Negative economic consequences of ethical campaigns?: Market data evidence

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Negative economic consequences of ethical campaigns?: Market data evidence *

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Abstract

This study demonstrates how ethical attributes of goods affect market outcomes on the basis of market data and actual ethical campaigns. Among the various types of such attributes, such as eco-label and fair trade label, I focus on cause-related marketing (CRM), which economists study less frequently than other ethical attributes. Researchers who analyzed this topic focused largely on experimental data, which has less noise and enables researchers to obtain the pure effect of ethical attributes on market outcomes. However, ethical attributes in practice sometimes encounter ignorance and even criticism by consumers who deem it as a mere marketing strategy, rather than a truly ethical campaign. These issues play weak role in experimental data estimates because brands and campaigns are typically artificial, but the important question is how ethical attributes work in the real marketplace. Therefore, I analyze this issue by estimating the demand for CRM on the basis of scanner data of the US bottled water market and actual campaigns. Surprisingly, the results indicate that CRM decrease sales and suggest that negative consequences of ethical campaigns may occur in the real marketplace.

1 Introduction

In economics, the government is known to provide inadequate functions through market mechanism. For example, income redistribution, one of the primary functions of the government, is justified as a government activity because the private sector may not sufficiently redistribute incomes. Another example is public goods production. It is well known that if the onus of producing public goods is left to the private sector, their attainable level will fall short of the

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socially optimal level. However, many theoretical and empirical studies have verified that non-governmental players also influence the production of these public functions [1]. In brief, although governments are primarily responsible for producing those functions, altruistic behavior by non-governmental players also complement or substitute government activities[2]. But why is this so important? I think the advantage of altruistic behaviors is their self-motivated attribute. Governments often face an efficiencyequity tradeoff with peremptory intervention. For example, the non-availability of a lump-sum tax policy makes governments use a distortional tax to implement a redistribution policy; however, this causes a distortion in the labor supplyan unwanted side effect of the policy. In contrast, donations to the poor, for example, are actions taken by one's own preference, and therefore create less distortion in the economy than government policy. However, not all altruistic behaviors are self-motivated. One such example is corporate philanthropy, which may not result from self-motivation, but de facto compulsion. Currently, there have been increasing claims that a company's social contributions are an obligation to society, and it is generally considered that, in fact, standard practices and regulations exert a de facto compulsion on corporate behavior. However, because companies are organizations whose inherent purpose is profit generation, they have the economic incentive to subtly avoid social contributions. One example is forcing a company to pay higher rates in a developing country than the standard rates determined by the market. In these circumstances, the company can mitigate the effects of such obligations by building fewer plants, or raising the capital/labor ratio without any legal violations. In either case, the outcome is a reduction in the demand for labor in that country, and unwanted distortions arise as a result of such regulations. Certainly, many necessary regulations exist for ethical reasons and I believe that not all companies necessarily circumvent those regulations; however, it should be noted that policy effects are not straightforward in terms of corporate responses. This problem results from the inconsistency between economic and social objectives. In this example, the two objectives can be compatible if goods produced under fair working conditions are more effectively evaluated in the market. Ethical goods are one such tool. Consumers' positive reaction to goods produced in an ethical manner mitigates part of the additional costs required for responsible production, and the gains may even exceed the costs.

[1] For example, there is extensive research on crowding out hypothesis, which states that the effect of income redistribution policy may be weakened or even invalidated by the reduction of private income transfer (e.g. Barro (1974); Becker (1974); Bernheim et al. (1985); Cox (1987, 1990); Cox and Rank (1992); Altonji et al. (1997); McGarry (1999)). There is also the extensive literature on charity, donation, and private public goods production. (e.g. Abrams and Schmitz (1978); Warr (1982); Roberts (1984); Bergstrom et al. (1986); Bernheim (1986); Andreoni (1988, 1989, 1990); Ihori (1992); Andreoni (1993, 1995); Glazer and Konrad (1996); Ihori (1996); Houser and Kurzban (2002); Ribar and Wilhelm (2002); Auten et al. (2002); Andreoni and Payne (2003); Andreoni and Petrie (2004); Hungerman (2005); Potters et al. (2005); Andreoni (2006); Karlan and List (2007); Ihori and McGuire (2007); Shang and Croson (2009)).

[2] For instance, income transfer in a community (e.g., household, village), volunteering, donation, and philanthropy.

This study examines how ethical characteristics of goods affect market outcomes, using market data and actual campaigns. Among the many types of ethical goods, this study focuses on cause-related marketing (CRM). In short, CRM can be described as campaigns by companies that pledge to donate a certain portion of sales to good causes. In general, CRM can be defined as campaigns that connect the company's economic outcomes and social contributions and highlight this fact to society. For example, through the Statute of Liberty Restoration Project undertaken by American Express in 1983, the company donated $1 to the project for every new credit card registered and 1 cent every time one of their cards was used. They finally donated $1.7 million to the project. In addition, this campaign also significantly impacted economic outcomes, with the issue of new cards up by 45 % on a year-on-year basis and usage by 28 % year-on-year growth. From this example, we confirm that CRM directly links the donation conditions to the company's economic performance, and the fact that this is made evident to consumers is a significant departure from traditional social contributions. This CRM characteristic implies that consumers can motivate companies to make donations and provide positive feedback to such companies via their actions in the market. Simultaneously, as the example demonstrates, the campaign also has considerable economic success. Another way in which CRM differs from traditional social contributions, which it often receives criticism, is that such campaigns risk being seen merely as social marketing activities (as the name indicates). That is, CRM activities, when viewed positively by consumers, can influence company sales and profits in the same manner as other characteristics of goods. This fact draws the criticism that companies act in anticipation of these benefits, and use such campaigns only in the pursuit of profits. From the outset, this study does not aim at revealing true corporate motives as such a task would be impossible. Instead, this study focuses on the possibility that the effects of CRM may be changed by consumer's perception toward the campaigns[3], and estimates the effect by combining market data and actual campaigns .

The ethical aspect of goods has traditionally been the topic of research in management studies, (e.g. Varadarajan and Menon (1988); Strahilevitz and Myers (1998); Webb and Mohr (1998); Barone et al. (2000); Polonsky and Speed (2001); Basil and Herr (2003); Olsen et al. (2003); Pracejus and Olsen (2004); Lafferty and Goldsmith (2005); Luo and Bhattacharya (2006); Barone et al. (2007); Lafferty (2007); Hoek and Gendall (2008); Lee Thomas et al. (2011)) however, they have also been widely researched by economists over the past few years. Although various types of ethical goods exist, they share the fundamental concept of using labels as an indicator of a company's commitment to society. I briefly introduce them, referring to previous studies. As shown in Teisl et al. (2002), with the regulatory changes made in 1990, the dolphin-safe label resulted in the acceleration of tuna sales. This study pertains to eco-labels, and investigates how demand is influenced by the assurance that goods have been produced using eco-friendly methods. Fair trade label research, in

[3]whether that perception accurately reflects the company's true motives

contrast, deals with labels that guarantee that such products are made after the consideration for producers in developing countries, and analyzes the impact that such labels have on demand and the willingness to pay (E.g.Loureiro and Lotade (2005); Arnot et al. (2006); Basu and Hicks (2008); Hainmueller et al. (2011); Hiscox and Litwin (2011)). Arnot et al. (2006) was a field experiment conducted with the cooperation of a coffee vendor on a university campus, which revealed that a fair trade product had less price-sensitivity, implying that its demand did not decrease as much as that of non-fair trade products when its price increased. Prasad et al. (2004) is another fair trade example for a product other than coffee. The researchers stocked adjoining shelves selling identical pairs of socks in an American department store. On one shelf, and on the pairs of socks themselves, they pasted labels stating Good Working Condition (GWC), while they placed no such labeling on the other shelf and pairs of socks. Results demonstrated that the ratio of sales was equal when both sets were identically priced, but the fair trade socks retained a 25% share when their price increased. Prasad et al. (2004) asserts that this result signified conscientious consumption. Hiscox and Litwin (2011) represents e-commerce research, in which researchers, with the aid of a coffee importing and roasting company, studied the impact of labels on the winning bid price on eBay, by selling one lot of coffee beans with a fair trade label, and another without such labeling. They found that the winning bid price of the fair trade product was 20% higher. Hainmueller et al. (2011) is probably the closest to my research in terms of its awareness of the issues, in which it conducted a field experiment with the help of 26 stores of a major US grocery store chain and performed a logit demand analysis on the data obtained. They found that fair trade goods had less price elasticity than those bearing generic coffee labels.

Thus, although many studies have examined fair trade and eco-labels, few have explored CRM. However, fair trade and eco-labels are different in nature compared with CRM in terms of the following three factors. First, fair trade and eco-labels are certified by external authorities, which is rare in CRM. Therefore, compared with other labels, CRM outcomes are more readily influenced by the trust placed in the specific company or industry. Of course, external approval influences certain cases, as CRM implementation involves the considerable cooperation with external nonprofit organizations (NPOs). However, CRM is often limited to a specific time period, and thus the company in the long term can cut ties with one NPO and build a cooperative relationship with another for a different cause. For consumers who are only interested in a specific cause or NPO, this change can be a disadvantage in terms of commitment. Second, fair trade and eco-labels are on the basis of the premise of close production relationships, which does not necessarily apply to CRM. Therefore, CRM has a broad scope of application. Moreover, the fact that CRM need not necessarily be related to production implies that it has a range of options among beneficiaries, which may include citizens of developed countries. The aforementioned American Express project is a good example of this factor. However, as the environment and problems in developing countries are long-term issues closely associated with production, the fair trade label or the eco label, with their inherent links to production, may present a better impression on consumers. Finally, the most important difference is that consumers can directly influence donations by purchasing goods with CRM. Of course, other labels are also related to supporting a cause by making a purchase, but the marginal effect of the purchase cannot be easily determined compared with CRM. The transparency of such effects in CRM might work to its advantage when compared with other labels. Ultimately, although CRM and other labels seem similar, they actually differ in various aspects and, as one naturally anticipates differences in their impact on market outcomes, I believe it is worthwhile to empirically demonstrate the economic consequences of CRM.

McManus and Bennet (2011) describes research on such a CRM-like campaign. Via NPO aid, they randomly offered various conditions to the people who visited the NPO's on-line shop and analyzed the impact of the difference in these conditions on their purchasing behavior. In principle, this experiment promised a separate donation being made from an outside fund if the purchaser fulfilled specific conditions. The conditions were broadly categorized as follows: (1) the purchaser needed only to purchase a product worth \$10 or more; (2) In addition to the purchase, the purchasers themselves also needed to make a donation of \$10 or more. These two categories were further subdivided according to the amount of donation funded by the outside source, and whether discounts applied to the purchased product. The results revealed that on average 20% more revenue was generated from those consumers who were offered the donation pledge than from those who were not. However, what is surprising is that this increase in revenue was primarily derived from excessively large increases in purchase amounts, not required to trigger outside donations. Moreover, when consumers did not make a donation themselves, despite it being required to trigger the outside donation, they still increased their order amounts. However, consumers paid attention to the level of purchase amounts that would trigger donations when the outside donation was comparatively high. They also found that these responses were not the substitution from future. Their results indicate that consumer response to socially linked products is complex.

To the best of my knowledge, previous studies usually use either a stated preference measure or experimental data. Both have their advantages; the stated preference measure is convenient and flexible, while experiments reduce noise in the estimation and allow the use of data pertinent to one's research question. However, in my opinion, in the following three respects, the results calculated by such methods may overestimate the real-world effect.

First, merely asking people for an assessment of CRM goods, or presenting CRM goods and non-CRM goods to determine which one they would buy, may not sufficiently motivate the respondent to express their true preferences. For example, if the respondent wishes to be seen favorably, this method may motivate them to over-emphasize the positive impact of CRM. If the experiment is well planned, this factor may not be very problematic, but it is also possible to address the issue using market data.

Second, studies that use the stated preference measure clearly state whether a product implements CRM; this is often the case for studies that use the experimental method. However, these circumstances do not necessarily apply when consumers purchase goods in the actual market. That is, the problem is whether consumers are actually aware of such information when they make their decisions. Although one can obtain CRM-related information in shops through packaging and other labeling, if customers do not consider such information as important, they would not pay much attention to it and may choose products without being aware of all the facts. In fact Langen et al. (2010) uses an information display matrix (IDM) to study the type of information considered as important in decision making. They found that consumers do not consider ethical attributes as important compared to price, taste, and brand. This issue also exerts an overestimation on results, as it is reasonable to assume that if consumers are unaware of a fact, they cannot affect demand. However, certain studies have conducted experiments in simulated market situations, and so this issue is not necessarily impossible to resolve in an experiment.

Finally, the most important difference is that ethical attributes are not necessarily perceived in a positive light. In fact, companies in the American bottled water market that this study analyses have come under increasing criticism from the perspective of environmental protection; even their environmental initiatives have often been criticized as greenwashing. CRM activities are also currently facing criticism[4]; typical rumors include that most of the revenue does not go toward donations, and therefore it is better to make donations personally and drink tap water, which is more eco friendly. If consumers perceive a certain industry as systematically placing a burden on society, they will tend to perceive donations as a ruse, and this opinion may cause a drop in sales. By experimental methods, the person conducting the experiment usually creates hypothetical goods and campaigns, and performs analyses on the basis of short-term results. This approach serves well to identify net influences in a virtually neutral state; however, were such activities to take place over a long term in the real marketplace, such criticisms (whether justified or not) would be unavoidable. To understand whether it is possible to use CRM activities to pursue the joint goals of company profits and social contributions, we must conduct empirical research that includes these negative influences, rather than merely including the net effects, and I believe that this can currently be achieved only by using market data.

To the best of my knowledge, no studies have combined actual purchase data with real-world CRM campaigns. Accordingly, this study evaluates how CRM affects the market share using only real-world market data. Because most previous research has found a positive impact of ethical attributes, I think measuring the effect in the real marketplace is important as a test of the results, given the aforementioned possibility that the results may not hold in the real marketplace. To test that, I use data on the bottled water market throughout the United States from 2006 to 2010, obtained from IRI. I use the nested logit model to infer demand and measure the impact of CRM. Surprisingly, the results reveal that CRM exerts a negative impact on demand. Although I think that

[4]This trend is not specific to the industry.

the result needs further verification by other researchers, it suggests that CRM's actual impact in the real marketplace is more limited than previously believed.

The paper proceeds as follows. Section 2 describes the estimation method to measure the effect of CRM base on market data. Section 3 describes the data and includes details of actual CRM campaigns. Section 4 reports the results and Section 5 concludes.

2 Estimation method

There are certain products which implement CRM while others do not. In addition, even products that have implemented CRM for a time have periods without CRM. My analysis attempts to estimate the impact of CRM on demand by using this data structure. A major advantage of experiments is that researchers can eliminate differences in product quality and price by simply changing labels while keeping other attributes unchanged. In contrast, a common problem in studies that use observational data is that researchers actually compare samples that are essentially different in nature. In general, one can address this issue by setting primary explanatory factors as independent variables. However, such literature states that it may have the problem of unobservable factors. Therefore, I choose the bottled water market as the subject of my research. Because the quality of water can be chemically examined, it is valid to assume few unobservable factors. Nonetheless, certain factors remain difficult to quantify as variables. I assumed these factors to be constant during the period, and eliminated the risk by taking the difference to avoid generating bias on other estimated values. Furthermore, by inserting time and seasonal dummies, I eliminated other time-related effects. However, despite these processes, the data quality remained relatively poor compared with experimental data. This limitation is applicable generally when using observational data and is the reason that the results must be interpreted with some reservations.

I adopted the structural estimation approach developed in industrial organization literature (Berry (1994); Berry et al. (1995); Nevo (2000, 2001)). By this method, even with aggregated data at only the market level, we analyze product choices by considering demand and price endogeneity. Moreover, by specifying the indirect utility function, we directly obtain the estimation formula, therefore facilitating the examination of deep parameters. In addition, researchers can select model specification from the simplest logit model to the most generalized full random coefficient model. However, it is widely acknowledged that when using the logit model, market share and price elasticity of demand are not directly dependent on product properties but are determined by mean utility level calculated from the product characteristics (Berry (1994); Berry et al. (1995)). Therefore, I adopted the nested logit model to obtain reasonable results without computational problems that might arise when using the full random coefficient model. Regarding nest selection which is required to use the nested logit model, this study divides data into one group that has undergone carbonation and another that has not . This division follows Friberg and Ganslandt

(2003), which analyzes the impact on welfare of a two-way trade using similar data from Sweden. Following Berry(1994) and Town and Liu (2003), I specified the indirect utility function as follows.

$$U_{ijmt} = \alpha p_{jmt} + \beta x_{jmt} + \gamma D_{jmt} + \xi_{jm} + \varepsilon_{jmt} + \zeta_{ig} + (1-\sigma)\upsilon_{ijmt} \quad (1)$$

$$(2)$$

$$for \qquad i = 1, ..., N; j = 0, ..., J; g = 1, ..., G; m = 1, ...M; t = 1, ..., T \quad (3)$$

Here, the indicators are as follows: i = individual; j = brand; g = nest that includes brand j; m = market; and t = time. The notation is a standard one: p_{jmt} = price of brand j; x_{jmt} = product properties of brand j; and D_{jmt} = variable related to CRM. I divide unobserved heterogeneity in brand j into ξ_{jm}, the portion that does not change over time, and ε_{jmt}, the portion that does change over time. To simplify the notation, I define $\omega_{jmt} \equiv [x_{jmt}, D_{jmt}]$. Moreover, I define $\mu_{jmt} \equiv \xi_{jm} + \varepsilon_{jmt}$. ζ_{ig} represents common preferences for goods belonging to nest g; υ_{ijmt} is the deviation from the mean.

D_{jmt} indicates whether CRM is implemented, and the coefficient represents CRM evaluation by consumers. If consumers perceive CRM favorably, they can indirectly increase donations by purchasing CRM goods because doing so can increase their utility. However, if consumers dislike CRM activities, this negative reaction might instead cause a disincentive to purchase because they can express their opinion by boycotting the products. Alternatively, if consumers are indifferent to CRM, or when they understand it but do not translate it into actions, then CRM is considered unlikely to affect their choices. In reality, consumers vary greatly, and it is likely that a market outcome is decided by the prevalent type of persons, which reflects the perception of CRM in society. Assuming that υ_{ijmt} follows the type-one extreme distribution, I obtain the following estimation formula (Berry (1994)).

$$ln(s_{jmt}) - ln(s_{0mt}) = \alpha p_{jmt} + \beta x_{jmt} + \gamma D_{jmt} + \sigma ln(s_{j/gmt}) + \xi_{jm} + \varepsilon_{jmt} \quad (4)$$

Note that s_{jmt} is the market share of brand j in market m at time t, and s_{0mt} is that of external goods. This equation can be estimated using ordinary least squares(OLS) if μ_{jmt} can be treated as an error term. However, the term includes ξ_{jm}, which represents the unobservable quality of brand j in market m. Since $s_{j/gmt}$ is the share of j in nest g, it probably correlates with the unobservable quality of the product. Moreover, higher quality implies higher prices; therefore, the correlation among p_{jmt}, $ln(s_{j/gmt})$ and ξ_{jm} is the most debatable issue. Conversely, eliminating this term greatly reduces the probability of endogeneity problems because ε_{jmt} is merely a demand shock. By solving the problem by taking delta in relation to t, I arrive at the following formula.

$$\Delta ln(s_{jmt}) - \Delta ln(s_{0mt}) = \alpha \Delta p_{jmt} + \beta \Delta x_{jmt} + \gamma \Delta D_{jmt} + \sigma \Delta ln(s_{j/gmt}) + \Delta \varepsilon_{jmt} \quad (5)$$

If I were to disregard the endogeneity among Δp_{jmt}, $\Delta ln(s_{j/gmt})$ and $\Delta\varepsilon_{jmt}$, I could simply estimate this formula using OLS. In reality, endogeneity may remain; therefore, it is necessary to use IV that correlates with Δp_{jmt} and $\Delta ln(s_{j/gmt})$, but not with $\Delta\varepsilon_{jmt}$. Unfortunately, IV that fulfills all these criteria cannot always be found, and in this case, the IV for $\Delta ln(s_{j/gmt})$ is particularly difficult to obtain. This variable is probably endogenous, and it is extremely difficult to separately obtain a relevant IV.

Therefore, I adopted system generalized method of moments (GMM) estimation and attempted to utilize the historical values of the endogenous variables as IVs (Arellano and Bond (1991); Ahn and Schmidt (1995); Arellano and Bover (1995); Blundell and Bond (1998)). By this estimation method, both the level and difference equations are used as GMM moment conditions. Giacomo (2008) represents the earlier research that applied this method in the context of structural estimation of demand. The difference equation yields the following moment conditions.

$$E(\Delta\omega_{jmt}\Delta\varepsilon_{jm,t}) = 0 \tag{6}$$
$$E(p_{jm,t-s}\Delta\varepsilon_{jm,t}) = 0 \tag{7}$$
$$E(ln(s_{j/gm,t-s})\Delta\varepsilon_{jm,t}) = 0 \quad for \quad m = 1, ..., M; t = 3, ..., T \quad s \geq 2 \tag{8}$$

This formula is based on the idea that Δp_{jmt} *and* $\Delta ln(s_{j/gmt})$ are treated as endogenous variables and can be instrumented at their lags in levels, with the most important assumption for identification being that there is no serial correlation in $\varepsilon_{jm,t}$. To explain the necessity of this assumption, let AR(2) be detected by the Arellano-Bond test. Then, the possible correlation between $p_{jm,t-2}$ *and* $\varepsilon_{jm,t-2}$ will propagate into $E(p_{jm,t-2}\Delta\varepsilon_{jm,t}) = 0$ through the construction of $\Delta\varepsilon_{jm,t}$ because $\varepsilon_{jm,t-1}$ *in* $\Delta\varepsilon_{jm,t}$ clearly correlates with $\varepsilon_{jm,t-2}$ by autocorrelation[5].

In addition, moment conditions can be obtained from the level equation.

$$E(\Delta\omega_{jm,t-1}\mu_{jmt}) = 0 \tag{9}$$
$$E(\Delta p_{jm,t-1}\mu_{jmt}) = 0 \tag{10}$$
$$E(\Delta ln(s_{j/gm,t-1})\mu_{jmt}) = 0 \quad for \quad m = 1, ..., M; t = 3, ..., T \tag{11}$$

Combining these moment conditions to estimate parameters is the concept of system GMM. In practice, too many moment conditions present a problem, so usually estimations use only one lag at a time. I used the program provided by Roodman (2006) in my actual estimations.

3 Data

Since I want to evaluate CRM 's effect on sales in the real marketplace, I purchased scanner data from IRI. I analyzed the bottled water market in the US

[5]Note that AR(2) detected by the Arellano-Bond test implies AR(1) in levels.

because of their relative homogeneity and the fact that many products implement CRM. The dataset includes prices and sales volumes for each product for eight regions in the US and for each quarter between 2006 and 2010. I recalculated and aggregated volumes of each brand into one standardized amount500 ml (16.9 oz)the most common size in the market. For data tractability, I restricted my sample to balanced panel data. This restriction narrowed the data to 40 products. I also eliminated products that held a negligible market share and vitamin-added products, which are substantially differentiated by types of vitamin and quantity added. This further narrowed the number of products to 16. For each product in the dataset, I calculated market shares, taking into account the existence of outside goods. The natural candidate for outside goods is tap water, following Friberg and Ganslandt (2003). Further, I divided the sales volume of each product by potential demand in each market, following Nevo (2001). Potential demand is defined as the product of population in each market and the number of days by 1/2, where 1/2 represents the assumption that the volume consumed per person per day is 250 ml, which corresponds to the actual value of 220 ml/day. I also gathered various product characteristics, such as carbonated or non-carbonated water, minerals, pH, sodium, hardness, and total dissolved solids (TDS) of each product because these natural attributes determine product taste, and omitting them may cause an estimation bias. I also defined three artificial variablesForeign, Flavor, and Publicto obtain reliable estimation results. Foreign is a dummy variable that takes one if the product is produced in a foreign country, and zero otherwise. Flavor is a dummy variable that takes one if the product is artificially flavored, and zero otherwise. Public is also a dummy variable that takes one if the product source is a tap, and zero otherwise. I included the Public variable because bottled water from a public source was especially criticized in this period from the perspective of environmental protection. I also collected information on carbonation, which is controlled through the construction of nests. Finally, I investigated whether each product in the data set implemented CRM. In this study, I regarded products as performing CRM if they satisfy the following two conditions: (1) economic outcomes are directly related to the amount of donation, and (2) products are sold in retailer outlets where the data is collected. For example, Ethos water, which is probably one of most famous products with CRM in this market, was excluded from the sample as it did not meet the second condition, because it sold primarily at Starbucks coffee shops. Finally, three brands were selected on the basis of the criteria as performing CRM during this period. First, Fiji water announced in December 2009 that it was joining the 1% for the Planet alliance and promised to donate 1% of their sales, considered to be a substantial amount, to environmental projects. Accordingly, the CRM dummy for the brand takes one after the first quarter of 2010. Second, Nestle PureLife partnered with the Breast Cancer Research Foundation (BCRF) at the start of 2009, promising to donate \$0.10 to support the fight against breast cancer for each sale of 0.5l multi-pack of Nestle Pure Life Purified Water marked with a pink ribbon. Because the campaigns were done in October, its CRM dummy takes one in the fourth quarters of 2009 and 2010. It has raised over \$1.6 million toward BCRF and has supported breast cancer research significantly since it began. Third, Volvic implemented two campaigns during this period. For each liter of the product purchased between April 1 and August 31 in 2008 and 2009, Volvic promised to donate $0.05 to the US fund for UNICEF to provide clean drinking water to people in Benishangul Gumuz-one of Ethiopia's water-scarce regions. According to their statement, this project supplied clean drinking water to 25,000 people in Ethiopia. In the campaign between August 1 and October 31, 2010, they announced a new partnership with the Rainforest Foundation US and promised to donate $0.05 to the foundation for the sale of every liter of the product. In 2010, the campaign raised $53,000 for the Rainforest Foundation's rainforest protection project. I defined the CRM dummy as taking one during (a) the second and third quarters of 2008 and 2009 and (b) the third and fourth quarters of 2010. Ideally, I should have defined these dummies on monthly basis, but unfortunately, monthly data was unavailable because of limited budget constraints. Therefore, my best alternative was to define the CRM on a quarterly basis. I review this point when I check robustness of the results. Again, note that I DO NOT suggest that these campaigns are spurious. In fact, I personally view them very favorably because they have contributed substantially to society, as described above. In addition, I like the idea of ethical labels because it is a possible solution for the incentive incompatibility problem. Please understand that all I want to do is to measure how people react to them in acutual market.

These data come primarily from bottled water quality reports on official websites. However, for some products, the brand characteristics are not publicly available. Fortunately, sufficient information was obtained from Saleh et al. (2008), which examined the chemical properties of bottled water brands sold in the US.

4 Results

Table 1 reports the overall results. For consistency, no significance is required for MA(2) tests and Sargan statistics. As the lower half of the table reveals, the result passed both tests. That is, there are no serial correlations and specification errors, thus confirming the result's reliability[6].

As expected, the price coefficient α was negative and significant. The coefficient of Sjg is σ, which represents the correlation of preference within the group; this value should lie between $0 \leq \sigma < 1$ (Berry (1994)). My results yielded the value of 0.917, which lies in the appropriate range and indicates a strong correlation within the group. Among many other significant variables, the impact of sodium and hardness were clearly negative. I think this result is plausible because many people are aware of the effects of sodium on health, which was listed as an ingredient on the label. Furthermore, the fact that soft water is preferred to hard water is also relevant because investigations revealed that a significant portion of popular brands sell soft water. TDS results were

[6]In addition, there was virtually no change in results when I checked the robustness by increasing the value of s.

Table 1: Result

	(1)
VARIABLES	Share
Price	-0.566***
	(0.143)
Sjg	0.917***
	(0.0783)
pH	0.602**
	(0.248)
Sodium	-0.00860***
	(0.00234)
Hardness	-0.0205***
	(0.00375)
TDS	0.00895***
	(0.00182)
Flavor	1.138
	(0.767)
Foreign	0.523
	(0.610)
Public	0.0297
	(0.499)
CRM	-0.368***
	(0.104)
M1	-1.29
M2	-1.26
Sargan	52.05
	(0.394)
Observations	2,560
Number of BRID	128

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Result2

	(1)
VARIABLES	Share
Price	-0.556***
	(0.147)
Sjg	0.920***
	(0.0769)
pH	0.629**
	(0.255)
Sodium	-0.00870***
	(0.00229)
Hardness	-0.0205***
	(0.00387)
TDS	0.00898***
	(0.00187)
Flavor	1.185
	(0.778)
Foreign	0.529
	(0.641)
Public	0.0117
	(0.487)
CRM	-0.408**
	(0.166)
M1	-1.32
M2	-1.35
Sargan	54.29
	(0.314)
Observations	2,560
Number of BRID	128

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Result3

VARIABLES	(1) s= 2	(2) s = 3
Price	-0.556***	-0.535***
	(0.131)	(0.140)
Sjg	0.885***	0.925***
	(0.0493)	(0.0585)
pH	0.582***	0.681***
	(0.225)	(0.217)
Sodium	-0.00853***	-0.00880***
	(0.00198)	(0.00225)
Hardness	-0.0202***	-0.0209***
	(0.00298)	(0.00370)
TDS	0.00880***	0.00914***
	(0.00148)	(0.00181)
Flavor	0.986	1.439**
	(0.634)	(0.578)
Foreign	0.514	0.681
	(0.514)	(0.499)
Public	0.110	0.0852
	(0.458)	(0.430)
CRM	-0.420**	-0.469**
	(0.166)	(0.206)
M1	-3.48	
M2	-6.26	0.40
M3		-0.67
Sargan	2358.13	10.15
	(0.000)	1.000
Observations	2,560	2560
Number of BRID	128	128

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

rather different from what was anticipated. As this variable possesses the same ingredients as hard water, I expected that their coefficient signs would be the same, or that one or the other would prove not significant. The result revealed, however, that TDS is positive and significantthe opposite of hardness. Since TDS is an important factor in giving water its unique taste, I interpreted this result to conclude that a product whose water is different from other products can attain its market share on this factor alone. On analyzing explanatory variables other than chemical properties, flavor has a positive but insignificant effect. Moreover, it is interesting to see how water sources affect product demand because, from the perspective of environmental issues or free-riding, many citizen groups criticize companies that use public water systems as their water source. The result demonstrated that products that source their water from the public water system receive a marginally negative evaluation from consumers, but the coefficient is insignificant. This outcome may reflect the fact that the taste differs depending on the source, or it may express consumer antipathy toward public water source usage.

The most surprising aspect of the estimation results is the negative and significant coefficient of CRM. Of course, I had anticipated that this might occur because my research question is the risk of the overestimation created by using artificial data. However, the result surprised me because I was of the opinion that a positive but smaller(or even insignificant) estimate was more likely, considering that most previous research had detected a positive and significant coefficient. A straightforward interpretation of this result is that CRM has a negative impact on sales, and it suggests that many consumers oppose such campaigns. Recently, the bottled water industry has come under severe criticism, largely regarding environmental protection, and therefore is highly probable that its critics perceive CRM as a ruse to make profit, rather than an authentic charitable activity. In fact, many negative opinions were gathered toward CRM during data collection. In addition, such opponents need not constitute the majority; the result also reflects those who can be considered neutral, wherein they were unaware about the campaign, or, if they did know, it did not influence their brand selection. Even so, I found the results rather surprising.

Hereafter, I give careful consideration to the fact that this study was based on observational data. First, I eliminated a number of variables and re-estimated the equation to check the robustness of the estimates, but the results remained fundamentally unchanged. Second, I tested my definition of the CRM dummy. As previously noted, because my data was provided only at the quarterly level, the CRM dummy was defined inaccurately. To eliminate the possible resultant bias, I attempted at another specification that defined the CRM dummy differently, taking one only if a product has two or three months of CRM in a quarter [7]. The result in Table 2 demonstrates that the estimates remained fundamentally unchanged. I also checked other settings, but found no significant difference. Therefore, I confirm that the construction of the variable does not

[7] In my opinion, this majority setting is another natural construction of the CRM dummy for my data.

strongly influence my estimates. Finally, I checked for possible CRM endogeneity. Companies can use CRM as a countermeasure against negative demand shock, and so the result might reflect endogeneity bias from this behavior[8]. Ideally, this problem should be resolved using an exogenous instrumental variable correlated with CRM but not correlated with its demand. However, because such an instrumental variable is unobtainable, I treated the CRM dummy in the same way as p and sj/g, and re-estimated the equation. Table 3 reports the result. Unfortunately, as can be seen from column (1) of the table, when s = 2, the M2 test result is significant. In addition, the maintained hypothesis was rejected. However, this issue could be resolved by taking longer lags and discarding shorter lags. Fortunately, with s = 3 (column (2)) there was no serial correlation, and the hypothesis was not rejected, while the results were unchanged.

Despite sufficient statistical controls, the results are very robust. I can confidently state from the results that the negative coefficient does not come from statistical problems and negative feedback toward CRM is a more plausible explanation for the negative coefficient. However, if experiments are more realistically designed, one might identify the impacts of ethical attributes in the real world more precisely than done in this study. We should wait for the implementation of such studies before reaching any conclusion .

5 Conclusion

Measuring the effect of ethical attributes on market outcomes is important to determine whether both economic and altruistic purposes can be pursued simultaneously. Although many researchers have addressed this topic, they used data in virtual situations, and not in the real marketplace. In this study, I provided evidence from the real marketplace based on scanner data and actual campaigns conducted in the US bottled water market. Surprisingly, the results revealed a negative effect of CRM on sales, opposed to prior research using survey or experimental data. This finding can be explained by the negative responses of skeptical consumers. Because a number of people object to ethical labels on the grounds that such labeling is motivated by profit and not by social welfare, I believe that the results are realistic. In addition, the bottled water industry came under severe criticism by environmentalists during the study period. These background conditions may have caused negative attitudes toward CRM, which is often considered a ruse for increasing corporate profit. Of course, using market data increases the possibility of estimation bias. With more sophisticated experiments, this issue may be treated more effectively, producing results that differ from those indicated in this study. Although my results seem robust, we should await the research findings of other studies.

It is most important to determine whether the negative result is market specific. It is possible that the (positive) effect declines or enters the negative

[8]In reality, the decision to implement a CRM campaign is usually made long before its implementation. Therefore, I believe that this problem is unlikely, and I confirm that below.

range as time passes if consumers become indifferent to, or skeptical about, ethical campaigns. For example, consumers may begin to think that CRM is a profit-oriented campaign because of its long-term duration. Because my data differs from that of other researchers in terms of the data span, the difference in findings may result from such a declining effect which influences my sample more heavily than those of others. If the study's duration explains the difference, it implies that short-term CRM campaign success does not guarantee long-term success. However, if such an effect does not occur, industry specific factors might change the effectiveness. Thus, it is important that future studies clarify the effect in other industries and in different campaign time-spans to determine whether we can pursue two-seemingly unrelated purposes simultaneously.

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