**An Empirical Analysis of the Strategic Use of Corporate Social Responsibility**

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Abstract

Recent theories of the strategic use of corporate social responsibility (CSR) emphasize the role of information asymmetry and how CSR is likely to be matrixed into a firm's differentiation strategy. A key empirical implication of these theories is that firms selling experience or credence goods are more likely to be socially responsible than firms selling search goods. Using firm-level data, we report evidence that is consistent with this hypothesis.

Keywords: Corporate Social Responsibility (CSR), Search Goods, Experience Goods, Credence Goods
JEL Codes: M14, D21

## I. Introduction

Corporate social responsibility (CSR) occurs when firms engage in activity that appears to advance a social agenda beyond that which is required by law. For instance, an automobile manufacturer could produce "hybrid" vehicles, which significantly exceed government fuel efficiency requirements. Similarly, a savings and loan association is said to be socially responsible when it approves a higher proportion of loans to poor or minority borrowers than required by the Community Reinvestment Act, which governs the lending practices of these institutions.

Recent theories of CSR (Baron (2001), McWilliams and Siegel (2001), Bagnoli and Watts (2003)) assert that firms engage in "profit-maximizing" CSR. That is, companies are assumed to be socially responsible because they anticipate a benefit from these actions. Examples of such benefits might include reputation enhancement, the ability to charge a premium price for its output, or the use of CSR to recruit and retain high quality workers. These benefits are presumed to offset the higher costs associated with CSR, since resources must be allocated to allow the firm to achieve CSR status.

These theoretical studies emphasize how this activity is likely to be matrixed into a firm's differentiation strategies. They also focus on the importance of information asymmetry. The purpose of this paper is to determine whether observed patterns of investment in CSR are consistent with the strategic use of CSR. More specifically, we present a simple empirical test of the hypothesis that firms selling experience and credence goods are more likely to be socially responsible than firms selling search goods.

The remainder of this paper is organized as follows. In the next section, we briefly review some recent theoretical studies relating to the strategic use of CSR. This section also

outlines the simple model we wish to estimate. Section III presents our data and describes the construction of variables used in the empirical analysis. Empirical results are presented in Section IV. The final section consists of caveats and preliminary conclusions.

**II. Literature Review and Theoretical Model**

To the best of our knowledge, Baron (2001) and McWilliams and Siegel (2001) were the first two papers to explicitly model "profit-maximizing" CSR. Baron (2001) coined the phrase "strategic CSR." He defines CSR as the "private provision of a public good." More importantly, Baron (2001) asserts that companies compete for socially responsible customers by explicitly linking their social contribution to product sales. A good example of such strategic CSR was Ben and Jerry's commitment to donate 7.5% of its pre-tax profit to social causes.

In a similar vein, McWilliams and Siegel (2001) outlined a simple theoretical model in which two firms sell identical goods, except that one company decides to add an additional "social" attribute or feature to its product. This social feature is valued by some consumers or, potentially, by other stakeholders. In this theory of the firm-based model, managers conduct a cost/benefit analysis to determine the level of resources to devote to CSR activities/attributes. Simply put, firms simultaneously assess the demand for CSR and the cost of satisfying this demand and then determine the optimal level of CSR to provide.

A key implication of a theory of the firm/strategic perspective on CSR is that this activity is likely to be matrixed into the company's business-level differentiation strategies. For example, a "hybrid" version of a Honda Accord generates less pollution than a standard Honda Accord. Most consumers will consider the hybrid car to be superior to the standard model. Some consumers are also willing to pay a price premium for the hybrid car, given that the social

characteristic of less pollution is "valuable" to them. Other types of CSR investment relate to the adoption of CSR-related production processes, where the focus of concern relates to the extent to which the firms' production methods are socially responsible. Thus, many natural food companies (e.g., Hain Celestial Group, Inc.) place labels on their products signifying the use of organic, pesticide-free ingredients.

Bagnoli and Watts (2003) extend Baron (2001) by analyzing how the structure of competition in the market for the private good affects CSR. They assume that the consumer has perfect information about both the private good and the associated public good. In their model, the consumer has a willingness to pay because the firm produces a product with jointly supplied benefits. The authors consider two oligopoly models: Cournot quality competition and Bertrand price competition. A key finding of their study is that there is an inverse relationship between the provision of CSR and competition in the market for the private good.

Other papers (Baron (2001), Fedderson & Gilligan, (2001)) provide additional insights on the strategic implications of CSR, especially the role of asymmetric information. While some CSR attributes are easily observed, it is sometimes difficult for consumers and other stakeholder to assess a firm's social performance. The level of asymmetric information regarding internal operations can be mediated by the firm itself or by activists.

For instance, companies such as McDonalds, Motorola, and Nike publish annual reports on social responsibility. One can view this activity as a form of advertising, especially for more general types of CSR. While such reports may be useful, some consumers perceive this information as biased, since it is filtered through senior management. Fedderson & Gilligan (2001) assert that activists can play an important role in addressing this concern, by supplying consumers with a public good, i.e., information they can rely on to choose socially responsible

firms.

McWilliams and Siegel (2001) specifically advanced the hypothesis that a firm selling an experience good is more likely to engage in CSR than a firm producing a search good. Experience goods must be used or consumed before their true value to the consumer can be determined. Examples of experience goods and services are automobiles, appliances, weight control programs and mutual funds. Advertising of experience goods will stress the reputation of the firm for high quality. On the other hand, search goods and services are readily evaluated prior to purchase, and most advertising will involve information about product availability and price. Clothing, footwear and furniture are typically cited as examples of search goods.

The concept of experience and search goods is generally attributed to Philip Nelson (1970, 1974), who developed a taxonomy of such goods that was extended by Liebermann and Flint-Goor (1996). Lancaster (1981) noted that consumers of high quality products have the strongest demand for product information because while low price is typically a reliable signal of low quality, a high price may not signify high quality. Given that affluent consumers are most likely to demand high quality goods, CSR as a signal of product quality is likely to be associated with upscale goods and services.

Our interpretation of this phenomenon combines extends insights from the Bagnoli and Watts (2003) and McWilliams and Siegel (2001) models. Specifically, we assert that consumers view CSR activity as a signal about the attributes of the private good sold by the firm. That is the reason why experience goods are more likely to be associated with CSR.

The notion of a consumer demand for CSR is based on the notion that buyers believe that a reliable and honest firm will produce better products. In the minds of some consumers, CSR is viewed as a signal of such honesty and reliability. Thus, CSR is a form of product

differentiation-a form of advertising to establish or sustain brand loyalty. The producer of a search good such as food or furniture might choose CSR, e.g., to use pesticide-free ingredients or pledge not to use old-growth wood. In this case, the consumer might prefer the product simply because of a desire to support the environment or some other cause, rather than using CSR as an information proxy. Thus, the relative importance of experience versus search goods in the CSR choice is an empirical issue, which provides a key motivation for this paper.

**A Model of Corporate Social Responsibility**

A firm is hypothesized to engage in CSR if it anticipates benefits greater than costs. Let $\Pi_{CSR} = \beta N\mathbf{x}_{CSR} + \varepsilon_{CSR}$ be the *expected* profit earned if a firm chooses CSR. The **x** vector would include input and output prices (a profit equation), and background variables such as product type, market structure, and regulatory environment. An error term $\varepsilon_c$ is appended because this is intended as an empirical exercise. A firm that chooses not to be CSR earns $\Pi_{NCSR} = \gamma N\mathbf{x}_{NCSR} + \varepsilon_{NCSR.}$ The expected net profit from choosing CSR is $C^* = \beta N\mathbf{x}_{CSR} - \gamma N\mathbf{x}_{NCSR} + (\varepsilon_{CSR} - \varepsilon_{NCSR}) = \delta N\mathbf{x} + \varepsilon$, but $C^*$ is not observed. However, we do observe that $C^* = 1$ if a firm chooses CSR and $C^* = 0$ if not, and assume that this implies that $\Pi_{CSR} > \Pi_{NCSR}$. This type of regression equation is routinely estimated as either a binomial probit or logit model, depending on the assumed distribution of the residuals. This approach is analogous to the random utility model, in which consumers are observed to choose a good or service, such as a particular mode of transport, assuming the choice selected confers the highest level of utility, which is not observed.

Although the focus of this paper is upon the subset of the **x** coefficient vector relating to the taxonomy of search, experience and credence goods, the literature suggests that there are additional determinants of the propensity of firms to be socially responsible. Following

Waddock and Graves (1997) and McWilliams & Siegel (2000), we include measures of lagged profitability, firm size, and R&D intensity as control variables. The inclusion of lagged profits is based on the notion that better financial performance results in higher CSR. Size is meant to control for the possibility that large firms are more vulnerable to pressure groups or the possibility that there may be economies of scale in CSR. McWilliams and Siegel (2000) assert it may be appropriate to include R&D investment in this equation, since CSR should be related to product innovation and differentiation strategies, in general. Thus, we estimate equations of the following form:

(1) CSR1 or CSR2 = f (GOODTYPE, LPROFIT, SALES, RDINT)

where CSR1 and CSR2 are dummy variables that are equal to 1 if the firm is considered to be socially responsible; 0 otherwise, GOODTYPE refers to a set of dummy variables denoting whether the firm's products or services are search, experience, or credence goods, LPROFIT is lagged profit (return on equity), SALES is annual sales revenue (a proxy for firm size), and RDINT is the ratio of R&D to sales.

## III. Data

### Measures of Corporate Social Responsibility

The first step in our empirical analysis is to identify socially responsible firms. To accomplish this task, we rely on data from Kinder, Lyndenberg, and Domini (KLD), a firm that rates the social performance of corporations. KLD sells this information to portfolio managers and other institutional investors who wish to incorporate social factors into their investment decisions. Such social investors seek to "screen" their portfolios to exclude companies that

violate their social principles.

We use two alternative measures of CSR based on KLD data. The first measure of CSR (CSR1) is a dummy variable, with a value of 1 if a firm is included in the 2002 KLD Large Cap Social Index (LCSI); 0 otherwise. The LCSI is drawn from the Russell 1000 Index, which covers more than 90% of U.S. stock market capitalization. The Russell 1000 Index is much broader than the Dow Jones or Standard and Poor's indices and thus, includes a higher proportion of smaller (publicly-traded) firms.

KLD uses a combination of surveys, financial statements, articles in the popular press and academic journals (especially law journals), and government reports to assess social performance along eleven dimensions: military contracting, nuclear power, gambling, tobacco, alcohol, community relations, diversity, employee relations, environment, and product quality (innovation/R&D), and non-U.S. operations (usually environment and labor relations). They use these data to assess "strengths" and "concerns" regarding these dimensions of social performance, in order to determine if a company is worthy of being judged socially responsible. The KLD LCSI consists of firms in the Russell index that satisfy all of the following criteria: (1) they derive less than 2% of their gross revenue from the production of military weapons, (2) they have no involvement in nuclear power, gambling, tobacco, and alcohol, (3) they have a positive record in each of the remaining social categories.

Our second measure of CSR is constructed directly from the KLD qualitative measures of social performance. Using the KLD data on community relations, diversity, employee relations, environmental performance, product quality, and international social practices, we sum the strengths and concerns along each of these dimensions for each company. We then compute the sum of a firm's strengths minus the sum of its weaknesses (DIFF). If this difference is non-

negative (DIFF>0) then a firm is defined as being socially responsible or CSR2 =1; 0 otherwise. A drawback of this measure is that it equally weights all strengths and concerns, as well as each social dimension.

**Classification of Search and Experience Goods**

Our next task is to identify whether firms sell search, experience, or credence goods. The basic data set consists of 696 publicly-traded corporations, 495 of which appear in the KLD Large Cap Social Index (LCSI) and thus, are considered to be socially responsible (using our first measure of CSR). These 696 firms were selected because they could be identified as producing either search goods or experience Goods, using the North American Industrial Classification System (NAICS) code, as reported in the COMPUSTAT data base. Conglomerate firms or firms producing industrial products not sold to final consumers are therefore omitted. Table 1 shows the detailed categories of four types of experience goods identified, as well as the search goods, following the classification schema of Nelson (1974) and Liebermann and Flint-Goor (1996).

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Insert Table 1 about here
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*Non-durable Experience Goods* involve frequent purchases (such as food and health and beauty products) that the consumer experiences over multiple uses. Markets for both non-durable experience goods and search goods typically exhibit weak brand loyalty and a high degree of market competition. In other words, the opportunity for inexpensive repeat buying to judge product value renders non-durable experience goods similar to search goods.

*Durable Experience Goods*, such as automobiles, permit less learning from repeat buying and also require longer for a product's attributes to be fully known, e.g., reliability.

*Experience Services* and *Credence Services* both involve a high degree of information asymmetry between sellers and buyers. The products tend to be diversified, so information about one brand or type is not very useful in evaluating competing services, and even with the passage of time the consumer may find it difficult to judge its value. Examples of experience services are air travel and nursing homes. Mutual funds, health care and auto repairs are examples of Credence Services.

Consumers are not totally reliant on firms for product information. Government agencies such as the Consumer Products Safety Commission and the Food and Drug Administration are important sources of information. In the private sector, Better Business Bureaus and organizations such as *Consumer Reports* magazine exist to provide information to consumers. Nevertheless, a firm's reputation is probably one of its most valuable assets, and investing in CSR is a way of enhancing that value.

In our sample of 696 firms, the distribution by class of goods is as follows: search goods (21%), non-durable experience goods (11%), durable experience goods (25%), experience services (37%), and credence services (6%).

## IV. Empirical Results

Table 2 presents descriptive statistics and a correlation matrix for the variables used in the regression equations. Unfortunately, we have only a single cross section, with each variable measured in 2001 and lagged profit computed in 2000. The representative firm in our sample generated approximately $6.9 billion in sales, earned a 14.3% return on equity, and allocated

3.5% of sales to R&D. Not surprisingly, the two measures of CSR are strongly positively correlated. Most importantly, a firm's propensity to sell experience or credence goods appears to be positively correlated with the probability that it is considered to be socially responsible.

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Insert Table 2 about here
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Recall that our key hypothesis is that firms producing an experience good or service are more likely to engage in CSR. To test this conjecture, we estimated probit regressions of the determinants of a firm's probability that it is considered to be socially responsible. Table 3 reports the coefficients and standard errors, which are corrected for possible heteroskedasticity.[1]

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Insert Table 3 about here
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Recall also that we have two dependent variables: CSR1, a dummy variable denoting whether the firm is in the KLD Large Cap Social Index and CSR2, a dummy variable denoting whether the firm has more CSR "strengths" than "weaknesses," according to KLD. The independent variables are dummy variables for search, experience, and credence goods, as well as firm size, lagged profit, and R&D intensity. In columns (1) and (4) of Table 3, we include a single dummy for search goods, while in the remaining columns we include separate dummy variables for non-durable experience goods, durable experience goods, experience services, and credence services. R&D intensity is also included as a regressor in columns (3) and (6).

Several potentially interesting stylized facts emerge from the econometric results. Contrary to expectations, we find no evidence that large firms are more likely to be socially responsible. However, for both measures of CSR, the results strongly suggest that firms producing search goods are less likely to engage in CSR. Columns (2), (3), (5), and (6) reveal that companies selling durable experience goods and especially, credence services have the highest probability of investing in CSR. This pattern is consistent with theories of strategic CSR, which predict that the level of asymmetric information and the importance of firm reputation are highest for credence goods or services.

Although the regression estimates are important, it also useful to compute to increase or decrease in probability of CSR associated with a variable whose coefficient is statistically significant. In this regard, we computed slope parameters, or the marginal effects evaluated at the means of the other explanatory variables. For the dummy variables that measure search, experience, or goods, the marginal effect is $\Delta Prob_C = Prob[C^*=1| z =1] - Prob[C^*=1| z = 0]$, where z is the dummy variable of interest. These findings indicate that selling a search good reduces the probability that a firm is considered to be socially responsible by about 18% (averaged across all the models we estimate), at the margin. Firms whose products are durable experience goods or credence services are significantly more likely to engage in CSR, with an increased probability of about 15% and 23% (averaged across all the models we estimate), respectively.

Various measures of goodness of fit for limited dependent variable models have been proposed in the literature. The average (across all models) pseudo R-squared value proposed for the probit by Zavoina and McKelvey (1975) is .41. Another frequently reported statistic in

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1 We also estimated logit regressions, which yielded similar results.

models of binary choice is the proportion of outcomes correctly predicted by the fitted equation. However, this is sensitive to the chosen probability level, i.e., what P value equates to C* = 1, with .50 as the typical default. That is not satisfactory in the present case because the sample is unbalanced, with .71 of the observations being C* =1 (for CSR1). For example, if a threshold probability of .68 is chosen, then 85% of actual 1s are correctly predicted, and 67% of 0s and 1s correctly predicted.[2] Hosmer and Lemeshow (1989) proposed a diagnostic statistic to assess the match between actual and predicted values (see Limdep 8, p. E15-28 for details). The test statistic follows a chi-squared distribution, and values less than the critical value is evidence in favor of the model. For the probit model of Table 3, the Hosmer-Lemeshow test statistic for variant is always lower than the 95% critical value of 15.51 (prob = .08). Thus, the probit model specification cannot be rejected for each variant of the model.

**V. Conclusions and Caveats**

In a recent insightful survey of CSR, *The Economist* (2005, 8) identified four varieties of CSR, based on whether this activity raised or lowered profits and raised or lowered social welfare. This paper constitutes the first empirical test of recent theories of strategic CSR. Specifically, we focus on the importance of the type of product or service sold by a firm as a

[2] The table of actual and predicted 0s and 1s is shown below.

| | Predicted | | |
|---|---|---|---|
| Actual | 0 | 1 | Total |
| 0 | 47 | 154 | 201 |
| 1 | 72 | 423 | 495 |
| Total | 119 | 577 | 696 |

determinant of management's decision to invest in CSR. This decision could represent a signaling device regarding the quality of the firm's output.

Consistent with these theories of strategic CSR, we find that firms selling durable experience goods or credence services are much more likely than comparable firms to be socially responsible. At the margin, our results imply that a firm selling financial services (a credence service) is about 23% more likely to opt for CSR. Similarly, a firm producing durable experience goods, such as automobiles or software, is about 15% more likely to be socially responsible. Firms selling experience services or non-durable experience goods are no more likely to adopt CSR than a firm whose product is a search good.

While additional research is needed to pin down the diverse reasons why firms adopt a CSR stance, the evidence presented here supports a view that it is consistent with theories of strategic CSR and rational, profit-seeking management decision-making. Others may view the same evidence as proof that CSR is a 'fraud' or 'smokescreen' to disguise the same behavior, which they abhor.

Several caveats should be mentioned. The first is that our empirical analysis is based on a single cross section of data. It would be useful to test theories of strategic CSR using panel data, which would enable us to better control for unobserved firm heterogeneity and changes in CSR behavior and its determinants over time. A second concern is the possibility that our econometric analysis is subject to omitted variables bias. In contrast to ordinary least squares estimation, the estimated coefficients in a probit model are inconsistent, even if the omitted variables are uncorrelated with the included regressors (see Greene (2000) (p. 828). It is impossible to assess the importance of this effect on our estimates of the impact of good type on the propensity of firms to engage in CSR.

**Table 1**

**Classification of Search, Experience, and Credence Goods**

| ***Search Goods*** | ***Non-Durable Experience Goods*** | ***Durable Experience Goods*** | ***Experience Services*** | ***Credence Services*** |
|---|---|---|---|---|
| Clothing | Health/Beauty | Housing | Advertising | Investments |
| Furniture | Cigarettes | Automobiles | Transportation | Trusts |
| Footwear | Food | Appliances | Vacations | Portfolio Management |
| Carpets | Cleaners | Hardware | Education | Mutual Funds |
| Mattresses | Newspapers | Drugs | Training | Insurance |
| | Office Supplies | Glasses | Tours | Health Care |
| | | Software | Transportation | Weight Control |
| | | Signs | Banking | Car Repairs |
| | | Books | Car Rentals | |
| | | Sporting Goods | Entertainment | |
| | | Hobbies | Direct Mail | |
| | | Utilities | Real Estate | |
| | | | Cargo | |
| | | | Job Placement | |
| | | | Information | |
| | | | Nursing Homes | |
| | | | Sports Clubs | |
| | | | Hotels | |
| | | | Waste Collection | |
| | | | Landscaping | |

## Table 2

**Descriptive Statistics and Correlations (N=696 firms)**

| | Mean | Std. Dev. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. CSR1 | ..71 | .45 | ---- | | | | | | | | | |
| 2. CSR2 | .38 | .49 | .24** | ----- | | | | | | | | |
| 3. Search | .06 | .24 | -.08 | .11 | ----- | | | | | | | |
| 4. Non-Durable Experience Good | .11 | .31 | -.06 | .05 | -.09 | ----- | | | | | | |
| 5. Durable Experience Good | .26 | .44 | .13 | .12 | -.15 | -21* | ----- | | | | | |
| 6 Experience Service | .36 | .48 | .14 | .11 | -19 | -.27** | -.45** | ----- | | | | |
| 7. Credence Service | .21 | .40 | .21* | .28** | -.13 | -.18* | -.30** | -.39** | ----- | | | |
| 8. Sales ($mil) | 6914.77 | 0.59 | -.06 | .05 | .06 | -04 | .06 | -.01 | -.05 | ---- | | |
| 9. Lagged Profit | 14.28 | 20.48 | .02 | .01 | .07 | .05 | -.02 | .00 | -.06 | .07 | ---- | |
| 10. R&D Intensity | 3.54 | 26.42 | .05 | .04 | -.01 | -.04 | .15* | -.06 | .08 | -.03 | -.01 | ---- |

Notes: $^{+}p < .10$; *p < .05; **p < .01

**Table 3**

**Probit Estimates of the Determinants of the Propensity of Firms to Engage in CSR**

| **Independent Variables** | **Dependent Variable: CSR1** | **CSR1** | **CSR1** | **CSR2** | **CSR2** | **CSR2** |
|---|---|---|---|---|---|---|
| Constant | .576*** (.063) | .457*** (.075) | .387*** (.091) | .360*** (.112) | .381** (.123) | .299** (.145) |
| Search | -405** (.199) | | | -.366** (.181) | | |
| Non-Durable Experience Good | | -.094 (.152) | .043 (.088) | | .054 (.139) | .062 (.092) |
| Durable Experience Good | | .232** (.112) | .254** (.125) | | .232** (.112) | .244** (.121) |
| Experience Service | | .133 (.120) | .142 (.101) | | .153 (.116) | .158 (.105) |
| Credence Service | | .387*** (.143) | .412*** (.156) | | .452*** (.164) | .403** (.193) |
| Sales | -.052*** (.019) | -.050*** (.018) | -.041* (.026) | .012 (.016) | .131 (.132) | .115 (.093) |
| Lagged Profit | .001 .001 | .001 (.001) | .005** (.002) | .004* (.002) | .002 (.002) | .004** (.002) |
| R&D Intensity | | | .082 (.060) | | | .073 (.051) |
| Log Likelihood | - 411.66 | - 394.18 | - 392.82 | - 397.29 | -381.25 | -380.89 |

N = 696 firms, Standard Errors in parentheses. Significance: * p<.1; ** p<.05; *** p<.01

CSR1 is a dummy variable, with a value of 1 if a firm is included in the 2002 KLD Large Cap Social Index (LCSI); 0 otherwise.

CSR2 is a dummy variable, with a value of 1 if a firm has more CSR strengths than weaknesses; 0 otherwise.

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