

Does the stock market fully value environmental performance?

Evidence from top 100 green companies in the U.S.

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This study analyzes the impact of environmental performance on stock returns. Using a portfolio of the “Top 100 Green Companies in the U.S.”, we find the evidence that high levels of corporate environmental management lead to long-run abnormal stock returns. This study have 3 implications. First, this paper support the view that corporate environmental management benefit shareholders. Second, stock market fails to incorporate environmental performance fully into stock valuations. Third, socially responsible investing (SRI) screens can improve investment returns.

Situations

- Increasing attention toward corporate environmental management in US firms’ operation
 - More than 300 US firms published annual CSR reports (CorporateRegister.com)
 - \$3.07 trillion is invested in SRI funds in 2009, up from \$2.16 trillion in 2003 (2010 report from Social Investment Forum)
- Growing academic research which identifies the relation btw corporate environmental management and firm performance
 - Klassen and McLaughlin (1996), Jawahar and McLaughlin (2001), Freeman, Wicks and Parmar (2004), Godfrey, Merrill, and Hansen (2009)
- However, previous studies on the relation between corporate environmental management and financial performance suffer *potential reverse causality problems* that well-performing firms usually expand investments in CSR activity with slack resources
 - McGuire, Sundgren, and Schneeweis (1988), Waddock and Graves (1997)

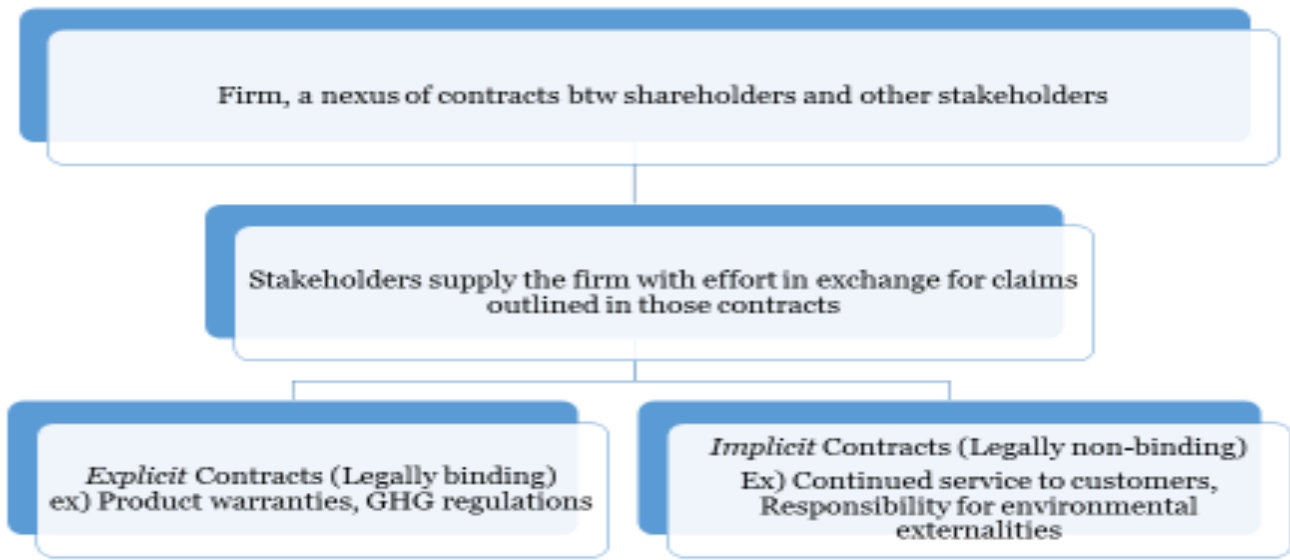
Research Questions

- Does the corporate environmental management generate long-run abnormal stock returns?
- Does the stock market fully value environmental performance?

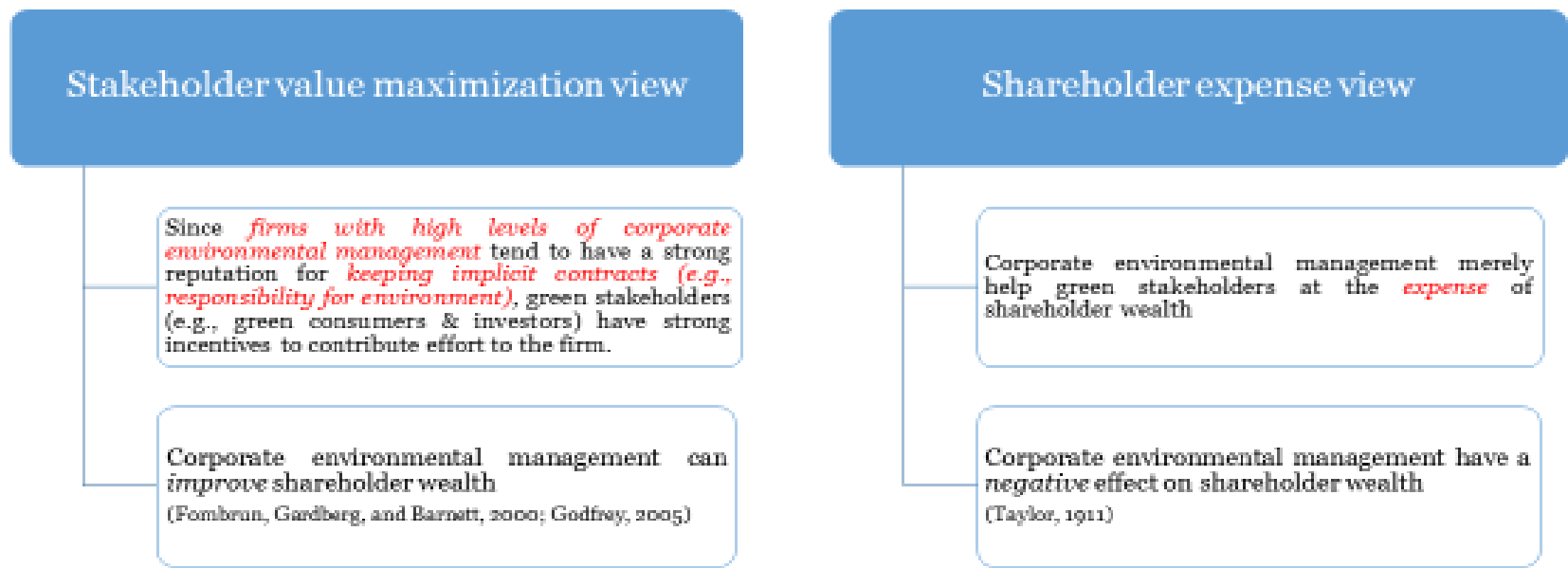
Main Findings

- Firms with high levels of corporate environmental management generate superior long-horizon shareholder returns.
- Market fails to incorporate environmental performance (which is one of intangible assets) fully into stock valuations.
- Therefore, certain socially responsible investing (SRI) screens (e.g., environmental screening) may improve investment returns.

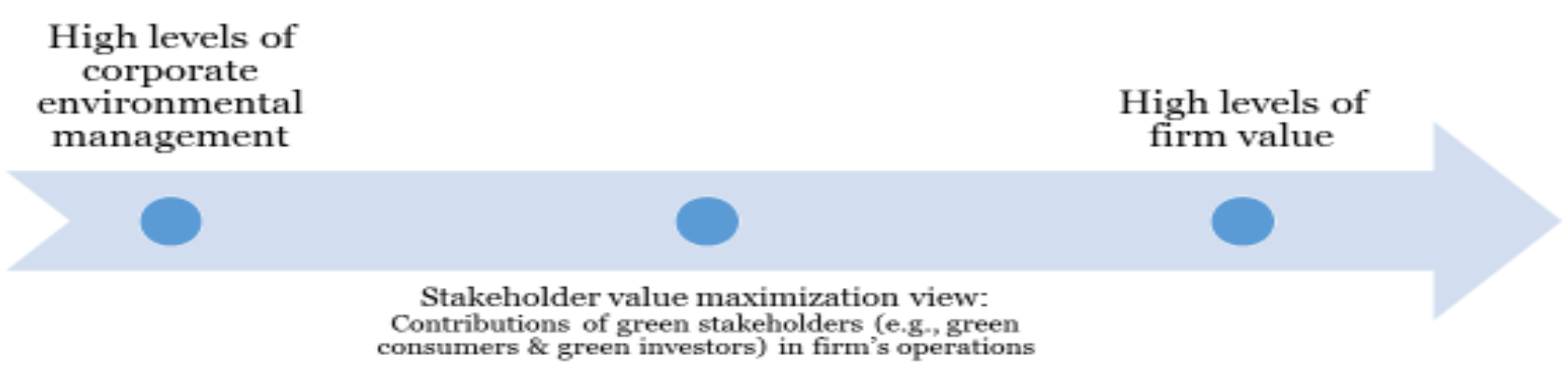
Hypothesis Development: Brief review on the theory of the firm



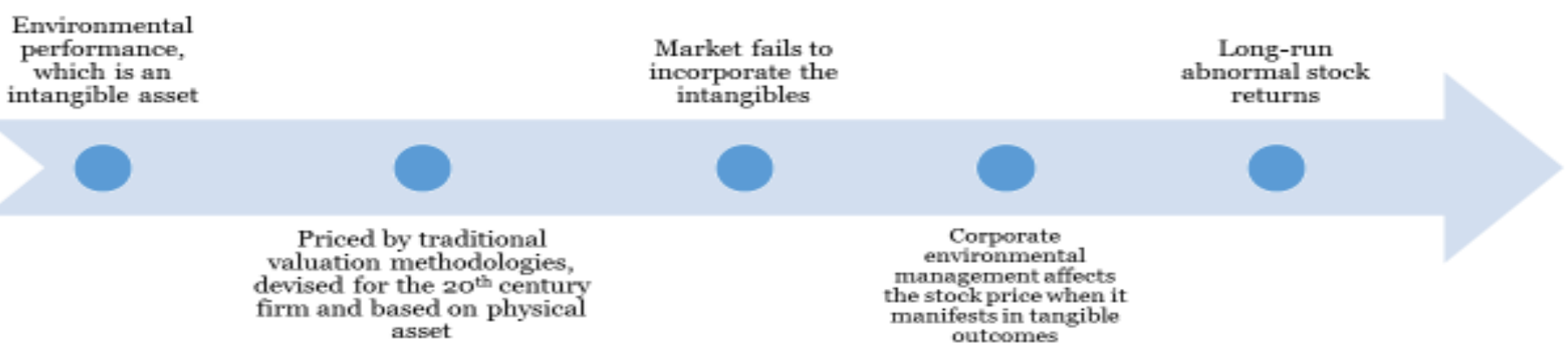
Hypothesis Development: Stakeholder value maximization view VS Shareholder expense view



Hypothesis Development: Corporate environmental management & firm value



Hypothesis Development: Underpricing of environmental performance



Data

Long-run(2009-2014) monthly stock returns of “Top 100 Green Companies in the U.S.”

Three Logical basis

Widely respected and highly publicized survey on corporate environmental management

Low reverse causality issues than profits and valuation ratios

Direct link to shareholder value

TECH & SCIENCE 2015 NEWSWEEK GREEN RANKINGS

	Logo	Name	Green Score (%)
1		Biogen Inc.	89.2
2		Allergan	84.2
3		Abbott	82.6
4		Broadcom Corporation	81.3
5		Novartis	81.3
6		Hershey's	78.7
7		Ecolab	77.8
8		Coca-Cola Enterprises	75.2

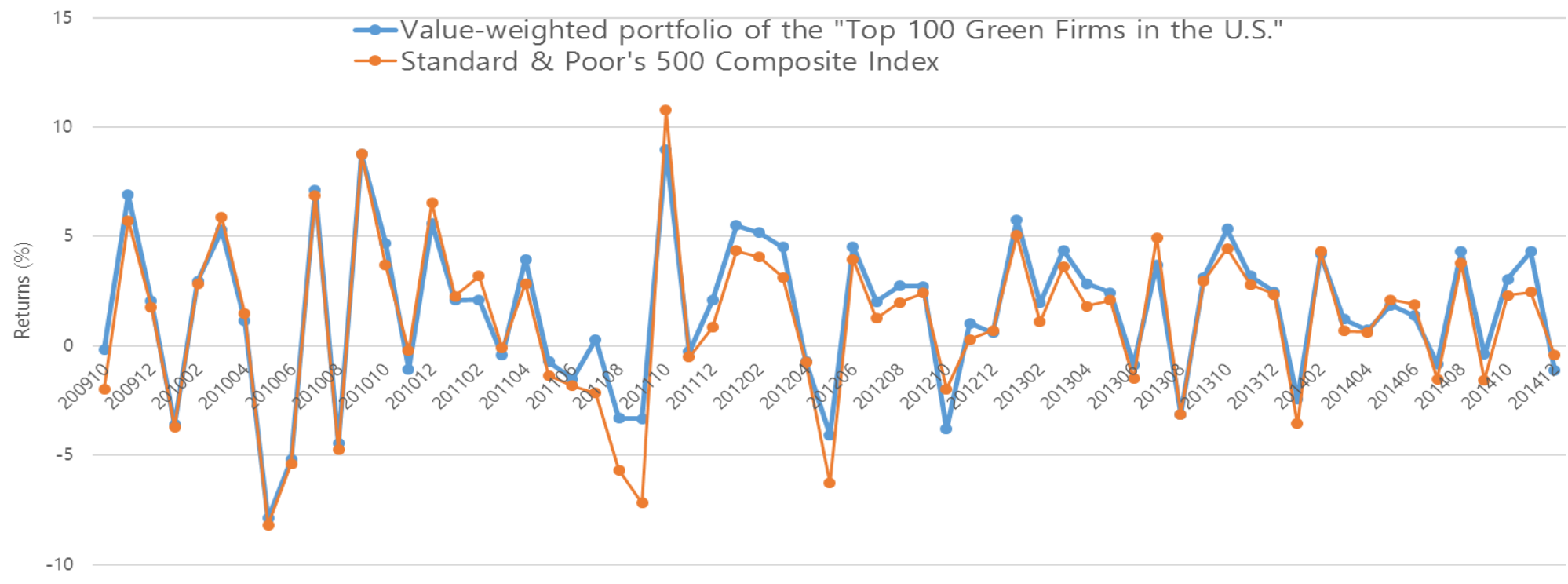
Methodologies

Using Carhart(1997) four factor model, find the excess risk-adjusted return α s.t.
 $R_t = \alpha + \beta_{MKT}MKT_t + \beta_{HML}HML_t + \beta_{SMB}SMB_t + \beta_{MOM}MOM_t + \epsilon_{it}$

where R_t is one of followings

- Excess return over risk free rate
- Excess return over industry-matched portfolio (Fama and French, 1997)
(available at Ken French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)
- Excess return over characteristics-adjusted portfolio, which matches size, book-market ratio, and momentum (Daniel, Grinblatt, Titman, and Wermers, 1997)
(available at Wermers' website: <http://alex2.umd.edu/wermers/fpsite/Dgtw/coverpage.htm>)

Monthly Returns of Green Portfolio and S&P's 500 Index



	Green Portfolio	S&P 500 Index	Differences
Mean (%)	1.587	1.132	0.455*** (3.713)
t-Statistics are in parentheses; *: Significant at 10% level; **: Significant at the 5% level; ***: Significant at the 1% level.			

Monthly Excess Returns of Green Portfolio



	Excess returns of green portfolio over the risk-free rate	Excess returns of green portfolio over the industry-matched portfolio return
Mean (%)	1.561*** (3.929)	0.400 (1.216)
t-Statistics are in parentheses; *: Significant at 10% level; **: Significant at the 5% level; ***: Significant at the 1% level.		

Table 1 Monthly regressions of returns to a value-weighted portfolio of the “Top 100 Green Companies in the U.S.” on the four Carhart (1997) factors, MKT, SMB, HML, and MOM.

	Excess returns over		
	Risk-free	Industry	Characteristics
α	0.47*** (3.34)	0.67*** (2.98)	0.22* (1.89)
β_{MKT}	0.86*** (19.65)	-0.20*** (-3.61)	0.01 (0.56)
β_{SMB}	-0.27*** (-4.95)	-0.68*** (-6.35)	-0.11** (-2.49)
β_{HML}	-0.22** (-2.16)	-0.05 (-0.44)	-0.16** (-2.38)
β_{MOM}	-0.10* (-1.84)	0.11 (1.28)	-0.02 (-0.32)
Observations	63	63	39

t-Statistics are in parentheses; *: Significant at 10% level; **: Significant at the 5% level; ***: Significant at the 1% level.

Table 1 Monthly regressions of returns to an equal-weighted portfolio of the “Top 100 Green Companies in the U.S.” on the four Carhart (1997) factors, MKT, SMB, HML, and MOM.

	Excess returns over		
	Risk-free	Industry	Characteristics
α	0.12 (0.91)	0.44*** (2.73)	-0.02 (-0.16)
β_{MKT}	1.01*** (20.31)	0.08* (1.68)	0.09** (2.62)
β_{SMB}	0.06 (0.88)	-0.92*** (-10.68)	0.12* (1.76)
β_{HML}	-0.24* (-1.85)	-0.42*** (-3.08)	-0.25** (-2.46)
β_{MOM}	-0.14 (-1.33)	-0.09 (-1.08)	-0.11 (-1.46)
Observations	63	63	39

t-Statistics are in parentheses; *: Significant at 10% level; **: Significant at the 5% level; ***: Significant at the 1% level.

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