Socially Responsible Institutional Ownership and Stock Price Informativeness

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The Popularity of Socially Responsible Investing

- The Principles of Responsible Investment (PRI) signatory growth in 2006-2021

PRI Signatories' Commitment

Signatories' commitment

"As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time).

Research Question

- Do socially responsible institutions (SRIs) actually practice their commitment and help incorporate long-term value information into stock prices?
- Specifically, we examine how SRIs affect the **information content of prices** on the financial market.

Competing Hypotheses

If SRIs practice the innate expectation of socially responsible investment strategies:

- They are supposed to gather, analyze, and act upon financially relevant ESG information that forecasts future fundamentals.
- It will likely result in stock prices reflecting more future firm earnings.

H1: SRIs will increase price informativeness.

Competing Hypotheses

Alternatively:

- SRIs might impede the integration of future earnings information into stock prices if they underweight long-term financial information, or overweight ESG information not relevant to long-term financial performance.
- Goldstein, Kopytov, Shen, and Xiang (2022) imply from their equilibrium model that as the share of green investors increases, asset prices become less informative about the financial payoff and more informative about the ESG payoff.

H2: SRIs will decrease price informativeness.

Basic Setting

We follow the Collins, Kothari, Shanken, and Sloan (1994) and Lundholm and Myers (2002) to use the Future Earnings Response Coefficient (FERC) Model:

$$RET_{i,t} = \gamma_0 + \gamma_1 E_{i,t-1} + \gamma_2 E_{i,t} + \gamma_3 E_{i,t3} + \gamma_4 RET_{i,t3} \quad (1)$$

- γ_2, the coefficient of $E_{i,t}$, is the ERC, which reveals how the current earnings are incorporated into the current returns.
- γ_3, the coefficient of $E_{i,t3}$, is the FERC (our focus), which reveals how the future earnings are incorporated into the current returns.
- $E_{i,t3}$ is the sum of scaled earnings in the following three years.
- We control for $E_{i,t-1}$ and $E_{i,t}$, the scaled past and current earnings.

Basic Setting

- We interact all the independent variables in Equation (1) with our main independent variable, SRIO, and control variables:

$$\begin{aligned} RET_{i,t} =& \gamma_0 + \gamma_1 E_{i,t-1} + \gamma_2 E_{i,t} + \gamma_3 E_{i,t3} + \gamma_4 RET_{i,t3} + \gamma_5 SRIO_{i,t} + \\ & \gamma_6 SRIO_{i,t} \times E_{i,t-1} + \gamma_7 SRIO_{i,t} \times E_{i,t} + \gamma_8 SRIO_{i,t} \times E_{i,t3} + \\ & \gamma_9 SRIO_{i,t} \times RET_{i,t3} + Other\ Controls \quad (2) \end{aligned}$$

- γ_8 in Equation (2), which captures how SRIO will affect the FERC, is our major coefficient in interest.

- Competing Hypotheses:
  - SRIs will increase price informativeness $\rightarrow \gamma_8$ is positive.
  - SRIs will decrease price informativeness $\rightarrow \gamma_8$ is negative.

Results Preview

We find that SRIs will reduce stock price informativeness.

1. A higher level of SRIO is associated with a lower level of FERC.
2. We use the Morningstar rating shock to establish causality.
3. The contemporaneous market response for earnings forecast revision (ESG incident) is smaller (larger) for firms with more SRIO.
4. The effect of SRIs on price informativeness is more pronounced:
   - For firms with higher ESG score disagreement;
   - For firms with more ESG incidents.
   - For periods with higher Wall Street Journal (WSJ) Climate Change News Index.
5. The increase in SRIO will cause the stock price to incorporate more future ESG information.

Data

Databases

- Firm Characteristics: CRSP, Compustat, I/B/E/S, KLD, etc.
- Institutional Ownership: Thomson Reuters
- Others: Morningstar, EDGAR, Bloomberg, etc.

Sample

- All US firms
- 22,059 firm-year observations, from 2004 to 2019

Variable Construction

- SRIO (Cao et al. (2023))
- Control Variables (Drake et al. (2015))
- All variables winsorized at 1% level

SRIO - Socially Responsible Institutional Ownership

Step1: Calculate Institutional Social Responsible Score (ISRS), each year

- $ISRS_{i,t} = \sum_{j \in i} w_{j,t} ESG_j$
- Every year, institutional social responsible score is the weighted average of size-adjusted ESG performance of the stocks in the institutional portfolio.
- $w_{j,t}$ is the weight of stock j in institution i's portfolio at the end of year t

Step2: Define Social Responsible Institutions

- Rank institutions according to Institutional Social Responsible Score (ISRS)
- Top tercile: socially responsible institutions

Step3: Measure percentage of SR institutions for each stock, each quarter

- $SRIO_{j,t} = \frac{\textit{of shares held by SR institutions}}{\textit{of shares held by all the institutions}}$

Baseline Results

- We run the FERC model:

$$RET_{i,t} = \gamma_0 + \gamma_1 E_{i,t-1} + \gamma_2 E_{i,t} + \gamma_3 E_{i,t3} + \gamma_4 RET_{i,t3} + \gamma_5 SRIO_{i,t} + \gamma_6 SRIO_{i,t} \times E_{i,t-1} + \gamma_7 SRIO_{i,t} \times E_{i,t} + \gamma_8 SRIO_{i,t} \times E_{i,t3} + \gamma_9 SRIO_{i,t} \times RET_{i,t3} + Other\ Controls \quad (2)$$

- A one-standard deviation increase in SRIO (0.088) is associated with around 8.95% (0.088*0.475/0.467) decrease in the FERC.

	Return(t)		Return(t)
Earning(t-1)	-0.186**	SRIO(t) × Earning(t-1)	0.911
	(-2.86)		(1.53)
Earning(t)	0.678***	SRIO(t) × Earning(t)	-0.268
	(7.37)		(-0.73)
Earning(t3)	**0.279*** **	SRIO(t) × Earning(t3)	**-0.475** **
	(9.51)		**(-2.38)**
Controls	Yes	Controls	Yes
Fixed Effects	Year&Firm	Fixed Effects	Year&Firm
Observations	21,478	Observations	21,478
Adjusted R2	0.56	Adjusted R2	0.61

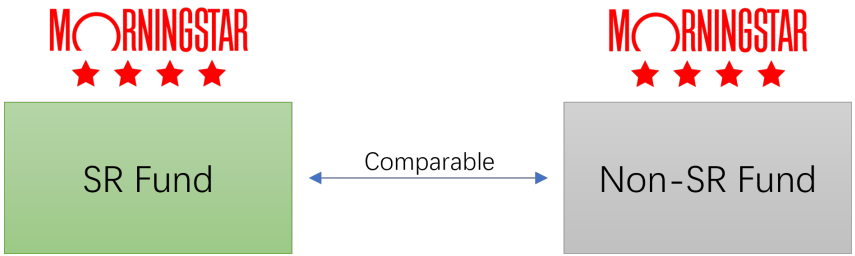
Identification - Process

Following Heath et al. (2023), we rely on the the discontinuity in Morningstar's "star ratings" as an exogenous shock to our independent variable, SRIO.

- Identify SR funds, with Morningstar rating of N (e.g., 5), as treated funds.
- Find controls among non-SR funds, with Morningstar rating of N-1 (e.g.,4), with similar historical returns (main factors for rating), AUM, expense ratio, etc.
- Given the fact higher Morningstar rating will attract higher flows, these treated SRI funds will have higher AUM afterwards and increase holdings of their portfolio stocks.
- Back to the stock level, we calculate the total value held by the treated funds, and held by the control funds. Those held more by treated funds are treated stocks, and among other stocks, we find control stocks through propensity matching.

Identification – Process

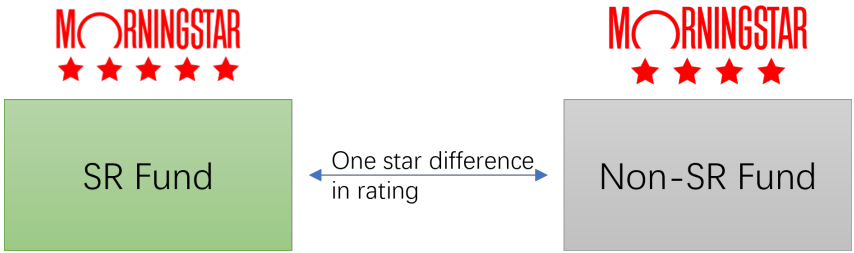
- In December of the pre-treatment year



- Comparable in Morningstar rating, risk-adjusted returns, asset under assets (AUM), expense ratio, and management fees.

Identification – Process

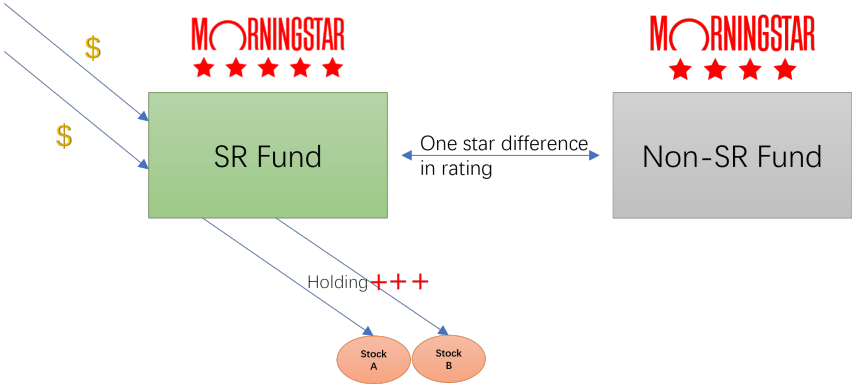
- In January of the shock year



- Treated funds (SR funds) have one-star-higher ratings than control funds (non-SR funds).

Identification – Process

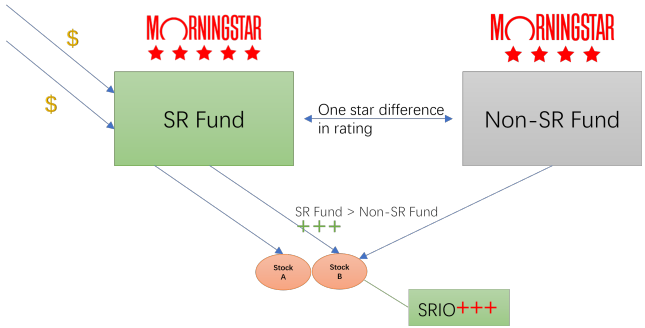
- In the shock year



- Treated funds (SR funds) attract more cash flows than control funds (non-SR funds), and thus increase their holdings proportionally.

Identification – Process

- In the shock year



- We assume SR institutions (relative to non-SR institutions) will act in a similar behavior to the SR funds (relative to the control funds).
- Thus, treated firms are expected to experience an increase in SRIO compared with the control firms.

Identification – Results

- For treated firms, there is an increase in SRIO, and the price contains less information about future earnings.
- Our results remain robust if we use this shock to conduct the IV analysis.

	SRIO(t)
PRE_2(t) × Treat(t)	0.001
	(0.27)
PRE_1(t) × Treat(t)	-0.006
	(-1.24)
After(t) × Treat(t)	**0.012****
	(2.16)
Controls	Yes
Fixed Effects	Event_Year&Firm
Observations	3,681
Adjusted R2	0.55

	Return(t)
PRE_2(t) × Treat(t) × Earning(t3)	0.256
	(0.95)
PRE_1(t) × Treat(t) × Earning(t3)	-0.238
	(-1.23)
After(t) × Treat(t) × Earning(t3)	**-0.601*****
	(-3.92)
Controls	Yes
Fixed Effects	Event_Year&Firm
Observations	3,681
Adjusted R2	0.39

Channel Hypothesis

Why will SRIs decrease stock price informativeness?

- Information Underweighting Hypothesis
  - Due to their ESG preference, SRIs underwight long-term financial information, or overweight ESG information.
- Contemporaneous Market Reactions to Future Earnings (ESG) News
  - Earnings Forecasts Revisions
  - ESG incidents
- Proxy for Investors' Attention to ESG Information
  - ESG rating disagreement
  - Number of ESG incidents
  - WSJ climate change news index

Channel – Information Weighting

- Cumulative abnormal returns around each management forecast revision date is less sensitive to the revision value relative to the previous forecast among firms with SRIO above the median each year-month.

	CAR[-1,1]	
High SRIO × Management Forecast Revision	**-1.198*** **	**-1.173** **
	(-3.94)	**(-3.91)**
High SRIO	0.002*	0.001
	(1.76)	(1.05)
Management Forecast Revision	4.608***	4.558***
	(18.29)	(18.36)
Controls	No	Yes
Fixed Effects	Year-month&Firm	Year-month&Firm
Observations	22,511	22,511
Adjusted R2	0.12	0.12

Channel – Information Weighting

- Cumulative abnormal returns (CARs) around the novel and severe ESG incident are negative on average in our sample.
- Those CARs are more negative for firms with with SRIO above the median each month.

	CAR[-1,1]	
High SRIO	**-0.321****	**-0.316****
	(-2.11)	**(-2.20)**
Controls	No	Yes
Fixed Effects	Year-month&Firm	Year-month&Firm
Observations	5,175	5,175
Adjusted R2	0.04	0.04

Channel – Information Weighting

- Our results are stronger for firms with higher ESG rating disagreement and more ESG incidents, and for periods with higher climate change news index.

	Return(t)		
Attention to ESG(t)=	ESG Rating Disagreement	Number of ESG Incidents	WSJ Cimate Change News Index
Attention to ESG(t) × SRIO(t) × Earning(t-1)	-0.368	-1.589***	-0.431
	(-0.85)	(-3.30)	(-1.05)
Attention to ESG(t) × SRIO(t) × Earning(t)	0.761*	1.039**	0.408
	(1.81)	(2.03)	(0.90)
Attention to ESG(t) × SRIO(t) × Earning(t3)	**-0.407****	**-0.461****	**-0.323****
	(-2.34)	**(-2.37)**	**(-2.26)**
Controls	Yes	Yes	Yes
Fixed Effects	Year&Firm	Yes	Yes
Observations	13,835	7,519	19,764
Adjusted R2	0.63	0.67	0.62

Alternative Stories

- In addition to the information weighting, SRIs may lack the earning information processing skills for a specific firm, resulting in a decrease in the price informativeness.

- In response to the information demand from SRIs, firms may disclose more ESG-related information (e.g., Flammer, Toffel, and Viswanathan (2021)) and sacrifice the earnings disclosure because of the disclosure costs (Christensen, Hail, and Leuz (2021)).
  - Earning information supply
  - ESG information supply

Consequences

- A higher level of SRIO is associated with a higher level of future ESG information response coefficient.

	Return(t)	
SRIO(t) × Earning(t3)		-0.597**
		(-2.48)
SRIO(t) × ESG Score Change(t3)	**0.088***	**0.085***
	(1.95)	**(1.97)**
Controls	Yes	Yes
Fixed Effects	Year&Firm	Year&Firm
Observations	18,513	18,513
Adjusted R2	0.57	0.62

Summary

1. There is an economically significant negative causal relationship between SRIO and stock price informativeness.
2. Our results are inconsistent with the investor skill hypothesis or the information supply hypothesis.
3. Our results are consistent with the information weighting hypothesis:
   - The market reacts less (more) to the future earnings information (ESG information) for firms with a higher level of SRIO.
   - The documented relationship is more pronounced for firms with higher ESG rating disagreement and more ESG incidents, and for periods with higher WSJ climate change news index.
4. A higher level of SRIO will lead to an increase in the future ESG response coefficient.

All Comments Are Welcome!

Baseline Results - Material SRIO

- We decompose SRIO into the two categories for a given firm-year to obtain Material SRIO and Other SRIO, based on the median of the portfolio-level financially material ESG scores.
- Financially material ESG scores are classified according to the guidance from the Sustainability Accounting Standards Board (SASB).

	Return(t)
Material SRIO(t) × Earning(t3)	0.354
	(0.81)
Other SRIO(t) × Earning(t3)	**-0.711****
	(-2.51)
Controls	Yes
Fixed Effects	Year&Firm
Observations	21,478
Adjusted R2	0.61

Baseline Results - Alternative Measure of SRIO

- Our results are robust if we use an alternative measure of SRIO by replacing the denominator with total shares outstanding.

	Return(t)
$SRIO^{+}$(t) × Earning(t-1)	1.358
	(1.49)
$SRIO^{+}$(t) × Earning(t)	-0.317
	(-0.63)
$SRIO^{+}$(t) × Earning(t3)	**-0.648****
	(-2.21)
Controls	Yes
Fixed Effects	Year&Firm
Observations	21,478
Adjusted R2	0.61

Proxy for Investors' Attention to ESG Information

- ESG Rating Disagreement
  - Institutional investors may refer to their own analysts when ESG rating providers disagree, creating inappropriate attention allocation and a greater weighting imbalance between the ESG and earnings information.
  - Measure: The standard deviation of rating ranks (10 ranks) from four databases (i.e., KLD, IVA, TR ASSET4, SUSTAINALYTICS).

- Number of ESG Incidents
  - When ESG incidents occur, SRIs will react to these ESG incidents, paying more attention to and weighting even more on ESG information.
  - Measure: The number of severe and novel ESG incidents (i.e., with RepRisk's Severity and Novel measures equal to or larger than two).

- WSJ Climate Change News Index
  - Measure: The average of raw monthly WSJ climate change news index constructed by Engle, Giglio, Kelly, Lee, and Stroebel (2020).

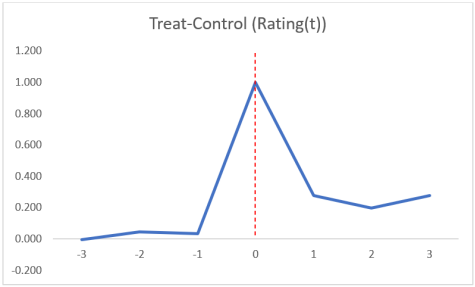
Identification – Fund Level

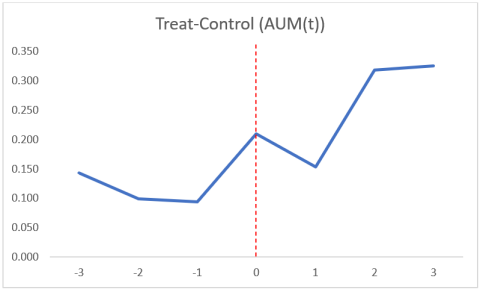
- Treated funds and control funds are comparable in several characteristics before the treatment year

	Treatment Group	Control Group	Difference	t-test (p-value)
Rating	3.211	3.158	0.053	0.421
AUM	2773.203	2423.439	349.764	0.629
3YRETA	0.097	0.093	0.004	0.252
5YRETA	0.084	0.080	0.003	0.276
10YRETA	0.077	0.076	0.001	0.685
EXP	0.009	0.009	0.000	0.917
MGMT_FEE	0.584	0.263	0.321	0.145

Identification – Fund Level

- Treated funds have a higher rating by design
- AUM is higher for treated funds, indicating a higher flow
- The results are also significant using regressions





Identification – Stock Level

- Back to the stock level, those held more by treated funds are treated stocks, and among other stocks, we find control stocks through propensity matching.

	Treatment Group	Control Group	Difference	t-test (p-value)
SRIO	0.105	0.105	0.000	0.989
MVE	8.066	8.012	0.055	0.267
Analyst Coverage	2.305	2.285	0.020	0.580
Leverage	0.511	0.526	-0.014	0.831
IVOL	0.016	0.016	0.000	0.781
ESG Score Change	0.222	0.255	-0.033	0.610

Identification – Stock Level

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