

ESG Reporting Divergence

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Research Objective

- To investigate the adverse consequences of ESG reporting divergence for users
 - ESG rating providers
 - Does ESG reporting divergence affect ESG rating disagreement?
 - ESG mutual fund
 - Does ESG reporting divergence affect ESG fund allocation with respect to firms' ESG performance?

What is ESG?





Motivation: ESG reporting divergence

- Accountability requires information.
 - Corporate accountability requires ESG information.
 - While some countries have ESG reporting regulations, others, such as the U.S., do not.
 - ESG reporting is voluntary in the U.S.
 - 70% of Russel 1000 firms reported on ESG activities in 2020
 - Some follow frameworks, but others do not
 - The frameworks followed by companies vary: GRI (59%), SASB (45%), TCFD (23%)
- information is not comparable across firms, which has impeded ESG investing (the 2017 CFO Institute survey)

Examples of difference in ESG reporting

| Field Description | Advanced Micro (<i>i</i>) | Intel (<i>j</i>) |
|---|-----------------------------|--------------------|
| Nitrogen Oxide Emissions | 0 | 1 |
| Climate Change Policy | 0 | 1 |
| Risks of Climate Change Discussed | 0 | 1 |
| Number of Significant Environmental Fines | 1 | 0 |
| Amount of Significant Environmental Fines | 1 | 0 |
| Renewable Energy Use | 1 | 0 |
| Water Consumption | 0 | 1 |
| Quality Assurance and Recall Policy | 0 | 1 |
| Gender Pay Gap Breakout | 0 | 1 |
| % Disabled in Workforce | 0 | 1 |
| Fatalities - Total | 0 | 1 |
| Employee Turnover % | 1 | 0 |
| Total Hours Spent by Firm - Employee Training | 0 | 1 |
| Employee CSR Training | 0 | 1 |

Motivations (cont'd)

- November 2021, the ISSB issued two proposals on sustainability reporting
 - “These proposals respond to calls for more consistent, complete, *comparable* and verifiable sustainability-related financial information (ISSB S1 Exposure Draft, page 5, emphasis added).”
 - March 2022, the SEC proposed rules on climate-related disclosures
 - to “standardize the process so investors find it easier to make *comparisons*.”
- to document the current status of ESG reporting divergence and its consequences

Key Concepts

- ESG activities
 - activities in the ESG area
 - E.g., cutting GHG emission, improving employee safety, improving female representation on board
- ESG performance
 - Performance in the ESG area, commonly proxied by ESG ratings
 - E.g., the level of GHG emission, the number of employee incidents, the % of females on the board
- ESG reporting
 - **Whether the firm discloses the information**
 - **The focus (recognition) in this paper**
 - And if so, whether the definitions and estimations method are the same (the measurement)

Construction of ESG reporting divergence

- What to capture: the heterogeneity in the availability of ESG items
 - 122 standardized ESG reporting fields collected by Bloomberg from firms' ESG reports, annual reports, or websites
- Step 1: to construct a 122×1 vector with indicators that represent the availability of each ESG reporting item for a firm-year:
 - $v_{it} = (d_{it,1}, d_{it,2}, \dots, d_{it,121}, d_{it,122})$
- Step 2: firm-pair-year similarity in the reporting of ESG items
 - $Tanimoto\ Similarity_{ijt} = \frac{v_{it} \cdot v_{jt}}{v_{it} \cdot v_{it} + v_{jt} \cdot v_{jt} - v_{it} \cdot v_{jt}}$
 - the ratio of the number of ESG reporting items disclosed by both firms to the number of ESG reporting items disclosed by at least one firm
- Step 3: ESG reporting divergence at the firm-pair-year: $1 - Tanimoto\ Similarity_{ijt}$

Example: ESG reporting divergence

- Advanced Micro (*i*) and Intel (*j*) in 2020

| | $i \times j$ | $i \times i$ | $j \times j$ |
|-------------------------------------|--------------|--------------|--------------|
| Environmental reporting fields (46) | 22 | 25 | 30 |
| Social reporting fields (46) | 19 | 21 | 30 |
| Governance reporting fields (30) | 29 | 29 | 30 |
| Total | 70 | 75 | 90 |

$$ESG_Diverg = 1 - \text{Tanimoto Similarity} = 1 - \frac{70}{75+90-70} = 0.263$$

$$E_Diverg = 1 - \text{Tanimoto Similarity} = 1 - \frac{22}{25+30-22} = 0.333$$

$$S_Diverg = 1 - \text{Tanimoto Similarity} = 1 - \frac{19}{21+30-19} = 0.406$$

$$G_Diverg = 1 - \text{Tanimoto Similarity} = 1 - \frac{29}{29+30-29} = 0.033$$

Validation tests of the ESG divergence measure

- The ESG reporting divergence measure is lower for firm-pairs with the same reporting frameworks, firm-pairs with similar sizes, and firm-pairs with similar ESG performance than for other firm-pairs.

| | Firm <i>i</i> and firm <i>j</i> adopt the same reporting frameworks | | Other firm-pairs | | Difference | |
|-------------------|---|--------|------------------|---------|------------|---------|
| | Mean | N | Mean | N | Mean | p-value |
| <i>ESG_Diverg</i> | 0.294 | 23,227 | 0.390 | 412,954 | -0.096 | 0.001 |

| | Firm <i>i</i> and firm <i>j</i> in the same extreme firm size quintile | | Firm <i>i</i> and firm <i>j</i> in the opposite extreme firm size quintile | | Difference | |
|-------------------|--|---------|--|--------|------------|---------|
| | Mean | N | Mean | N | Mean | p-value |
| <i>ESG_Diverg</i> | 0.254 | 165,734 | 0.387 | 98,800 | -0.133 | 0.001 |

| | Firm <i>i</i> and firm <i>j</i> in the same extreme ESG performance quintile | | Firm <i>i</i> and firm <i>j</i> in the opposite extreme ESG performance quintile | | Difference | |
|-------------------|--|---------|--|--------|------------|---------|
| | Mean | N | Mean | N | Mean | p-value |
| <i>ESG_Diverg</i> | 0.251 | 106,232 | 0.368 | 65,739 | -0.117 | 0.001 |

Construction of ESG reporting divergence (cont'd)

- Step 4: ESG reporting divergence at the firm-year: ESG_Diverg_{it}
 - The mean of the ESG reporting divergence for each firm $i-j$ pair for all of the other J firms in the same industry (i.e., other than firm i) in year t .
- Industry
 - the SASB's Sustainable Industry Classification System (SICS), which is also used by the ISSB

| Variables | N | Mean | Std. Dev. | P25 | Median | P75 |
|-------------------|--------|-------|-----------|-------|--------|-------|
| <i>ESG_Diverg</i> | 14,927 | 0.316 | 0.118 | 0.222 | 0.295 | 0.401 |
| <i>E_Diverg</i> | 14,927 | 0.916 | 0.105 | 0.863 | 0.957 | 1.000 |
| <i>S_Diverg</i> | 14,927 | 0.600 | 0.161 | 0.478 | 0.583 | 0.715 |
| <i>G_Diverg</i> | 14,927 | 0.095 | 0.051 | 0.064 | 0.085 | 0.108 |

Hypothesis Development

- The impact of ESG reporting divergence on users
 - Costs of information processing (of focal and comparable firms' ESG) ↑
 - For ESG rating providers
 - The reliance on public ESG information ↓
 - The reliance on private information ↑
- **H1:** Ceteris paribus, ESG reporting divergence is positively associated with ESG rating disagreement.

Hypothesis Development

- ESG mutual funds
 - They rely on ESG ratings and ESG information to make asset allocation decisions (Avramov et al. 2022)
 - Firms with better ESG performance attract ESG fund (Hartzmark and Sussman 2019)
- ESG reporting divergence → Costs of information processing ↑
 - ESG funds find it more difficult to evaluate firms' ESG performance
 - → ESG funds' rely less on ESG performance to allocate assets
- **H2:** Ceteris paribus, the association between ESG ratings and ESG fund allocation is weaker for firms with high ESG reporting divergence than for firms with low ESG reporting divergence.

Research Design for H1

$$\begin{aligned}
 & \text{ESG Rating Disagreement}_{it} \\
 & = a_0 + a_1 \text{ESG_Diverg}_{it} + a_2 \text{ESG Disclosure}_{it} + a_3 \text{ESG_Rating}_{it} \\
 & + \text{Firm Controls} + \text{Industry FE} + \text{Year FE} + \text{ESG Rater Combination FE} + \varepsilon_{it}
 \end{aligned}$$

- Dependent variable:
 - *ESG Rating Disagreement*: the standard deviation of a firm's ESG ratings from up to five rating providers
- Main independent variable: *ESG_Diverg*
- Two ESG-related controls
 - ESG rating: the industry-year-adjusted ESG performance (heterogeneity in firms' ESG activities)
 - ESG disclosure: the level of ESG disclosures (Christensen et al. 2022)
- Prediction of H1: $\alpha_1 > 0$

Main Tests of H1 (Table 5)

| Dependent variable | H1 | <i>ESG Rating</i> | <i>E Rating</i> | <i>S Rating</i> | <i>G Rating</i> |
|--------------------------|----|---------------------|---------------------|---------------------|---------------------|
| | | <i>Disagreement</i> | <i>Disagreement</i> | <i>Disagreement</i> | <i>Disagreement</i> |
| | | (1) | (2) | (3) | (4) |
| <i>ESG_Diverg</i> | + | 2.810** (2.10) | | | |
| <i>E_Diverg</i> | + | | 13.029*** (6.94) | | |
| <i>S_Diverg</i> | + | | | 2.329*** (2.77) | |
| <i>G_Diverg</i> | + | | | | 7.519*** (2.99) |
| Control variables | | Yes | Yes | Yes | Yes |
| Year FE | | Yes | Yes | Yes | Yes |
| Industry FE | | Yes | Yes | Yes | Yes |
| ESG Rater Combination FE | | Yes | Yes | Yes | Yes |
| N | | 14,927 | 14,927 | 14,927 | 14,927 |
| Adj. R ² | | 0.169 | 0.403 | 0.210 | 0.113 |

- ESG reporting divergence is positively associated with ESG rating disagreement
- Economic significance
 - A relative increase of 2.4% (6.4%, 2.5%, 2.7%) from sample mean for ESG (E, S, G) reporting divergence

Research Design for H2

$$\begin{aligned}
 \text{ESG Fund Holding}_{it} &= a_0 + a_1 \text{ESG_Rating}_{it} + a_2 \text{ESG_Diverg}_{it} \times \text{ESG_Rating}_{it} + a_3 \text{ESG_Diverg}_{it} \\
 &+ a_4 \text{ESG Disclosure}_{it} + \text{Firm Controls} + \text{Industry FE} + \text{Year FE} \\
 &+ \text{ESG Rater Combination FE} + \varepsilon_{it}
 \end{aligned}$$

- Dependent variable:
 - $\text{ESG Fund Holding}_{it}$: the percentage of firm i 's outstanding shares held by ESG mutual funds at the end of year t
- Prediction of H2: $\alpha_2 < 0$

Main Tests of H2 (Table 6)

| Dependent variable | H2 | ESG Fund Holding | | | |
|---------------------------------------|----|----------------------|--------------------|----------------------|-------------------|
| | | (1) | (2) | (3) | (4) |
| <i>ESG_Rating</i> | | 0.092*** (7.15) | | | |
| <i>ESG_Diverg</i> × <i>ESG_Rating</i> | – | -0.254*** (-2.72) | | | |
| <i>E_Rating</i> | | | 0.079*** (5.23) | | |
| <i>E_Diverg</i> × <i>E_Rating</i> | – | | -0.164* (-1.69) | | |
| <i>S_Rating</i> | | | | 0.056*** (4.47) | |
| <i>S_Diverg</i> × <i>S_Rating</i> | – | | | -0.243*** (-3.91) | |
| <i>G_Rating</i> | | | | | 0.034** (2.36) |
| <i>G_Diverg</i> × <i>G_Rating</i> | – | | | | -0.022 (-0.10) |
| Control variables | | Yes | Yes | Yes | Yes |
| Year FE | | Yes | Yes | Yes | Yes |
| Industry FE | | Yes | Yes | Yes | Yes |
| ESG Rater Combination FE | | Yes | Yes | Yes | Yes |
| N | | 12,573 | 12,573 | 12,573 | 12,573 |
| Adj. R ² | | 0.198 | 0.196 | 0.190 | 0.187 |

➤ ESG reporting divergence is negatively associated with the sensitivity of ESG fund holdings to ESG ratings.

➤ Economic significance

- A relative decrease of 32.6% (24.5%, 51.2%, 7.6%) from sample mean for ESG (E, S, G) reporting divergence

Sensitivity Tests (Table 7)

- Use 4-digit SIC codes to classify industries
- Control for firm, instead of industry, fixed effects
- Calculate ESG reporting divergence using industry peers with similar size
- Remove observations with extreme values (similar in not reporting ESG items: small ESG disclosure scores but high ESG reporting divergence)

Additional test: Market reaction to negative ESG news

- Another important set of users of ESG information: investors
- Impact of ESG reporting divergence
 - Costs of information processing (of focal and comparable firms' ESG) ↑
 - Difficulty in updating beliefs of firms' ESG performance based on ESG news ↑
 - Market reaction to ESG news ↓
- ESG news
 - Negative ESG news compiled by RepRisk
- Market reaction
 - 2-day abnormal stock returns: $CAR(0, +1)$
 - Average: significantly negative

Market reaction to negative ESG news (Table 8)

- ESG reporting divergence is negatively associated with the market reaction to negative ESG news

| Dependent variable | <i>CAR (0, +1)</i> |
|--------------------------|--------------------|
| <i>ESG_Diverg</i> | 0.414*** (3.19) |
| Control variables | Yes |
| Date FE | Yes |
| Industry FE | Yes |
| ESG Rater Combination FE | Yes |
| N | 36,604 |
| Adj. R ² | 0.115 |

Additional test: Spillover effect of EU regulation

➤ EU Directive 2014/95

- In 2014, the European Union (EU) passed Directive 2014/95
 - public-interest entities in the EU with more than 500 employees to prepare annual nonfinancial reports (i.e., ESG reports) from fiscal year 2017.
 - The objective: “to increase the relevance, consistency and comparability” of ESG reporting among the EU firms.
- This applies to US firms’ subsidiaries in the EU

→ Potential effect on US parent firms

- ↓ ESG reporting divergence among industries with a high proportion of firms with subsidiaries in the EU (treatment firms)
- ↓ ESG rating disagreement
- ↑ ESG fund allocation with respect to ESG performance

Additional test: Spillover effect of EU regulation

➤ Impact on ESG divergence

| Dependent variable | <i>ESG_Diverg</i> | <i>E_Diverg</i> | <i>S_Diverg</i> | <i>G_Diverg</i> |
|--------------------|-------------------|-----------------|-----------------|-----------------|
| | (1) | (2) | (3) | (4) |
| <i>Treat_Post</i> | -0.062*** | -0.059*** | 0.006 | -0.002 |
| | (-4.64) | (-5.35) | (0.35) | (-0.38) |

➤ Impact on ESG rating disagreement and the association with ESG fund holdings and ESG ratings

| Dependent variable | <i>E Rating Disagreement</i> | <i>ESG Fund Holding</i> |
|-------------------------------------|------------------------------|-------------------------|
| | (1) | (2) |
| <i>Treat_Post</i> | -0.071** | 0.096 |
| | (-2.01) | (1.56) |
| <i>E Rating</i> | | 0.098*** |
| | | (4.85) |
| <i>Treat_Post</i> × <i>E Rating</i> | | 0.134* |
| | | (1.69) |

Contributions

- This is the first paper that provides systematic evidence on ESG reporting divergence among US firms.
- This paper contributes to the literature
 - ESG rating disagreement: ESG reporting divergence is an important determinant
 - Comparability: this paper extends the literature from financial reporting comparability to non-financial information comparability
- The paper provides suggestive evidence on the potential effect of the SEC proposals on climate risk and ISSB proposals on sustainability reporting.