

Measures for a sustainable investment decision making



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Motivation

- Traditional investment decision making: based on economic variables (profitability and risk)
- Increase in the non-economical (environmental, social and corporate governance - ESG) data disclosure due to raising awareness
- Lack of tools for investors to use those data in their analysis
→ need for measures and a way to implement them

Literature Review and Objectives

- Some attempts to measure how well a company performs in environmental and social matters ("ECRI Ethics in Finance & Social Value", Sustainalytics, Hahn and Figge (2011)): some formulas not public, some not feasible for investors (private data), some not size adjusted → **Relative Sustainable Performance Measure (RSPM)**
- No measure to know how well the companies are performing environmentally and socially overtime → **Measure of Commitment-failure (MC)**

Measures for a sustainable investment decision making

Relative Sustainable Performance Measure:

$$VCR_{i,t}^C = Profit_t^C - RU_{i,t}^C * RE_{i,t}^{Market}$$

where:

- $VCR_{i,t}^C$ is the Value Contribution (to the Profit) of the Resource i by the Company C in the year t , measured in the units required in each case
- $Profit_t^C$ is the Total Returns of the Company C in year t measured, in our case, as the EBIT in millions of USD
- $RU_{i,t}^C$ is the Use of the Resource i by the Company C
- $RE_{i,t}^{Market} = \frac{Profit_t^{Market}}{RU_{i,t}^{Market}} = \frac{\sum_{i=1}^N Profit_i^C}{\sum_{i=1}^N RU_{i,t}^C}$ is the Efficiency of Use of the Resource i by the Market in year t
- N is the total number of Companies considered (the set of Companies that make up the sector: in our case, the set of companies that have provided data about all the variables involved in the calculation)

$$RSPM_{i,t}^C = \frac{VCR_{i,t}^C}{TA_t^C}$$

where:

- $RSPM_{i,t}^C$ is the Relative Sustainable Performance Measure of the Resource i of the Company C in year t
- TA_t^C is the Total Assets of the Company C in year t

$$MC_i^C = \left| \frac{\sum_{t=2}^T A_{i,t}^C * Z(A_{i,t}^C)}{W} \right|$$

where:

- $A_{i,t}^C = RSPM_{i,t}^C - RSPM_{i,t-1}^C$
- $Z(A_{i,t}^C)$ is a function which is equal to 1 if $A_{i,t}^C < 0$ and equal to 0 if $A_{i,t}^C \geq 0$
- i can be any of the resources or the Environmental, Social or Total averages
- t is the year
- T the last year for which we have data
- W is the total number of two consecutive year periods with available information to compute $A_{i,t}^C$

Data and Main Results

Database: ASSET4 (Datastream)

Sector: Chemical

Period: 2009-2013

Resources:

1. Environmental:

- a) CO2 emissions
- b) NOx emissions
- c) SOx emissions
- d) VOC emissions
- e) Total Waste
- f) Hazardous Waste
- g) Total Energy Use
- h) Water Use

2. Social:

- a) Injury Rate
- b) Total Donations

Equally weighted averages of the individual RSPMs

Environmental RSPM and MC

Total RSPM and MC

RSPM: The higher the RSPM, the better the company is performing in environmental and social issues.

| | Mean | Median | Minimum | Maximum | % of positive values | % of companies with a positive average value | % of companies with at least one positive value |
|---------------|------------|---------|---------|---------|----------------------|----------------------------------------------|-------------------------------------------------|
| Environmental | 0.0108 | 0.0399 | -1.3134 | 0.2613 | 67.31% | 73.33% | 92.92% |
| Social | -0.1421*** | -0.0241 | -3.3186 | 0.4979 | 38.32% | 40.00% | 56.41% |
| Total | -0.0317* | 0.0142 | -1.4361 | 0.1790 | 57.36% | 58.00% | 84.21% |

MC: The lower the MC, the more committed environmental and social issues is the company (ideal value: MC=0 → No worsening of the RSPM overtime).

| | Mean | Median | Minimum | Maximum | % of 0 values |
|---------------|-----------|--------|---------|---------|---------------|
| Environmental | 0.0238*** | 0.0114 | 0.0000 | 0.2560 | 12.22% |
| Social | 0.0284*** | 0.0092 | 0.0000 | 0.4525 | 18.75% |
| Total | 0.0238*** | 0.0156 | 0.0000 | 0.2257 | 14.00% |

Main Reference:

Hahn, T. and Figge, F. (2011). Beyond the bounded instrumentality in current corporate sustainability research: Toward an inclusive notion of profitability. *Journal of Business Ethics*, 104(3):325–345.

Measure of Commitment-failure:

RSPM and MC validated by 4 analysis:

- Graphical
- Analytical:
 - Pearson correlations
 - Linear regression
 - Spearman correlations

The RSPM gives more information than the ROA
The MC gives different information than the Standard Deviation of the RSPM

Sustainability 2D Analysis:

