

Corporate Environmental Performance: Consistency of Metrics and Identification of Drivers



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What do we Know?

- ▶ Environmental information is considered important in pricing securities.
- ▶ Corporate environmental disclosures do not allow the comparison of environmental performance across companies.
- ▶ Professional research services (ratings) compile performance information in order to compare and rank order companies.
- ▶ More than 100 academic studies examine the link between corporate social/environmental and financial performance (Margolis et al., 2007).

What do we Know?

Concerns:

1. It is difficult to measure environmental performance. Environmental metrics do not provide an accurate assessment of corporate environmental performance (Ilinitch et al., 1998 and Entine, 2003).
2. It is becoming more difficult to differentiate between the increasing number of environmental metrics. More than 30 leading CSR ratings and indexes (Schäfer, 2006).

Trends: the consolidation of the rating agencies, the launch of Global Initiative for Sustainability Rating (normative framework by GRI).

What has Previous Empirical Evidence Showed?

Construct validity:

KLD corporate social performance single metric has a moderate level of correlations with *Fortune reputation score* (Sharfman, 1996).

KLD environmental *weakness* and *strength converge* on the same latent construct and are highly positively correlated (Mattingly and Berman, 2006).

Composite environmental Franklin and CEP ratings are related to *different aspects* of environmental performance construct (Ilinitch et al., 1998).

Validity in terms of transparency about past and future:

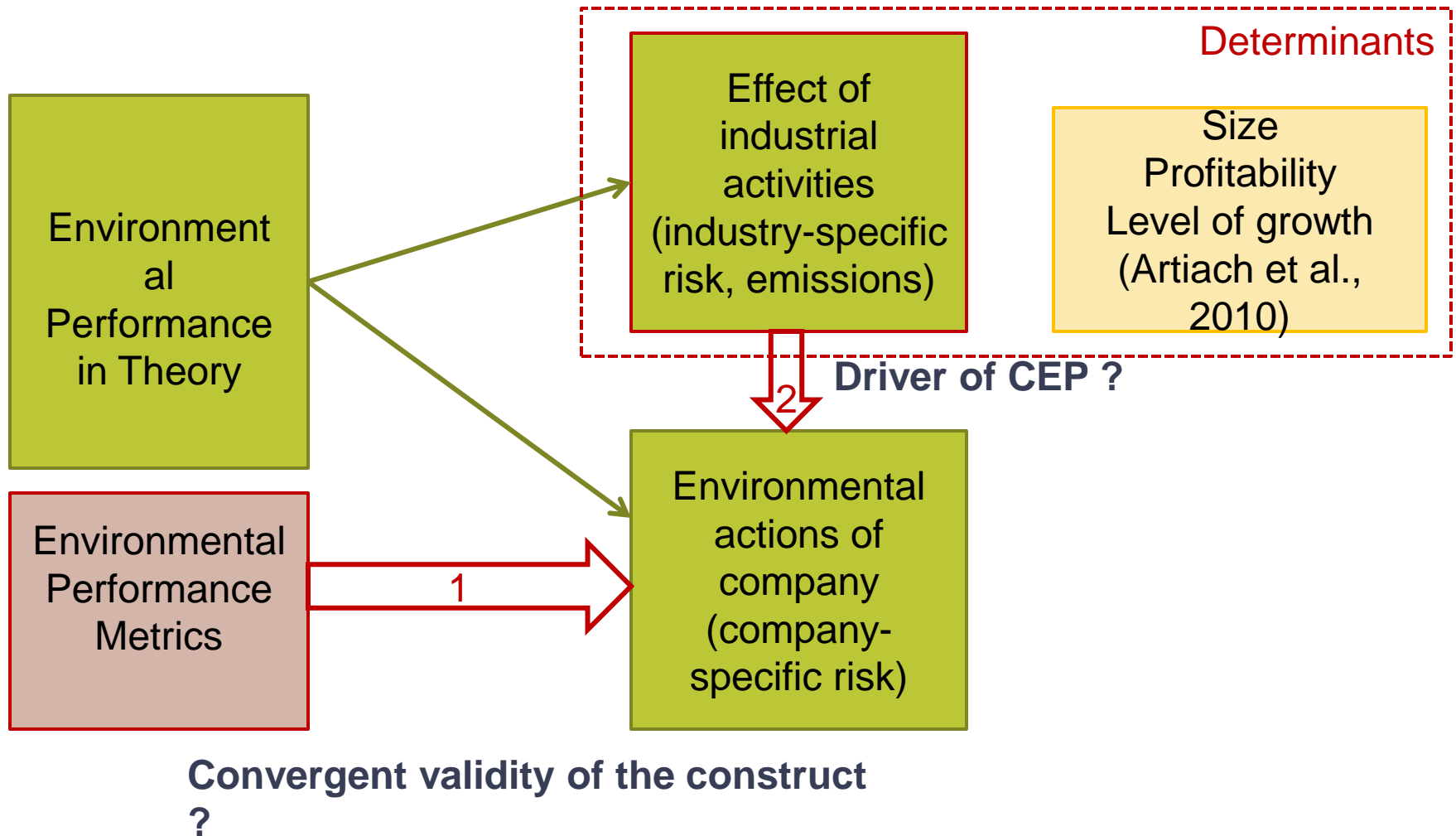
KLD environmental *ratings* provide information about *performance*, but do *not predict* subsequent environmental performance (Chatterji et al., 2009).
SO: Studies focus merely upon the validation of KLD metrics. The environmental benchmarks used can be questioned.

KLD data is defined as the research standard for measuring CSP. A single net score is commonly

used.



How is Environmental Performance Approached?



What are the Hypotheses?

Hypothesis 1: Environmental performance metrics are highly

related

Hypothesis 2: Environmental industry risk is positively related

to

al performance



What are the Aggregate Environmental Metrics Used in This Study?

- ▶ **KLD Research & Analytics ratings**
 - ▶ Environmental strengths
 - ▶ Environmental concerns
- ▶ **GES Investment Services risk ratings**
 - ▶ Industry-specific environmental risk
 - ▶ Company-specific environmental performance index
- ▶ **ASSET4 ratings**
 - ▶ Environmental pillar
 - ▶ Total CO2 emissions and size-adjusted CO2 emissions



Sample: 480 *MSCI U.S. World* companies 2003-2008

Method: convergent validity approach, univariate test and multivariate panel data analysis

Convergent Validity of Environmental Metrics

Correlation Matrix

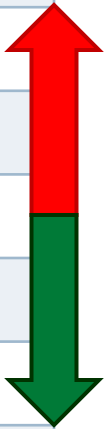
	KLD-Str	KLD-Con	GES-Industry	GES-Index	A4-Pillar	Log A4-CO2
KLD-Str	1.00					
KLD-Con	0.41	1.00				
GES-Industry	0.33	0.57	1.00			
GES-Index	0.60	0.46	0.47	1.00		
A4-Pillar	0.54	0.45	0.37	0.73	1.00	
Log A4-CO2	0.09	0.67	0.64	0.28	0.22	1.00

Note: untabulated Spearman rho's correlation coefficients are very similar with Pearson correlation coefficients

Consistency of Environmental Metrics Across Companies in Different Industries

Univariate Tests

	KLD-Str	KLD-Con	GES-Index	A4-Pillar
High GES Env-Industry Risk (rated \geq 5)				
High Risk Mean	0.79	1.72	2.28	0.56
Overall Mean				
Overall Mean	0.37	0.57	1.32	0.42
Low GES Env-Industry Risk (rated \leq 1)				
Low Risk Mean	0.09	0.09	0.49	0.31
T-test Mean diff	0.70 (21.74) ^{***}	1.63 (37.30) ^{***}	1.79 (29.17) ^{***}	0.25 (21.12) ^{***}
Wilcoxon Ran-Sum Test z-stat	21.78 ^{***}	31.22 ^{***}	25.37 ^{***}	19.18 ^{***}



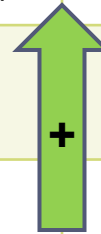
Consistency of Environmental Metrics

Multivariate Tests (Fixed Effects Model)

Variable	Linear Panel Data Regressions		
	GES Env-Index	A4 Env-Pillar	KLD Env-Str
Intercept	0.44 ^{***} (6.38)	0.32 ^{***} (28.53)	0.004 (0.11)
KLD Env-Str	0.20^{***} (4.15)	0.04^{***} (4.86)	
KLD Env-Con	0.14^{***} (2.28)	0.01 (0.38)	0.20^{***} (3.83)
A4 Env-Pillar	1.32^{***} (8.77)		0.27^{***} (3.86)
GES Env-Index		0.07^{***} (10.20)	0.06^{***} (4.24)
Adj. R ²	0.71	0.67	0.42
LM(BP)	48.29 ^{***}	25.05 ^{***}	902.93 ^{***}
Hausman	434.11 ^{***}	115.73 ^{***}	66.79 ^{***}
Mean VIF	1.43	1.64	1.85
Num. Obs.	2008	2070	1975

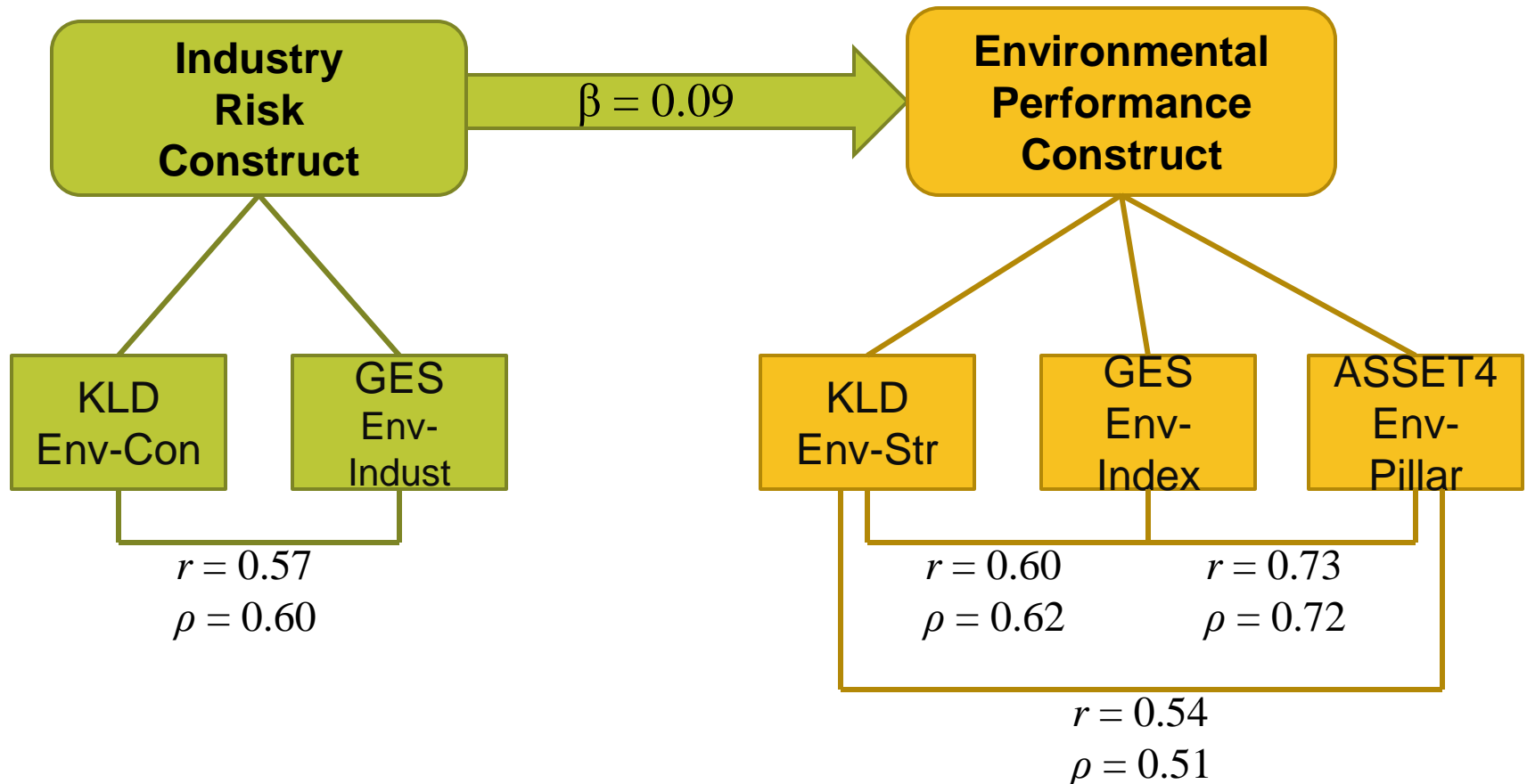
Industry Risk Drives Corporate Environmental Performance

	GES Env-Index			
	Fixed Effects Model	Fixed Effects Model	Pooled OLS	Pooled OLS
Intercept	-6.80 ^{***} (-6.45)	-6.64 ^{***} (-6.52)	-1.84 ^{***} (-3.16)	-0.89 ^{**} (-1.72)
GES Env-Industry	0.09^{***} (3.59)	0.08^{***} (3.26)		
KLD Env-Con			0.71^{***} (18.06)	0.70^{***} (17.84)
LnTA	0.47 ^{***} (7.47)	0.47 ^{***} (7.48)	0.15 ^{***} (4.37)	0.10 ^{***} (3.22)
ROA	2.21 ^{***} (2.73)		5.09 ^{***} (3.18)	
ROE		0.14 ^{**} (1.94)		0.11 (0.53)
Adj. R ²	0.14	0.11	0.30	0.29
LM(BP)	129.02 ^{***}	119.44 ^{***}	0.22	0.38
Hausman	88.76 ^{***}	90.72 ^{***}		
Num. Obs.	2340	2349	2273	2290



What did We Learn?

Summary



What Should We Conclude?

- ▶ **KLD, GES, ASSET4** ratings do a **consistent** job of aggregating an underlying environmental performance construct.
- ▶ **KLD** environmental strengths and KLD environmental concerns **do not converge** on the same construct.
- ▶ **Industry** risk and concerns **drive** environmental performance measures.

Semenova (2010)

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Literature

1. Chatterji, A., Levine, D., Toffel, M., 2009. How well do socially ratings actually measure corporate social responsibility? *Journal of Economics and Management Strategy* 18 (1), 125-169.
2. Entine, J., 2003. The myth of social investing. *Organization & Environment* 16 (3), 352-368.
3. Ilinitch, A., Soderstrom, N., Thomas, T., 1998. Measuring corporate environmental performance. *Journal of Accounting and Public Policy* 17, 383-408.
4. Margolis, J., Elfenbein H., Walsh, J., 2007. Does it pay to be good? A meta-analysis and direction of research on the relationship between corporate social and financial performance. Working Paper. Harvard University.
5. Mattingly, J., Berman, S., 2006. Measurement of corporate social action. Discovering taxonomy in the Kinder Lydenburg Domini ratings data. *Business & Society* 45 (1), 20-46.
6. Schäfer, H., Beer, J., Zenker, J., Fernandes, P., 2006. Who is who in corporate social responsibility rating. A survey of internationally established rating systems that measure corporate responsibility. Bertelsmann Foundation and University Stuttgart.
7. Sharfman, M., 1996. The construct validity of the Kinder, Lydenberg & Domini social performance ratings data. *Journal of Business Ethics* 15, 287-296.

Appendix

KLD Environmental Ratings (www.kld.com/research/index)

- ▶ **KLD environmental strengths:** beneficial product and services; pollution prevention; recycling; clean energy; management systems; property, plant, and equipment; other strengths.
- ▶ **KLD environmental concerns:** hazardous waste; regulatory problems; ozone depleting chemicals; substantial emissions; agricultural chemicals; climate change; other concerns.
- ▶ Scale: binomial with values either 0 (bad performance) or 1 (good performance). Period: 1991 – 2008. F once a year. Sample: 5660 U.S. companies.



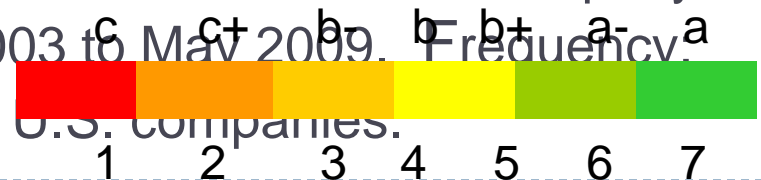
Appendix

GES Environmental Ratings (www.ges-invest.com)



- ▶ **General environmental industry risk**
- ▶ **Company-specific environmental risk**
 - Environmental preparedness – environmental management systems, environmental policy, ISO EMAS certification, reporting, training of employees, screening of suppliers
 - Environmental performance – energy use, waste treatment, GHG and VOC emissions, energy efficiency, product performance

- ▶ Scale: a seven-point non-numerical scale from Aa to Cc (capital letters indicate industry risk; lower case letters indicate company-specific risk). Period: December 2003 to May 2009. Frequency: twice a year. Sample: 5867 U.S. companies.



Appendix

ASSET4 Environmental Ratings (www.asset4.com)

- ▶ **Environmental pillar** measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capture environmental opportunities in order to generate long-term shareholder value.
 - ▶ **Resource reduction category**
 - ▶ **Emission reduction category**
 - ▶ **Product innovation category**
- ▶ Scale: a numerical scale from 100% (good performance) to 0% (bad performance). Period: 2002-2008. Frequency: once a year.
- ▶ Sample: 2310 U.S. companies.

