_i^j \\ &\Delta_{t-1} Strength_i^j, \Delta_{t-1} Weakness_i^j, \\ &IndustryDummies_i, YearDummies_t) + \epsilon_{it} \end{aligned} \tag{1}$$

Where

- $AbnormalReturn_{it}$ = yearly abnormal return stock i, year t
- $\Delta_t Strength_i^j$ = change between year $t-1$ and year t in the number of strengths in ESG dimension j, $j = 1:7$
  (or between year $t-2$ and year $t-1$ for $\Delta_{t-1} Strength_i^j$)
- $\Delta_t Weakness_i^j$ = change between year $t-1$ and year t in the number of weaknesses in ESG dimension j, $j = 1:7$
  (or between year $t-2$ and year $t-1$ for $\Delta_{t-1} Weakness_i^j$)
- $IndustryDummies_i$ = 9 industry dummies
- $YearDummies_t$ = 15 year dummies
- ϵ_{it} = i.i.d error term

4. Data

4.1. ESG Data

- KLD data for seven ESG dimensions: community, corporate governance, diversity, employee relations, environment, human rights, and product quality, during 1991-2006 (for members of the DS400 and SP500).
- For each dimension, there are 4 to 8 Strength indicators and 3 to 7 Weakness indicators.
- When the strength/weakness is present the indicator gets one, otherwise it is zero.
- **No aggregation of strengths and weaknesses; Instead use year-on-year change in the number of strengths and weaknesses for each dimension.**

4.2. Financial Data

- Abnormal return is Actual (Realized) Return minus Expected Return (yearly basis)
- Expected return is calculated with the four-factor model (systemic risk, size, value and momentum risk factors)

5. Findings

- Generally, weak effect of changes in strengths and weaknesses on abnormal returns
- It is only changes in some weaknesses that have an effect on abnormal returns (governance is strongest)

Selected coefficients	Pooled-OLS	Random Effects
Δ_t Community Weakness	-2.29*	-2.33
Δ_t Governance Weakness	-2.17**	-2.25***
Δ_t Product Weakness	-1.69*	-1.76
Δ_{t-1} Environment Weakness	-1.60*	-1.70

R^2=0.05. Observations: 8131. Dependent variable (abnormal returns) measured in %.
***p<0.01 **p<0.05 *p<0.10

- The 14 Δ strengths have a joint zero effect on abnormal returns (p-value 0.84)
  Their net effect is also zero (p-value 0.58)
- The 14 Δ weaknesses have a joint effect different from zero on abnormal returns (p-value 0.06)
  Their net effect is negative, (p-value 0.96)
- Acquiring an extra weakness (in any dimension) reduces the abnormal return by an estimated 0.57% per year.
- Endogeneity is not a concern (checked with a control function approach)

6. Conclusions

- No solid evidence of strong abnormal stock return adjustment to changes in ESG
- In particular, changes in ESG strengths have *zero* effect on abnormal stock returns => ESG leaders are neither rewarded nor penalized by the market
- However, changes in ESG weaknesses have *negative* effect on abnormal stock returns (of up to 4.05% lower annual return for an extra weakness in all seven dimensions) => ESG laggards are penalized by the market
- Stock market seems mostly sensitive to corporate governance weaknesses.

7. What are the KLD weaknesses (selection)

- Community: investment controversies, negative economic impact
- Corporate governance: high compensation, ownership weakness (in companies rated by KLD as having areas of weaknesses), accounting controversy (since 2006)
- Diversity: controversies (substantial fines/penalties as a result of affirmative action controversies), non-representation - the company has no women on its board of directors/among its senior line managers
- Employee relation: poor union relations, health and safety concern, workforce reductions, substantially underfunded defined benefit plan
- Environment: hazardous waste, regulatory problems, ozone depleting chemicals, substantial emissions, agricultural chemicals, climate change (substantial revenue from oil sales)
- Human rights: controversies with operations in South Africa, Burma, Mexico, labor rights weaknesses
- Product: product safety, marketing/contracting weakness, if the company paid antitrust fines/penalties