SRI[1] and CSR[2] : How are they linked ?[3]

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Summary

It is quite popular to characterize the impact of SRI on CSR in the following simple way: SRI Funds exclude stocks of corporations that fail "screens" for CSR and in excluding these stocks, force up the cost of capital of the respective irresponsible corporations; the higher cost of capital in turn reduces the investment and "footprint" of the affected corporations, or alternatively it induces them to expend resources to "clean up their act."

I argue that this hoped-for impact of SRI on CSR is likely weak or non-existent. On the empirical side, there is no evidence that even the focused anti-apartheid boycotts of South Africa-related stocks in the 1970s and 1980s had any effect. On the theoretical side, common equilibrium investor demand models with reasonable parameters predict little effect, and on the security supply side, real-world corporate financing is much more complex than envisaged in the simple SRI-CSR link. Perhaps most important, if SRI were successful in forcing down the stock prices of target companies, and thus forcing up their costs of capital, it would *ipso facto* result in a lower expected return on the SRI funds than on market portfolios of all stocks. I show how to construct an SRI fund so as to minimize this expected underperformance by selecting the fund holdings to match the factor exposures of a benchmark market portfolio of all stocks, but the performance gap cannot be eliminated.

I argue for a realistic definition of CSR, viz. that "responsible" corporations are those that are more innovative in technology and/or have cleverer managerial strategy or marketing that enables them to turn situations that involve trade-offs between private gain and social cost into "win-win" situations of private gain and

social gain (or reduction in social cost). CSR in this sense simply becomes one more input into corporate decision-making, and CSR policies in this sense end up leveraging the most powerful corporate incentives to solve society's problems - note that our definition of "clever management" includes lobbying for more effective rules and regulations, which may be controversial. Those private incentives then create a new and more interesting linkage between SRI and CSR: if SRI Funds can identify CSR companies ahead of "the" (stock) market and support the CSR companies' decision-making, the Funds can expect higher returns than those on a market basket of stocks. I discuss a framework for future empirical work to identify CSR stocks that meet my definition.

1. Introduction

Even as the Social Investment Forum reports that "socially and environmentally responsible investing" has come to account for over 11% of professionally managed U.S. assets, there appears to be increasing unease that socially responsible investment (SRI) and corporate social responsibility (CSR) have not quite lived up to their ideal. For example, in a detailed analysis of the holdings of SRI mutual funds world-wide, Hawken et. al. (2004) conclude tha "the cumulative investment portfolio of the combined SRI mutual fund industry is virtually no different than the combined portfolio of conventional mutual funds**...**the screening methodologies and exceptions employed by most SRI mutual funds allow practically any publicly-held corporation to be considered as an SRI portfolio company" (p. 16)[4]. In Japan, SRI ("Eco") Funds largely came and went in the 1990s as their returns substantially under-performed the market. My own research suggests that U.S. SRI mutual fund inflows and outflows respond to past monetary returns in much the same way as those of mutual funds in general - that is, there is no added investor "stickiness" associated with the principle behind the funds. With respect to CSR, the recent Economist Special Survey (2005) suggests that: "…… CSR takes many different forms and is driven by many different motives. But …… for most companies, CSR does not go very deep" (p. 4). In this paper, I will define CSR as managerial "innovativeness" in transforming private gain-social cost situations into "win-win" propositions. My working concept is surely more limited than the ideal envisaged by many commentators and may not even "go very deep," but I try here to make it operational and link it to SRI.

A typical perception of SRI, or at least its ideal, is that it induces CSR via the capital market mechanism as SRI funds exclude the stocks of delinquent companies from their holdings and so exert downward "pressure" on the prices of those companies' stocks. All else equal, the lower stock price means a higher cost of capital, leading to lower levels of real investment, output and thereby negative externalities. Alternatively, the target companies would respond by incurring abatement costs if those costs are below the penalty imposed by the higher cost-of-capital. It has never been very plausible that significant results could be achieved via this mechanism, however, especially for larger companies. First, if SRI Funds that under-weight or even short the stocks of non-CSR companies are successful in driving up those respective companies' cost of capital, the Funds' expected risk-adjusted monetary returns will be lower than those on an index fund of all stocks. In a frictionless market (where externalities may admittedly not be a problem in the first place), the bundle of the SRI investor's non-monetary "warm feeling" plus the lower monetary expected return will equal the expected return on the index of all stocks. But I've seen no SRI fund literature pointing out that SRI investors might be expected to under-perform conventional benchmarks[5]. I show in Section 2 that it is possible to design an efficient SRI portfolio that in fact minimizes underperformance, but so long as SRI funds simply exclude undesirable stocks with no other information, the performance gap can at best be minimized, not eliminated. Second, there are multiple sources of corporate financing, including internal funds. Even if SRI efforts were successful, they would simply raise the cost of external equity financing which many corporate finance specialists believe to be last in the pecking order for funds[6]. Third, the finance research literature has consistently failed to detect any impact of non-company-specific shareholder actions on equity pricing. For example, Teoh, Welch, and Wazzan's (1999) post mortem of the pension fund divestments of the stocks of U.S. firms and banks doing business in South Africa in the 1970s-1980s concluded that the announcements of events leading up to the divestments had no discernable impact on the prices of the target stocks — these anti-apartheid-motivated actions were almost certainly bigger in scale and more focused than the collective actions of the SRI funds[7].

In Section 2, I provide a real-world example showing why non-informational SRI fund activity should have so little effect, and conversely how the negative performance impact on an SRI fund's returns can be minimized. I show that, with real-world parameters and especially with the common factor exposures of stocks observed in the real world, both SRI investors and the counter-party investors who must absorb the stocks shunned by the SRI

investors can construct portfolios with minimal predicted tracking error vis-à-vis a benchmark of all stocks held in their（partial equilibrium）market weights. The example is consistent with the general equilibrium analysis of Heinkel, Kraus, and Zechner（2001）who conclude that with plausible parameters, SRI investments would need to account for 20% or more of holdings in the respective target companies to begin to have an impact on those targets' costs of capital.

In Section 3, I focus on CSR. I take the corporate context to be the "messy" real-world context with incompleteness and uncertainty in day-to-day operations and strategic decision-making - incomplete markets that give rise to the externalities, incompleteness and thus uncertainty and inconsistency in regulations, and incompleteness in incentive compensation contracts at all levels of the corporation. Given this imperfect world, I define CSR to simply mean "innovativeness" in improving the private gain-social cost tradeoff. It might seem naïve to define CSR in this way. For example, in Coase's original example of the sparks from English trains creating an externality by setting on fire the fields adjacent to the tracks, I am defining CSR at the train company to be innovativeness in finding ways to harness the energy in the errant sparks and so eliminate them as part of the private gain in energy saving; if instead of saving energy, the train company management incur costs to eliminate the sparks and then can promote a safer, more reliable, train service, that is CSR in my definition. If train management eliminate the sparks and then be part of an "innovative" regulation that prevents competitors from using the same tracks except say during periods of rain, this may also fall with the scope of "doing well by doing good."

I understand that this definition of CSR makes it a much less ambitious endeavor than the "solve all ills" ideal. There is still scope for informed, multi-faceted regulation with its own pluses and minuses, and there will be instances where, no matter how ingenious and well-run the company, there is simply no miracle of technology that eliminates the social externality in the short run. In this case, the "divide and conquer" approach might be a regulatory limit on, say carbon emissions, combined with trading in carbon emissions on exchanges such as the European Climate Exchange in Amsterdam, in U.N. pollution certificates, etc. Here the scope for innovating win-win solutions extends spans the technologies of multiple corporations.

There is the possibility that "……[m]ost CSR …… is probably delusional, meaning that

it reduces both profits and social welfare ……” (Economist, p. 8). Here is where I link back to SRI ： an SRI fund manager who can successfully identify innovative corporate management - in all respects, including what I have called CSR - ahead of other stock market investors will reap the rewards of these “alphas,” as will the investors. It may seem that I have now compounded the naivety, requiring ingenious investment managers to find the ingenious corporations. But considerable knowledge and expertise is required to identify corporations capable of these innovations, and strong private incentives on average attract those fund managers; unfortunately, it will also attract the less skilled, and I know that it can be difficult to assess fund manager performance, even with *ex post* returns.

Derwall, Guenster, Bauer, and Koedijk (2005) have recently argued that the stocks of companies with high rankings on a score of “eco-efficiency” by Innovest outperform low ranked stocks. This study is carefully done and the Innovest rankings appear among the best available, but I argue that the returns and rankings can be equally well interpreted as a proxy for innovativenss in using technology to create win-win solutions along dimensions that appear quite different to those used in the Innovest scores. I provide empirical measures, along valuation dimensions, for CSR-innovation, and argue that it provides results at least as strong as those in the Derwall et al paper.

Section 4 contains a summary and concluding comments.

2. Excluding Socially Undesirable Stocks from an Investor's Portfolio

In this section I consider an investor who has no “alpha” or other market timing information about stocks, but simply excludes stocks that he or she considers socially undesirable from the portfolio. For an example here, I assume that the excluded stocks are those classified as being in the Energy, Tobacco, Chemicals, Forest Products and Paper, and Mining and Metals Industries (defined using the Dow Jones Global Classification Standard).

The investor does not want to bet for or against the market, here the Dow Jones U.S. index, in constructing this hypothetical SRI portfolio subject to the exclusion restrictions, since he or she has no special timing information about market ups and downs. Alternatively, the manager of the fund in which the investor puts his or her money is an

agent of the investor - if it is difficult for the investor to monitor the fund manager's abilities, qua agent, the manager has an incentive to neutralize any increased or decreased "market exposure" as a result of the stock exclusion. How would the manager do this? Intuitively, since the fund cannot hold, say, energy stocks, it would like to increase the weight in stocks that behave like energy stocks. For example, airline stocks tend to go down when energy stocks go up, so an underweight or short position in airline stocks will substitute, albeit imperfectly, for energy stocks. A more general basket of stocks that respond to the same factors as energy stocks will be a more perfect substitute, etc.

As an example, an SRI portfolio has been constructed which excludes stocks in the industries cited above. Out of the 1620 stocks in the Dow Jones U.S. Index, this portfolio contains 1293 stocks, although small positions could be eliminated to reduce the number of stocks with little give-up in risk-adjusted return on the portfolio. The forecasted tracking error for the SRI portfolio is 73 basis points - this can be considered quite "tight" vis-à-vis typical index tracking funds. Both the Index and portfolio had identical forecasted volatilities, 14.8%. The point estimate for the beta of the portfolio with respect to the Index is 0.98, i.e. subject to a standard error, the portfolio is forecasted to move up or down in lock-step with the Index.

The portfolio is shown in Figure 2. Note first that the portfolio weights for the excluded industries are in fact zero - energy is by far the largest component of the Index with a 6.04% weight, so the portfolio is underweight by 6.04%. Notice also that the stocks that are overweight, relative to the Index, are in the banks, real estate, and utilities industries. The overweight position in banks and real estate may initially seem puzzling (though perhaps not, since all three have moved together with energy since I prepared the case study). The portfolio is over-weighting the utilities to substitute for the excluded energy stocks and then including banks and real estate to offset the interest rate exposure from the overweight utilities.

The first column in Figure 3 shows the sensitivity ("exposure") of the Index to each industry, while the third column shows the sensitivity of the optimal SRI portfolio. Notice, for example, that although all stocks that are classified as Energy stocks have been excluded from the portfolio, the portfolio's exposure to Energy is 0.5583 (i.e. I expect the Index to move up or down by approximately 56 basis points when Energy stocks experience a 100

Figure 1

DJIQ - α8
File Tools Help
All Indexes
Dow Jones U.S. Indexes
DowJonesGlobalClassificationStandard-U.S.Indexes
Basic Materials
Basic Resources
Forest Products & Paper
Mining & Metals
Chemicals
Chemicals
Consumer, Cyclical
Consumer, Noncyclical
Food & Beverage
Noncyclical Goods & Services
Consumer Services
Cosmetics
Food Retailers & Wholesalers
Household Products
Tobacco
Energy
Financial
Healthcare
Industrial
Technology
Telecommunications
Utilities
All Indexes
Dow Jones U.S. Indexes
Dow Jones Global Indexes
Dow Jones STOXX Indexes
Dow Jones Titans Indexes
Dow Jones Islamic Market Indexes
Dow Jones Sustainability Indexes
Specialty Indexes
Exchange-Traded Funds
Portfolio
Benchmark
Universe
Parameter
Optimized Portfolio

Figure 2

Total Distribution by Industry

	Industry	Portfolio	Bench...	Differen...
1	Energy	.00%	6.04%	-6.04%
2	Chemicals	.00%	1.40%	-1.40%
3	Tobacco	.00%	1.04%	-1.04%
4	Mining & Metals	.00%	.47%	-.47%
5	Forest Products & Paper	.00%	.46%	-.46%
6	Software	4.40%	4.81%	-.41%
7	Biotechnology	1.62%	2.02%	-.40%
8	Pharmaceuticals	7.81%	8.07%	-.26%
9	Semiconductors	4.28%	4.48%	-.20%
10	Fixed-Line Communications	3.46%	3.65%	-.19%
11	Communications Technology	2.35%	2.42%	-.07%
12	Automobile Manufacturers	.48%	.51%	-.03%
13	Broadcasting	3.19%	3.22%	-.03%
14	Technology Hardware & Equipment	3.49%	3.51%	-.03%
15	Airlines	.25%	.25%	-.01%
16	Entertainment	.20%	.21%	-.01%
17	Food Retailers & Wholesalers	.73%	.71%	.03%
18	Wireless Communications	.42%	.39%	.03%
19	Technology Services	.61%	.58%	.03%
20	Healthcare Providers	1.34%	1.30%	.04%
21	Heavy Construction	.13%	.07%	.06%
22	Water Utilities	.11%	.05%	.06%
23	Beverage	2.46%	2.39%	.07%
24	Consumer Services	.66%	.58%	.08%
25	Advertising	.45%	.37%	.08%
26	Medical Products	2.40%	2.29%	.11%
27	Textiles & Apparel	.45%	.33%	.13%
28	Electric Components & Equipment	.74%	.60%	.14%
29	Industrial Equipment	.45%	.30%	.15%
30	Auto Parts & Tires	.60%	.44%	.16%
31	Advanced Industrial Equipment	.68%	.52%	.16%
32	Cosmetics	.90%	.74%	.16%
33	Diversified Financial	5.44%	5.27%	.16%
34	Food	1.54%	1.37%	.17%
35	Industrial Transportation	1.50%	1.31%	.19%
36	Securities Brokers	2.17%	1.98%	.20%
37	Aerospace	1.54%	1.33%	.21%
38	Publishing	.97%	.76%	.21%
39	Building Materials	.47%	.26%	.21%
40	Containers & Packaging	.44%	.22%	.22%
41	Home Construction & Furnishings	.66%	.41%	.25%
42	Retail	7.28%	6.98%	.30%
43	Household Products	1.89%	1.58%	.31%
44	Leisure Goods & Services	2.10%	1.77%	.33%
45	General Industrial Services	2.58%	2.24%	.34%
46	Gas Utilities	.57%	.14%	.44%
47	Industrial Diversified	5.75%	5.08%	.67%
48	Insurance	4.81%	3.99%	.82%
49	Real Estate	2.42%	1.15%	1.28%
50	Electric Utilities	4.39%	2.81%	1.58%
51	Banks	8.81%	7.15%	1.66%

Figure 3

Total Risk Exposure by Industry

	Industry	Index Sensitivity	Old Sensitivity	New Sensitivity
1	Advanced Industrial Equipment	.4574	.0000	.4401
2	Advertising	.4065	.0000	.3911
3	Aerospace	.5794	.0000	.5575
4	Airlines	.3156	.0000	.3036
5	Auto Parts & Tires	.6117	.0000	.5885
6	Automobile Manufacturers	.2901	.0000	.2791
7	Banks	.8146	.0000	.7838
8	Beverage	.3157	.0000	.3038
9	Biotechnology	.4218	.0000	.4058
10	Broadcasting	.4160	.0000	.4002
11	Building Materials	.4989	.0000	.4800
12	Chemicals	.5219	.0000	.4993
13	Communications Technology	.2913	.0000	.2802
14	Consumer Services	.4606	.0000	.4432
15	Containers & Packaging	.5461	.0000	.5254
16	Cosmetics	.4088	.0000	.3934
17	Diversified Financial	.6253	.0000	.6016
18	Electric Components & Equipment	.4092	.0000	.3937
19	Electric Utilities	.6591	.0000	.6342
20	Energy	.5893	.0000	.5585
21	Entertainment	.2110	.0000	.2031
22	Fixed-Line Communications	.5440	.0000	.5234
23	Food	.4329	.0000	.4166
24	Food Retailers & Wholesalers	.4539	.0000	.4367
25	Forest Products & Paper	.4638	.0000	.4448
26	Gas Utilities	.7925	.0000	.7625
27	General Industrial Services	.8543	.0000	.8220
28	Healthcare Providers	.4089	.0000	.3936
29	Heavy Construction	.3110	.0000	.2992
30	Home Construction & Furnishings	.4880	.0000	.4695
31	Household Products	.3718	.0000	.3577
32	Industrial Diversified	.4155	.0000	.3998
33	Industrial Equipment	.4673	.0000	.4496
34	Industrial Transportation	.7158	.0000	.6887
35	Insurance	.6956	.0000	.6692
36	Leisure Goods & Services	.8432	.0000	.8112
37	Medical Products	.5729	.0000	.5512
38	Mining & Metals	.3710	.0000	.3550
39	Pharmaceuticals	.5717	.0000	.5500
40	Publishing	.9217	.0000	.8868
41	Real Estate	1.5927	.0000	1.5326
42	Retail	.7428	.0000	.7146
43	Securities Brokers	.4375	.0000	.4210
44	Semiconductors	.2798	.0000	.2692
45	Software	.4216	.0000	.4056
46	Technology Hardware & Equipment	.4306	.0000	.4143
47	Technology Services	.3973	.0000	.3823
48	Textiles & Apparel	.4594	.0000	.4421
49	Tobacco	.1695	.0000	.1560
50	Water Utilities	.7247	.0000	.6973
51	Wireless Communications	.1556	.0000	.1497

basis point move). In general, the exposures of the SRI portfolio across industries, excluded and included, look very similar to those of the Index.

3. Innovation and CSR

In the preceding section, I focused on investment strategies for SRI funds that exclude stocks of non-CSR companies that "do well by doing bad." In this section, I try to provide an operational definition of what I will mean by CSR, i.e. what it means for a company to

“do bad” or to “do good.” In the literature, CSR and associated concepts such as sustainability and responsibility for an (un-priced) environmental “footprint” appear to mean many things. However, it seems generally agreed and sensible that mere compliance with existing environmental laws and regulations, worker safety regulations, and the like not per se be considered CSR[8] .

For my purposes, I will regard CSR as innovation and “skilled” management-of-innovation by companies so as to improve the trade-off between private gain and social cost, i.e. as a process whereby negative externalities can be reduced by internalizing and reducing or eliminating them. I realize that in a world of perfect markets and uncertainty, this would be a trivial concept - indeed, in the limit, there would be no “tragedy of the commons” problem in such a world. In the perfect markets world, there is still a “resource cost” to production of course, but the cost is borne privately. My concept of CSR is relevant in the real world of market incompleteness, informational asymmetries, dynamic technology, uncertainty regarding environmental regulations, and incomplete executive compensation contracts, etc. --- in this world, management skill and innovative technology is consistent with CSR if it helps “solve” the externality problems by turning them into win-win situations.

The “win-win” terminology doesn't mean that the corporation and its shareholders will always be the winners of the private gain that accompanies the social gain. Indeed, the gains to the corporation and its shareholders will be short-lived if there is little impediment to competitive adjustment in the product market, supplier prices, and/or the employee market. For example, a technological break-through that dramatically reduces the cost of solar power generation or improves battery capacity would lead to substantially reduced carbon emissions (the social win), and it would result in a private “win” for consumers if the lower energy costs are passed along to consumers. Indeed, over long periods of time, the evidence is that the benefits of economic growth almost entirely accrue to consumers and employees rather than owners of capital[9] , e.g. Dimson, Marsh, and Staunton (2002, p 156) report that from 1900 - 2000, the correlation across countries between real returns on corporate equities and real per capita GDP growth is -0.27; since 1951, it is -0.03 (also Siegel (1998)). The short life of the “win” for the stockholders and managers as their agents is the incentive to keep them innovative. Moreover, the technology that is conducive to win-win keeps changing over time, e.g. when Henry Ford created a private win by introducing

the Model T, it was at that time literally hailed as “the end of pollution”-- a social win insofar as it substantially reduced pollution in the form of horse manure on city streets !

Defining CSR as the effort to transform social costs to a win-win proposition encompasses not only just smart ways to apply technology that save the environment or promote better conditions for employees while simultaneously saving money for the corporation, but also lobbying for new regulations and/or against old dysfunctional rules and regulations to (say) reduce environmental damage even if that is to the short-run gain of the lobbyist, etc. An example would be an electric utility that lobbies for regulation that enables the utility to gain if users invest in energy-saving appliances -- one way to do this would be higher electricity rates if they are held down by regulation; another way to reduce electricity usage would be make it incentive-compatible for the utility to mount a campaign to endogenize users' behavior and have them “feel good” in saving energy -- Reiss and White (2005) found that such campaigns were quite effective in reducing electricity demand in San Diego in 2001.

Again, I realize that I am far from the first to define CSR in terms of innovative management that “solves” environmental and social problems by, in essence, transforming them into priced resource problems where private incentives can operate. Wells (1994) argues along the same lines, and suggests that it is more of a management problem than a technological problem to find the complementarity between social and industrial performance. Lovins (2005) argues that technology to eliminate a substantial fraction of the Earth's fossil fuel emissions already exists, and most important that “……[I]f properly done, climate protection would actually reduce [private] costs not raise them. Using energy more efficiently offers an economic bonanza - not because of the benefits of stopping global warming but because saving fossil fuel is a lot cheaper than buying it” (p. 74).

To go into the concept of CSR in more depth, I consider four recent examples of what the press regards as CSR ：

(i) “Lord Browne of BP pledged to cut his oil company's emissions by 10 per cent from 1990 levels by 2010 - and announced in 2002 that it had achieved its goal eight years early. Moreover, there was no net cost because cutting emissions helped BP to use less energy.” (Financial Times, Friday July 1, 2005, p. 8) ;

(ii) “The reasoning behind the [Ecomagination] drive is clear: Mr. Immelt scents a business opportunity. 'Green is green,' he tells customers and investors, equating the green of the environment with the green of the dollar**...**If a customer were using old, environmentally unsound technology and were unwilling to invest in changing it, would GE try to persuade it otherwise? Mr. Immelt does not hesitate: 'Unlikely.” GE will not let its new-found environmental credentials to stand in the way of business.” (Financial Times, Friday July 1, 2005, p. 8) ；

(iii) “'When people think about fuel efficient vehicles they think about Toyota now, and that's a coup,' commented Rod Lache at Deutsche Bank in New York.”[10] (Financial Times, Tuesday September 20, 2005, p. 19) ；(Marketing: Branding ……)

(iv) “…… Mark Benioff['s] company encourages its staff to devote time, at the firm's expense, to charitable works …….. this draws the right kind of people to the firm - team players, joiners, volunteers, generous and committed colleagues with a sense of loyalty to the enterprise”(Economist, p. 8).

These are “win-win” examples of increased private profits AND increased social welfare. An investor in an SRI fund who could identify these stocks ahead of time and who could hedge out the risk of other events that could affect the stocks' prices would, all else equal, realize gains of his or her good-conscience investments.

But the “win-lose” example in the previous section where SRI Funds exclude stocks that are judged to be making private gain at social expense, together with these “win-win” cases, still don't exhaust all possibilities[11] . Several authors (e.g. Rugman and Verbeke (1998), Martin (2002), Economist (2005, p.8), propose variations of the following matrix of trade-offs ：[12]

	Raises social welfare	Reduces social welfare
Raises profits	Good management	Pernicious CSR
Reduces profits	Borrowed virtue	Delusional CSR

Figure 4

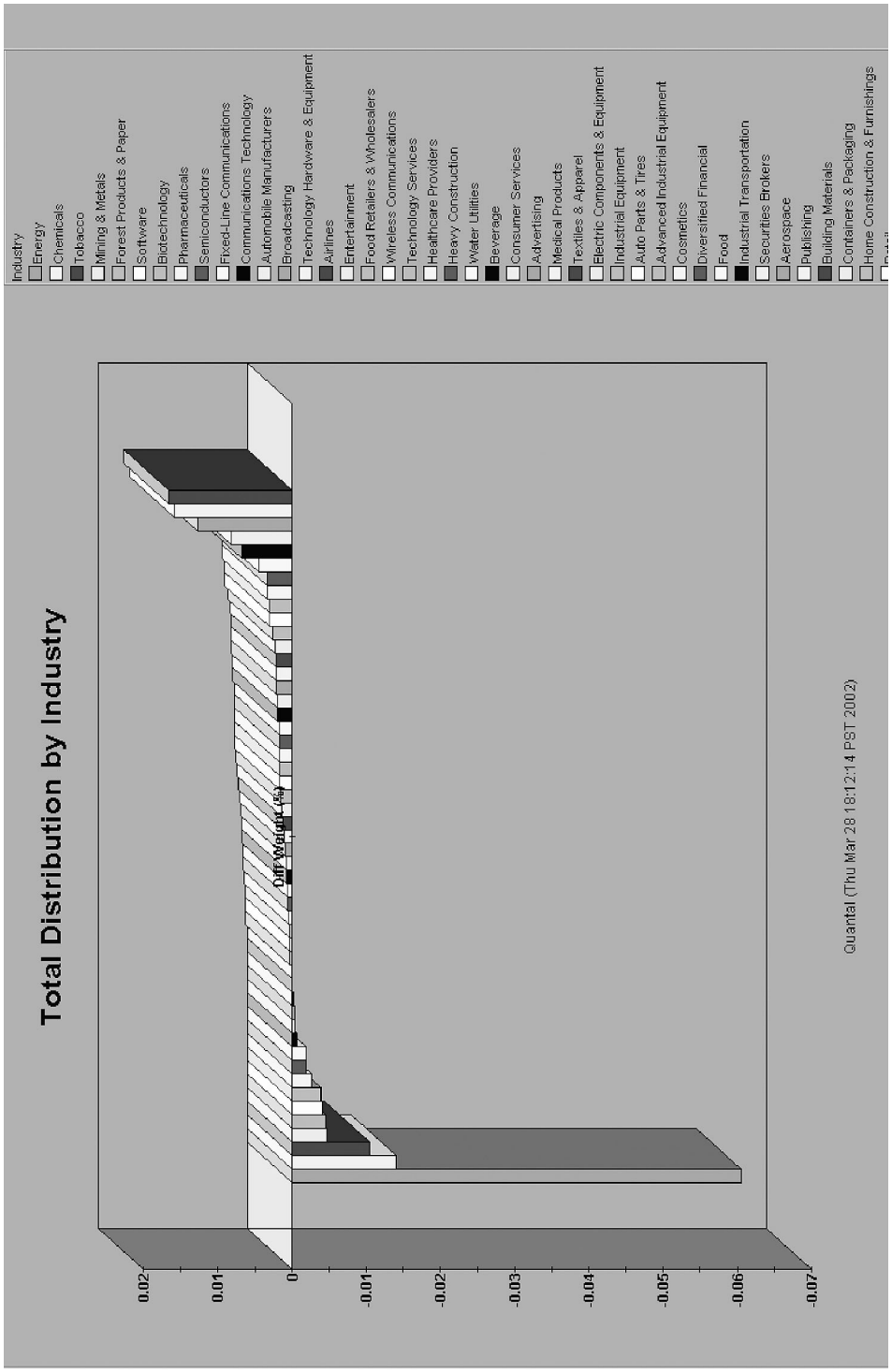
Total Risk Breakdown by Industry

	Description	PctPortfolio	PctBenchmark	PctActive
1	Advanced Industrial Equipment	1.79%	0.80%	-8.94%
2	Advertising	0.86%	0.48%	-3.63%
3	Aerospace	1.61%	0.97%	-5.72%
4	Airlines	0.24%	0.30%	0.81%
5	Auto Parts & Tires	0.97%	0.45%	-4.82%
6	Automobile Manufacturers	0.18%	0.56%	3.59%
7	Banks	7.67%	7.13%	0.09%
8	Beverage	0.66%	0.56%	-0.60%
9	Biotechnology	1.24%	2.21%	10.99%
10	Broadcasting	4.30%	4.24%	2.58%
11	Building Materials	0.63%	0.21%	-4.05%
12	Chemicals	0.00%	1.45%	18.43%
13	Communications Technology	4.85%	5.25%	7.65%
14	Consumer Services	0.56%	0.69%	1.47%
15	Containers & Packaging	0.78%	0.22%	-5.89%
16	Cosmetics	0.51%	0.24%	-2.50%
17	Diversified Financial	6.16%	6.14%	4.51%
18	Electric Components & Equipment	0.98%	1.03%	1.24%
19	Electric Utilities	2.27%	1.42%	-6.55%
20	Energy	0.00%	5.10%	69.90%
21	Entertainment	0.11%	0.23%	1.55%
22	Fixed-Line Communications	2.76%	3.20%	5.78%
23	Food	0.25%	0.29%	0.63%
24	Food Retailers & Wholesalers	0.43%	0.46%	0.74%
25	Forest Products & Paper	0.00%	0.52%	8.11%
26	Gas Utilities	1.29%	0.07%	-10.89%
27	General Industrial Services	2.05%	2.13%	2.48%
28	Healthcare Providers	0.26%	0.22%	-0.40%
29	Heavy Construction	0.49%	0.08%	-4.04%
30	Home Construction & Furnishings	0.58%	0.34%	-2.02%
31	Household Products	0.71%	0.63%	-0.47%
32	Industrial Diversified	6.32%	6.02%	1.58%
33	Industrial Equipment	1.26%	0.36%	-8.29%
34	Industrial Transportation	1.12%	1.05%	-0.91%
35	Insurance	3.39%	2.95%	-2.20%
36	Leisure Goods & Services	2.28%	1.57%	-6.10%
37	Medical Products	0.84%	0.88%	0.97%
38	Mining & Metals	0.00%	0.50%	7.58%
39	Pharmaceuticals	3.36%	3.34%	2.21%
40	Publishing	0.58%	0.45%	-0.82%
41	Real Estate	0.77%	0.40%	-4.28%
42	Retail	6.38%	5.60%	-3.83%
43	Securities Brokers	3.10%	3.26%	4.05%
44	Semiconductors	9.97%	10.53%	11.88%
45	Software	6.90%	7.95%	16.87%
46	Technology Hardware & Equipment	6.62%	5.59%	-5.85%
47	Technology Services	0.65%	0.80%	2.36%
48	Textiles & Apparel	0.37%	0.21%	-1.37%
49	Tobacco	0.00%	0.24%	7.85%
50	Water Utilities	0.09%	0.01%	-0.70%
51	Wireless Communications	0.79%	0.62%	-0.99%

The matrix portends a richer link between SRI and CSR than that envisioned in the previous section where the SRI Fund simply boycotts "dirty stocks." That is, SRI funds can potentially overweight "good management" CSR stocks at no loss in monetary returns, and indeed even enhance their monetary returns if they can identify such "win-win" stocks in advance of the market. It raises the prospect of an SRI Fund where the expectation does not have to be underperformance.

Case (iii) that involves the Toyota Prius, whose hybrid drive reduces un-priced carbon emission externalities, is an interesting one. Toyota could in principle use the perceived environmental friendliness of the Prius as a form of buyer self-targeting in its pricing deci-

Figure 5


Total Distribution by Industry
Industry
Energy
Chemicals
Tobacco
Mining & Metals
Forest Products & Paper
Software
Biotechnology
Pharmaceuticals
Semiconductors
Fixed-Line Communications
Communications Technology
Automobile Manufacturers
Broadcasting
Technology Hardware & Equipment
Airlines
Entertainment
Food Retailers & Wholesalers
Wireless Communications
Technology Services
Healthcare Providers
Heavy Construction
Water Utilities
Beverage
Consumer Services
Advertising
Medical Products
Textiles & Apparel
Electric Components & Equipment
Industrial Equipment
Auto Parts & Tires
Advanced Industrial Equipment
Cosmetics
Diversified Financial
Food
Industrial Transportation
Securities Brokers
Aerospace
Publishing
Building Materials
Containers & Packaging
Home Construction & Furnishings
Diff Weight (%)
0.02
0.01
0
-0.01
-0.02
-0.03
-0.04
-0.05
-0.06
-0.07
Quantal (Thu Mar 28 18:12:14 PST 2002)

sions. That is, if buyers who are less sensitive to car prices are also those whose have a preference for lower emissions, then Toyota can charge a higher price for those less price-sensitive buyers - if their feeling of environmental friendliness is enhanced by Hollywood celebrities driving a Prius, all the more consumer surplus or price inelasticity. On the other hand, the added production cost of the hybrid drive (which has not been disclosed) may be equal or greater than the incremental price that Toyota can charge this customer group for the Prius. A second interpretation is that the Prius image produces a private gain to Toyota in the form of a more valuable real option to be first-to-market with the same or improved technology in other Toyota vehicles. Given the degree of uncertainty surrounding regulations, alternative-fuel technology, and price trajectories for carbon-based fuels, one could reasonably argue that this is a valuable option.

There are numerous studies attempting to discover to what extent CSR-investments, e.g. environmental "friendliness" beyond that clearly mandated by regulation, can be leveraged into improved corporate performance and firm value. In short, does "voluntary" social value creation also lead to firm value creation? Two extremes often cited in the debate are Porter and van er Linde (1995) and Walley and Whitehead (1994)：the former suggest that a well-designed corporate environmental policy may lead to a first-mover advantage for the corporation, while the latter argue that such instances are rare. Rugman and Verbeke (1998) provide a broad literature review of profit-CSR (environmental) tradeoffs, concluding that "…… at the firm level …… It is often unclear *ex ante* whether industrial and environmental performance is complementary or conflicting"(p. 366). Rugman and Verbeke present a useful second matrix of private cost-social cost tradeoffs that defines a link between corporate profit and environmental performance depending not only on the degree to which environmentally-friendly investments can be leveraged for corporate profit-making ends, but also on the irreversibility of those investments and the uncertainty of the leveraging effects.

A related strand of the literature, that sometimes defines CSR more broadly than the environment, looks at firm level profitability data, and tries to test empirically whether, cross-sectionally, firms that score high on CSR criteria have higher profitability, all else equal. The evidence seems mixed, which is perhaps not surprising given the often-broad criteria for CSR ratings and the well-known problems of using historic cost accounting-based measures of firm profitability from year-to-year[13)] . But, especially since for SRI pur-

poses I want to look at the performance of individual stocks of companies, the focus on company profit and environmental performance goes in the right direction.

If the stock market is efficient, an obvious remedy for the problems in accounting-related performance measures is to relate the risk-adjusted returns on stocks to their CSR ratings, and indeed Derwall, Guenster, Bauer, and Koedijk（2005）have recently done this. They look at the returns on portfolios of stocks formed on the basis of Innovest rankings of "eco-efficiency" which appear to measure the tradeoff between "waste" as a cost and profit/value as a benefit. The Derwall et. al. study is more carefully done than a lot of the earlier studies: it looks at returns on portfolios formed *ex ante* on the basis of the eco-efficiency scores（the portfolios are rebalanced annually）[14], and it tries to control for factor risk and style differences in portfolios of high-ranked and low-ranked stocks. The finding is that the risk-adjusted return on the high score portfolios exceeds that on the low score portfolios by some 2% to 6% annually, the exact magnitude depending on how risk is measured etc.

At the same time, the relatively short time period for the rankings used by Derwall et. al. - May 1997 to May 2003 - and relatively small number of companies - 180 at the beginning, 450 by May 2003 -- are problematic. In particular, it appears（from their Figure 1）that much of the higher return for the higher ranked stocks occurs subsequent to mid-1999, and perhaps 50% of that second-half sample period return occurs in the mid-1999 period to mid-2000 period[15]. One hypothesis is that, over the relatively short sample period they examine, it is the "scientifically and technologically based" firms with adept managers that have *ex post* both done well and likely had higher Innovest rankings, while the older manufacturing companies are more likely to have had lower rankings and relatively poor stock market returns, e.g. the return on Genentech（DNA）from the beginning of January 1997 through November 2005 has been about 30% annualized, compared to say GM with -3.0%. In some of their tests, Derwall et al do attempt to compare "good apples" and "bad apples"（i.e. apples with apples）by comparing best-in-class against worst-in-class portfolios of stocks, controlling for sectors, and the like. The problem is that the stocks within extant sector classifications are quite heterogeneous and thus allow "apples" to be compared with "oranges" within sectors, while style-based classifications are well known to "…… have proven to be both imprecise and inconsistent"(e.g. Held（2005））.

I hypothesize that ranking companies by characteristics that proxy for corporate inno-

vativeness, scientific skill, and management prowess will produce realized returns of the same order of magnitude as those observed by Derwall et. al. There are some existing results that suggest that this hypothesis is at least reasonable. First, Chan, Lakonishok and Sougiannis's (2001) results suggest that stocks with a high ranking of R&D expense as a ratio of equity market value could be associated with higher subsequent return of around 6% annually, roughly comparable with the excess return in Derwall et al. Moreover, Chan, Lakonishok and Sougiannis find that the stocks with a high ratio of R&D/Equity Value have performed poorly over the preceding period (i.e. they have a relatively low Equity Value and thus high ratio of R&D/Equity Value)- this would imply prior negative momentum in these stocks, something that Dewell et al observe in the returns on portfolios ranked by the Innovest eco-efficiency scores. Second, assuming that companies with a "high quality scientific/technology"- what I am proposing as a measure of higher CSR stocks all else equal -- are more likely to be classified as "growth" stocks, it is interesting that growth stocks and value stocks had roughly equivalent return performance from 1997 through early 1999, then growth outperformed value through the end of 2001, just as did the "best-in-class" and "worst-in-class" portfolios in Dewall et al. - admittedly this can only be half the story, since the Dewall difference portfolio looks like it continued to outperform post-2001 whereas value stocks did better than growth stocks in that period[16].

In subsequent work, I plan to look empirically at the connection between CSR defined as above, and equity market performance. If indeed corporate innovativeness is the "mark" of CSR, and if there are measurable characteristics that help us predict such innovativeness ahead of the market, the incentives for SRI investing are enhanced accordingly[17].

To be concrete, I plan to look at corporate characteristics as instruments for "innovativeness" such as the following：(1) R&D/Assets；(2) Advertising/Assets；(3) (Cash Flow net of R&D and Advertising Expense)/Assets；(4) Long-Term Asset Accruals/Assets. For all four characteristics, I also consider using Equity Market Value rather than book Assets as a deflator.

The first three characteristics have been used by Hall (1993) and Chan, Lakonishok and Sougiannis (2001) as measures of corporate intangibles. The fourth is included since it is a measure of capital investment which has been shown to be associated with future negative returns, and also with higher free cash flow and management discretion by Titman,

Wei and Xie (2003) and Li (2004)-it is a potential confounding effect that I want to include in exploratory analysis.

These preceding measures are available in the global S&P Compustat database, but it is obvious that they are extremely crude measures of the desired true characteristics of managerial and technological innovativeness. R&D Expense is well-known to be extremely problematic - it is only a very noisy measure of research outlays, not results. As just one of many examples, the U.S. company 3M has been pushing hard into nanotechnology as part of a revamped R&D program that has resulted in nanotechnology-based products such as energy-saving superconductive power cables. In 3M's R&D program, "product development cycles have shrunk from an average of four years down to two and a half, operating profits are up 23 percent, and R&D spending as a percentage of sales - a key bang-for-your-buck barometer --- last year hit an all-time low of 5.7%" (Business 2.0, November 2005, p. 54, Emphasis added). Hall (1993) also found that the stock market's valuation of R&D has changed considerably over time, compared for example to the valuation of advertising expenditure.

For my future empirical work, I will be adding variables designed to capture the relative effectiveness of R&D - variables such as the size of the company, flux of industry (e.g. impending disruptive changes in technology in auto drive-trains), type of suppliers. It is undoubtedly naïve to think that any one set of generic characteristics will be appropriate across all firms, given the wide variety of ways in which companies sustain their comparative advantage (economic "rents") and in the links between the "private wins" and "public wins."

4. Summary and Discussion

The underlying tenet in this paper is that CSR becomes an issue because something is "broken," viz. markets are incomplete, information is incomplete, and incentive problems arise because management (or employee) contracts are incomplete, while the rules and regulations that might be stopgaps to the incompleteness are themselves often flawed and/or incomplete, especially when they operate in a dynamic real-world context. In such an context, there will be at least short-run opportunities for corporate managers to adopt "win-lose" policies whereby the corporation or the managers themselves "win" and the

environment, employees, etc. “lose.” I believe that it is useful to define CSR as managerial “innovativeness” in transforming such private gain-social cost situations into “win-win” situations. That is, CSR is the process of creating a structure whereby the Coase theorem applies, creating technological solutions where there is no longer an externality; where companies do well by enhancing their reputations in product or employee markets that stems from doing good; or even lobbying for changes in badly designed rules and regulations that led to “win-lose” situations in the first place.

I argue that SRI funds that exclude stocks should be expected to generate returns that are lower than the market if they are successful in driving up the cost of capital of those excluded firms, but that there is very little evidence or grounds for hope that they will in fact be successful. I show in Section 2 that it is possible to use modern portfolio management techniques to minimize underperformance of an SRI fund, but that underperformance cannot be reversed for a fund that simply excludes non-CSR stocks.

If I accept the definition of CSR as technological or managerial innovativeness that progressively eliminates situations in which externalities are not priced, turning them into “win-win” propositions for companies, then an SRI fund that can identify such stocks ahead of the market may in fact be able to outperform. I offer criteria that might be useful in identifying such stocks in future research.

Notes

1）SRI: Socially Responsible Investing

2）CSR: Corporate Social Responsibility

3）I thank Terry Marsh, Indro Fedrigo and Paul Pfleiderer for helpful comments.

4）See also Entine（2003）for a critique of social investing claims

5）As Hawken et al（p. 31）put it：“[T]he industry has hooked people on the idea that SRI funds should do as well as or better than other mutual funds ……”

6）In Myers（1984）pecking order model of financing, secondary equity issues are generally last on the list of sources for financing. Internal funds aside, a company faced with a higher cost of capital due to the actions of a concentrated group of SRI stockholders could substitute debt or other financing.

7）The focus on investment decisions ignores “browbeating” other shareholders, negative press coverage etc. to discourage other investors from buying shares in the target company. However, when Bushee and Miller（2005）study of the converse -- retention of an investment relations firm to “improve” stock price - they find that such actions have little impact on the

prices of NYSE and AMEX firms (the only impact occurs on small and mid-cap firms). This "informational pressure" on the product demand side which is potentially more important and discussed later.

8) Since there is often incomplete information and ambiguity about the current and future regulatory framework, etc., the demarcation is typically less clear in practice than implied by this statement.

9) Of course, aggregate dividends and earnings grow over time due to new investment and reinvestment of higher retained earnings, but these dividends "belong" to the newly invested capital, not the "beginning" investors.

10) Survey evidence supports this assertion ： TechnoMetrica surveyed 1,011 American consumers in September 2005 to find out what they thought of efforts by carmakers to offer hybrids to consumers, and concluded ："…… Toyota - and Honda - are doing well [in] convincing American consumers that they are more committed to building greener cars than their competitors."

11) The Economist (2005) quipped that ："…… press a CEO for details of a company's CSR policies, and …… you find that every firm believes that its CSR actions fall in the win-win box" (p. 8). This may miss the point of CSR, at least insofar as it involves transforming the other boxes to the "win-win" box. If this is happening, then it is at least plausible that those managers with the strongest CSR policies are non-delusional and have better than random grounds for believing that they are in the win-win box.

12) The diagram shown is from the Economist, p. 8.

13) Over multi-year horizons, when accounting rates of return tend to "line up" cross-sectionally with rates of return on companies' listed securities, companies and CSR policies undoubtedly change, so there seems little hope that simple accounting-based studies will give definitive answers.

14) Thus avoiding a potential misinterpretation in cross-sectional studies that find firm performance and CSR are positively related, viz. firms that have done well in the past may be more likely to engage in CSR practices.

15) Note that, in Derwall et. al., the rankings were extended back two years, from May 1997, the beginning of the sample period. If there is a positive association between the firms that were ranked in May 1997 and the performance of those firms in the two years prior to May 1997, there is a potential look-back bias in the differential returns. But the differential returns appear small in that look-back period.

16) Since there was substantial dispersion within value stocks in this period, it is hard to make a more concrete interpretation without knowing more about the identities of the stocks in the portfolios.

17) Albeit this does fall afoul of Hawken's admonition that "[t]he obsessive drive to compare SRI funds with conventional funds should cease" (p. 30).

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＊本稿は，東京経済大学 2003-2005 年度国外研究における成果の一部である。

―― 2005 年 11 月 28 日受領 ――