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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:

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

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
- $Profit_{i,t}^C$ 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
- $RE_{i,t}^{Market} = \frac{Profit_{i,t}^{Market}}{RU_{i,t}^{Market}} = \frac{\sum_{C=1}^N Profit_{i,t}^C}{\sum_{C=1}^N RU_{i,t}^C}$ 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)

where:

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

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

Measure of Commitment-failure:

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

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:

- CO2 emissions
- NOx emissions
- SOx emissions
- VOC emissions
- Total Waste
- Hazardous Waste
- Total Energy Use
- Water Use

2.Social:

- Injury Rate
- Total Donations

Equally weighted averages
of the individual RSPMs

Environmental RSPM and MC

Total RSPM and MC

Social RSPM and MC

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

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.

Sustainability 2D Analysis:

