

THE ROLE OF REGULATORY DISCLOSURE IN CAUSE MARKETING

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Abstract

Disclosure requirements on firms that engage in cause marketing (CM) vary widely across states in the U.S. We consider the impact of such disclosure requirements on firms, donations to causes, and consumer welfare in a signaling game. To motivate the assumptions of the model, we conduct a survey to establish that consumers respond positively to altruistic firm motives. The model features two types of firms, virtuous and strategic, with the virtuous firm more willing to donate to a cause than a strategic firm in a full-information world. Consumers do not know the type of the firm, but update their beliefs either from the price of the product (when disclosure requirements are lenient) or from both the price and the proportion of proceeds being donated (when disclosure requirements are strict). We find that strict disclosure requirements allow the virtuous firm to separate from the strategic firm more efficiently, and lead to higher donations to causes and higher consumer welfare.

Keywords: *cause marketing; charitable donation; corporate social responsibility; information disclosure; signaling game; state regulations.*

Introduction

Cause marketing (CM) is ubiquitous, with corporations large and small donating some money from their sales to charitable causes. In North America alone, firms' spending on CM is projected to reach \$2.06 billion in 2017, representing an annual growth rate of 4%.¹ Despite the widespread use of CM, there is wide heterogeneity in disclosure by firms about how much they donate in any given campaign. For example, Ethos Water clearly announces that each time you buy a bottle, "you contribute \$.05US (\$.10CN in Canada) to the Ethos Water Fund to help support water, sanitation and hygiene education programs in water-stressed countries." In this case, transparent disclosure enables consumers to make informed decisions. In contrast, Gap says that it will donate 50% of profits from selling Product Red items to The Global Fund to fight AIDS, and Apple announces "Every purchase of iPhone 7 Product Red Special Edition contributes to the Global Fund to support HIV/AIDS programs." Each year during Breast Cancer Awareness Month, many companies benefit from so-called "pinkwashing" because they either promote breast cancer awareness without donating at all, are deceptive in their campaign promises, or are not transparent about where their donations go (Forbes 2011). As such, it can be very difficult for a consumer to determine how much is contributed to the cause when they purchase a product.

Disclosure requirements for firms in the U.S. vary widely by geographical location. As we show in the next section, 24 U.S. states have laws regulating commercial co-venturers (CCVs), or firms that conduct charitable sales promotions. The remaining states have no CCV laws. Even among the 24 states that do have a CCV law, disclosure requirements vary quite a bit.

¹ See the IEG sponsorship report, available at <http://www.sponsorship.com/IEGSR/2017/01/04/Sponsorship-Spending-Forecast--Continued-Growth-Ar.aspx>.

In this paper, we build a theoretical model to study the effect of laws governing CM disclosure on firm actions, donations to causes, and consumer welfare. To build a foundation for the model, we first conduct an online survey. The survey reveals that, consistent with findings in the prior literature, consumers care about firm motive in that they are more likely to purchase products from a firm that does cause marketing for altruistic reasons (versus only for earning a profit). Using this foundation, we then construct a theoretical model to examine the role of regulatory disclosure on CM.

Consistent with extant literature (e.g., Ho et al. 2006a, 2006b; Jiang et al. 2014), we consider a signaling model with two firm types, a virtuous-type that engages in CM for altruistic motives, and a strategic-type that does CM purely to maximize its profit. Consumers derive a higher utility from transacting with the virtuous firm, so that if the consumers knew the firm type, the virtuous firm would face a higher demand (and so have greater revenue potential) than the strategic firm. We consider two legal regimes: a strict regime with verifiable disclosure of the donation amounts, and a lenient regime where donation levels are non-verifiable (due to either the absence of laws and regulations or a lax enforcement of such laws). In a lenient regime, the virtuous firm has no credible way to voluntarily disclose its donation behavior. Therefore, consumers can only use the price of the product to update their beliefs over firm type. In contrast, in a strict regime, donations are directly verifiable, so consumers can also learn about firm type both from the price of the product and the proportion of proceeds being donated.

We consider the least-cost separating equilibrium in each legal regime. In the lenient regime, we find that the virtuous firm distorts its price away from the full-information level. Interestingly, in the strict regime, the virtuous firm distorts its donation proportion, but retains the same price as under full information. Although two signals are available in the latter case

(price and donation amount), the virtuous firm uses only one signal in the least-cost separating equilibrium. The intuition is as follows. Suppose consumers do not know the type of the firm, but infer it from the price. If the strategic firm copies the price of the virtuous firm, it obtains exactly the same revenue as the virtuous firm. In contrast, the different firms would optimally choose different donation proportions in this scenario. Thus, copying the donation proportion of the virtuous firm is more costly for the strategic firm, making donations a more effective signaling device.

In the lenient regime, the virtuous firm retains the same donation level (as a proportion of revenue) as under full information. But due to the distortion in price, its revenue and total donation amount are lower than under full information. In contrast, in the strict regime, the virtuous firm recovers its full-information revenue, but may have to increase its donation proportion. The strategic firm makes no donations in a separating equilibrium. As a result of these factors, the strict regime leads to greater overall donations to causes. We also find that in the lenient regime, consumer surplus is lower than the full-information scenario as a result of the distorted price. Consumer surplus recovers to the full-information amount in the strict regime as price is no longer a signal for firm type.

Our work provides important insights for firms, non-profit entities, as well as policy makers. We contribute to the literature on CM by examining the effects of legislative requirements on firms' involvement in CM initiatives, and the subsequent impact on charitable giving and consumer welfare. Our work implies that the lack of state laws and regulations is a potential driver of increased cost for firms that truly care about giving back to the society. This is because strategic firms can take advantage of consumers' goodwill towards socially-responsible firms, and the difficulty that can arise for consumers in distinguishing between different types of firms.

We also contribute to the literature on the roles of government-enforced information disclosure in various markets. From a modeling perspective, we capture consumer responses to different firm motives and allow for two signals (product price and donation level) in an analytical, theoretic framework.

Now we elaborate on the related literature. CM is a particular activity related to corporate social responsibility (CSR). A stream of the marketing literature studies whether and how CSR initiatives can generate positive stakeholder relations for businesses. Different CSR activities, e.g., cause marketing, green marketing, corporate philanthropy, and socially responsible employment and manufacturing practices, can be differentially valuable to stakeholders such as employees and consumers (see Pelozo and Shang, 2011, for a comprehensive review). There is experimental and empirical evidence that positive CSR associations can enhance consumers' perceptions about a company and its brand (Brown and Dacin 1997; Sen and Bhattacharya 2001; Sen, et al. 2006). Consumers' social responsibility preferences in turn affect the incentives of firms to produce socially responsible goods (Iyer and Soberman 2016).²

Turning to cause marketing, a 2017 Cone Communications study finds that, at a comparable price and quality, 89% of Americans are likely to switch brands to one that is associated with a good cause, an increase from 66% in 1993.³ A 2012 Edelman study finds that 72% of consumers from 16 countries are more likely to spread the word on social media for a brand that supports a good cause over one that does not.⁴ While these studies are based on consumer surveys,

² Related to this stream of literature, there is also growing research focusing on the effects of various charitable giving appeals (e.g., List and Lucking-Reiley 2002; Karlan and List 2007), social pressure (e.g., Shang and Croson 2009; Della Vigna et al. 2012), as well as sympathy and framing (e.g., Sudhir et al. 2016) on charitable giving.

³ Cone Communications website: <http://www.conecomm.com/research-blog/2017-csr-study#download-the-research>.

⁴ The goodpurpose® study by Edelman: <http://www.edelman.com/insights/intellectual-property/good-purpose/>.

theoretical and experimental academic research too has shown that CM can positively influence consumers' attitudes, brand preferences, purchase intention, and willingness to pay (Arora and Henderson 2007; Haruvy and Popkowski Leszczyc 2009; Krishna and Rajan 2009; Henderson and Arora 2010). In addition, the outcomes of CM campaigns are influenced by factors such as firm donation amount, donation-related and cause-related customer predispositions, and the fit between the firm and the cause (Koschate-Fischer et al. 2012).

Although in general CM is good for the firm, one should also note that *perceived firm motives* to engage in CM can significantly impact consumers' attitudes towards the campaign and the firm. If the consumers feel that the firm is exploiting the cause or consumers, the campaign can backfire (Varadarajan and Menon 1988; Brown and Dacin 1997; Barone et al. 2000; Becker-Olsen et al. 2006; Ellen et al. 2006). For instance, Ellen et al. (2006) show that consumers' attribution for CSR (such as CM initiatives) plays an important role in their responses. In particular, consumers react negatively to "egoistic" motives of firms -- where the firms' motive is to take advantage of others, or when firms engage in CM initiatives only in response to stakeholder requirements. Similarly, Becker-Olsen et al. (2006) find that CSR initiatives that are profit-motivated negatively impact consumer beliefs, attitudes, and intentions.

While CM has significant impact on firms, consumers and causes, to our knowledge, there is scant research on the effects of laws that regulate CM campaigns. This is what we focus on in this paper. On this front, our work also contributes to the literature on the roles of government-enforced information disclosure in various markets, such as the healthcare and the food industry (e.g., Sage 1999; Jin and Leslie, 2003). Interestingly, although information economics predicts that market forces can lead to voluntary disclosure by businesses, little voluntary disclosure is observed in the field (Jin et al. 2015). Under such circumstances, mandatory disclosure is

designed to protect consumers by allowing them to make informed decisions. For example, the posting of hygiene grade cards in restaurant windows in Los Angeles caused a 20% reduction in the number of people admitted to hospitals with food-related illnesses (Jin and Leslie, 2003). In contrast, in a related investigation into the effects of laws and regulations on market outcomes, Goldfarb and Tucker (2011) find that after the European Union passed laws to protect consumer privacy by restricting online tracking techniques, display advertising became far less effective. Similar to these seemingly conflicting findings, regulating CM campaigns and other CSR initiatives can potentially lead to complex market outcomes, some positive and some negative. In this paper, we take the first step to investigate the role of regulatory disclosure in cause marketing.

The rest of this paper is organized as follows. In the next section, we briefly discuss the heterogeneity in state-level CCV laws in the U.S. We then report the results of our online survey. Next, we present the model and our analytic results. In the last section we present our conclusions and the limitations of our research.

CCV Laws in the U.S.

At present, twenty-four states in the U.S., including California and New York, have commercial co-venturer (CCV) laws in either their charitable solicitations statutes (i.e., laws for getting charitable donations) or their consumer protection statutes (i.e., laws for protecting consumers) (see Table 1 for details). These laws vary by state, but typically include reporting, contracting, disclosure, and registration requirements for the firms promising to donate a portion of their sales. Regardless of the specific wording, CCV laws generally share a common purpose to

protect consumers and charities against fraudulent or misleading charitable sales promotions, and to help assure that promised donations are delivered to the proper place.

Insert Table 1 about here

The CCV laws are triggered by firms making representations to the public; i.e., advertising that a purchase will benefit a charitable organization.⁵ For example, New York state defines a “commercial co-venturer” as “any person who for profit is regularly and primarily engaged in trade or commerce other than in connection with the raising of funds or any other thing of value for a charitable organization and who advertises that the purchase or use of goods, services, entertainment, or any other thing of value will benefit a charitable organization.”⁶ By this definition, anyone who engages in charitable sales promotions in New York is considered a “commercial co-venturer” and is subject to the regulations of the state CCV laws.

Among the twenty-four states that have CCV laws, twelve (including Arkansas, Connecticut, Massachusetts, New Jersey, and New York) require campaign ads to disclose the amount of donation on a per-unit basis, typically either *as a dollar amount per unit* or *as a percentage of the sales price*. That is, in these twelve states, firms have to reveal that they are donating, say, “\$1.00 per box” or “5% of the purchase price” to the specified charitable organization – in both cases, consumers can determine exactly how much is being donated to a cause from a sale of the

⁵ Alternatively, the company can give a fixed amount to charity while claiming it is a proud sponsor. An advantage of this approach is that it generally avoids the need to comply with CCV laws. Note that advertising law principles also apply to CM campaigns. Relevant statutes prohibit deceptive, misleading, and unfair advertising concerning the firm’s cause marketing campaign. (Kyle-Beth Hilfer on July 7, 2014 <http://kbhilferlaw.com/legal-rules-cause-marketing/>).

⁶ State of New York, Department of Law, “Solicitation and Collection of Funds for Charitable Purposes,” Executive Law, Article 7-A.6.

product. These represent the “strict regime” with the most concrete disclosure requirements regulating the transparency of CM campaigns.

In states that lack such CCV laws, CM campaigns do not need to be transparent. In these states, it is very difficult for consumers to be certain about how much (from the product sale) is being donated to the charity. For example, firms can use vague disclosures such as “a portion of the purchase price” or “a percentage of our net profits” and still be considered legal. Even a concrete-sounding disclosure such as “50 percent of net profits” allows a firm a lot of room to determine which items to include as costs in the process of computing firm profits. Furthermore, firms may have hidden contribution caps or maximal donation amounts. Thus, when effective regulation is lacking (either due to the absence of laws or a lax enforcement of laws) to ensure accurate information disclosure, CM claims are practically non-verifiable from a consumer’s perspective. We call this a “lenient regime” in our model. Figure 1 below shows an example of a vague CM campaign that is considered legal in a lenient regime.

Figure 1 about here

These are the two extremes of transparency in disclosure. The 12 states where CCV laws are less strict (e.g., California, Florida and Illinois) fall in the middle. For instance, in the state of California, although the CCV laws require (1) a contract between the firm and the charity, or (2) a campaign registration and periodic report to the State Attorney General, the firm does not need to make a concrete disclosure to the public. Rather, it only has to announce that the purchase “will benefit the trustee or charitable corporation or will be used for a charitable purpose.” In this paper, for greater insight into the effect of CCV laws, we consider the two extremes: the strict regime vs. the lenient regime.

Amazon Mechanical Turk Survey

In this section, we report the results of an online survey conducted via Mechanical Turk on Amazon. The goal of the survey is to assess consumers' beliefs and responses to CM campaigns. Prior studies have focused on the effects of CM on cause-related products, brands and firms, as well as factors (such as cause-firm fit) that may moderate these effects. However, to the best of our knowledge, little is known about consumers' beliefs about firm motives and their purchase intention given signals such as product price or donation amount.

One hundred and fifty-one respondents from across the United States filled out the survey for a reward of \$1.50. Our objectives with the survey are threefold. First, we want to verify whether consumers indeed perceive that there are various types of CM campaigns, some transparent and others vague, i.e., while we know that there is heterogeneity in donation disclosure across CM campaigns, whether consumers perceive this to be so. Second, we want to assess whether consumers respond more positively to a firm with altruistic motives (as opposed to a profit-motivated firm). Third, we want to know how perceived donation is related to price when donations are not transparent. As such, we included the following questions in the survey:

- *Q1. Please divide 100 points between the following three types of cause marketing campaigns you may have observed in your experience. The number of points you give should reflect how frequently you have seen that campaign type – so, you can give 0 points if you have never seen one of these campaign types; you can also give 100 points if you have only seen one of these campaign types; etc.*

_____ *Campaign type 1: The firm clearly discloses the amount of donation. For example, “5% of the proceeds will be donated if you purchase this product.” Or “\$2 will be donated if you purchase this product.”*

_____ Campaign type 2: The firm is vague about the amount of donation. For example, “A portion of the proceeds will be donated if you purchase this product.”

_____ Campaign type 3: The firm only tells customers that they make donations to a charity, but does not mention the amount. For example, “We are proud supporters of charity XYZ.”

- Q2. Imagine that consumers cannot verify how much firms donate to charity for each sale. Firm A charges \$35 for a t-shirt, and firm B charges \$25 for a similar t-shirt. Which firm do you think donates more of its proceeds to charities? (And then explain why?)

After survey respondents answered these questions, they reported on a 7-point scale how much they agreed with five statements regarding firm motives and consumer responses to CM campaigns. In particular, statement #3 reads: “Customers are more likely to purchase from a firm if they believe that it truly intends to give back to the society.” Finally, they filled out some demographic information -- gender, age, education, and the state they currently live in. Our survey participants were quite mixed in demographics (64% male; 48% under 31 and 12% above 50 years old; 28% with a high school degree and 11% with a post-graduate degree). Demographics were not related to any of the key answers (p -values > 0.1), and we do not explore them further.

Answers to Q1 indicate that our respondents believe that transparent campaigns (i.e., campaign type 1) account for about 46% of the CM campaigns (Mean = 45.92, SD = 25.46), vague campaigns (i.e., campaign type 2) account for about 31% (Mean = 31.02, SD = 19.56), and opaque campaigns (i.e., campaign type 3) account for about 23% of campaigns (Mean = 23.06, SD = 18.31). This provides evidence that, from consumers’ perspective, in the marketplace

various types of campaigns co-exist. Due to the sample size, however, we are not able to test differences across different U.S. states.

In Q2, 84.77% of the respondents believe that Firm A (the higher priced firm) donates more than Firm B. The main reasons provided by the respondents include:

- *Firm A earns more profit, so it is able to donate more.*
- *The purpose of charging a higher price is for making more donations.*
- *I assume firms typically donate a certain percentage ... of their proceedings to charity.*
- *Firm A donates more to justify its higher price.*
- *This is a morally responsible thing for Firm A to do.*

This finding suggests that when a CM campaign is vague (i.e., donation amount cannot be verified), consumers tend to associate higher product prices with higher firm donation amount.

Most importantly, for statement #3 “*Customers are more likely to purchase from a firm if they believe that it truly intends to give back to the society*”, the mean score was 5.41 (SD=1.11), which is in-between “Somewhat agree” and “Agree”. This is consistent with the idea that consumers care about and respond positively to altruistic firm motives in a cause marketing context (see also Ellen et al. 2006; Becker-Olsen et al. 2006). Survey results also indicate that consumers are somewhat suspicious of firm motives when they are involved in cause marketing. For the statement “*All firms that do cause marketing are intrinsically interested in being socially responsible*” (1=strongly disagree, 7=strongly agree), the mean score for the 151 respondents was 3.53 (SD=1.51), which is in between “somewhat disagree” and “neutral”.

Overall, our survey results indicate that (a) consumers recognize there is some heterogeneity in CM campaigns, (b) consumers associate higher prices with a firm donating a larger amount to a cause when the CM campaign is vague about donation amount, and (c) consumers respond

more positively to a CM campaign if a firm donates out of altruistic motives. Our analytical model incorporates these features.

Analytical Model and Results

We construct a signaling model in which consumers' purchase decisions about a product are influenced by a firm's altruistic motivations to make charitable donations. The firm may be either a virtuous-type (θ_v) or a strategic-type (θ_s), where θ_i denotes the firm's ideal donation level (i.e., preferred donation amount as a percentage of its revenue). $\theta_v > \theta_s$, as the virtuous firm are more altruistic than a strategic firm. The prior probability that the firm is of the "virtuous" type is μ_0 , and of the "strategic" type is $1-\mu_0$.

Based on what they have observed, consumers form a posterior belief $\hat{\theta}$ about the type of the firm. If the price of the product is p , the demand for the product is given by

$$q(p, \hat{\theta}) = a(1 + \hat{\theta}) - b p, \quad (1)$$

where a and b are both strictly positive. That is, the intercept of the linear demand curve increases with the probability that the firm is of the virtuous-type. This captures the notion that consumers respond more positively to a CM campaign if a firm donates out of altruistic motives, as opposed to a firm that engages in CM purely for strategic purposes (i.e., survey result (c); prior studies such as Ellen et al. 2006 and Becker-Olsen et al. 2006). Therefore, at any given price, consumers are willing to purchase a greater quantity from the virtuous firm.

For convenience, we normalize the cost of production to be zero. The revenue of the firm is $p q$. The firm potentially cares both about post-donation profit and a cause. Specifically, let γ denote the proportion of revenue that is donated to a cause. The amount of profit returned to the shareholders is then $(1 - \gamma) p q$. The firm with type $\tilde{\theta}$ has a utility function

$$U_{\tilde{\theta}}(p, \gamma) = (1 - \gamma) p q - \alpha(\gamma - \tilde{\theta})^2 p q. \quad (2)$$

Recall that $\tilde{\theta}$ may be thought of as the firm's ideal donation percentage and reflects the firm's type. If the actual donation percentage γ exactly equals the ideal percentage $\tilde{\theta}$, then the term $\alpha(\gamma - \tilde{\theta})^2 p q$ reduces to zero. In this case, the firm's utility is equal to the profit net of the donation amount. However, if the actual donation percentage deviates in either direction from the ideal donation percentage, the firm suffers some disutility. The parameter $\alpha > 0$ affects the size of this disutility. Since $\tilde{\theta}$ is based on whether the firm is virtuous or strategic, and already captures firm-type, for ease of exposition, we assume α to be the same for the virtuous and strategic firms. Going forward, for convenience, we refer to $U_{\tilde{\theta}}(p, \gamma)$ as the utility of the firm with type $\tilde{\theta}$.

We consider two legal regimes – the two extreme scenarios existing in the U.S. that we discussed earlier. In the strict regime, or *verifiable* donations case, CCV laws require that the actual per-unit donation percentage be revealed to consumers, so that the consumers directly observe γ . They can therefore update their beliefs about the type of the firm, based on both the price of the product, p , and the donation percentage γ . Conversely, in the lenient regime, or *non-verifiable* donations case, there is no requirement that the firm disclose γ . We assume that due to lack of regulation or enforcement, even a voluntary disclosure by the firm may not be credible in this regime. Therefore, consumers must form their beliefs about the type of the firm only based on the price of the product.

Full-information Case

Before we develop our main signaling model where consumers infer firm type (virtuous or strategic) from price and donation amounts, we first develop a simpler benchmark model where consumers know the firm type – i.e., the full-information model. In this full-information model,

if the firm is of type $\tilde{\theta}$, the posterior belief of consumers, $\hat{\theta}$, is equal to $\tilde{\theta}$. Notice that we can write:

$$U_{\tilde{\theta}}(p, \gamma) = \{1 - \gamma - \alpha(\gamma - \tilde{\theta})^2\} \times p q. \quad (3)$$

In the full-information case, we can further write $q = a(1 + \tilde{\theta}) - bp$, which is independent of γ . The first-order condition with respect to γ directly yields $\gamma_{\tilde{\theta}}^{Full} = \max\{0, \tilde{\theta} - \frac{1}{2\alpha}\}$. Similarly, the first-order condition with respect to price yields $p_{\tilde{\theta}}^{Full} = \frac{a(1+\tilde{\theta})}{2b}$. It is straightforward to verify that the respective second-order conditions are satisfied.

For the rest of this paper, we set $\theta_s = 0$ for the strategic firm and $\theta_v = \theta \in (\frac{1}{2\alpha}, 1)$ for the virtuous firm. Thus, under full information, the virtuous firm will choose to donate a positive amount, whereas the strategic firm will not make a donation to the cause. The actual donation level of the virtuous firm is $\gamma_v^{Full} = \theta - \frac{1}{2\alpha} > 0$, which is lower than its ideal donation level θ .

This is because in determining its overall utility, the firm trades off the donation with its own profit -- raising the donation level reduces the share of the profit returned to the shareholders. In contrast, the strategic firm has no incentive to donate ($\gamma_s^{Full} = \theta_s = 0$), because under full information its type is already known to consumers.

Table 2 below summarizes the solution in the full-information scenario.

Insert Table 2 about here

Signaling Game

We now turn to our main model, where consumers infer firm type from price (non-verifiable case) or from both price and donation amount (verifiable case). The timing of the game is as

follows. Each type of firm i chooses a price p_i and a donation percentage γ_i . In the non-verifiable donations case (i.e., with lenient disclosure regulations), consumers observe only the price.⁷ They update their beliefs based on the price, and determine the quantity of the good they will buy, q_i , as given by equation (1). This results in a pre-donation profit $p_i q_i$ for firm i , and a utility $U_i(p_i q_i)$ as given by equation (3).

In the verifiable donations case (i.e., with strict disclosure regulation and strict enforcement), consumers observe both the (verifiable) donation percentage and the product price. They use both to update their beliefs and determine the quantity they will buy. Given consumers' posterior beliefs, the firm's utility is then determined as in the non-verifiable donations case.

We consider Perfect Bayesian Equilibria (PBE) of this game. That is, each type of firm plays a best response given consumers' beliefs. Consumers' beliefs about firm type, in turn, must be determined using Bayes' law and firm strategies where feasible (i.e., for any prices or donation percentages observable in equilibrium). To elaborate, in the lenient regime non-verifiable donations case, PBE imposes no restriction on consumer beliefs about firm type when prices are off the equilibrium path. In the strict regime verifiable donations case, consumers form beliefs about firm type after seeing both prices and donation percentages, i.e., over (p, γ) pairs; again, PBE imposes no restriction on consumer beliefs about firm type when price-donation pairs are off the equilibrium path.

We focus on the *least-cost separating equilibrium* in each case. Our focus on separating equilibria is motivated by the heterogeneity we observe in firms' engagement with cause marketing -- in a pooling equilibrium, each type of firm has the same price and the same donation percentage. The least-cost separating equilibrium is a separating equilibrium in which

⁷ Alternatively, when donation level is non-verifiable, only product price serves as the signal of firm type.

the virtuous-type earns a greater utility than in any other separating equilibrium. As is known, and as we show formally in the proofs of the propositions below, it is the only separating equilibrium that survives the Intuitive Criterion of Cho and Kreps (1987).

We make the following assumption on the parameters θ , the ideal donation percentage of the virtuous firm, and α , the disutility parameter when the firm donation deviates from its ideal level.

Assumption 1. (i) $\theta \in (0,1)$

$$(ii) \frac{1}{2\theta} < \alpha \leq \frac{2(3-\theta^2)}{\theta(1+\theta)^2}$$

Part (i) merely restricts the ideal donation percentage of the virtuous-type firm to be between 0 and 1. The first inequality in part (ii) ensures that the condition $\theta > \frac{1}{2\alpha}$ (necessary to ensure a positive donation by the virtuous-type firm under full information) is satisfied. The second inequality is required in the proof of Proposition 2 for the case of verifiable donations, to ensure that the strategic-type firm does not want to deviate.

Non-verifiable donations. When donations are non-verifiable (in the lenient regime), the firm has no credible way to reveal the amount it donates. In such a setting, there is no benefit from disclosing the donation percentage, because consumers will ignore such disclosures. This is equivalent to donation levels not being disclosed at all.

Consider a separating equilibrium of the game. It is straightforward that the strategic firm must obtain a utility at least as high as it does under full information, because it can credibly reveal itself to be the strategic-type and obtain the utility shown in Table 2. Now consider the virtuous firm -- to separate from the strategic-type firm, the virtuous-type firm must distort its price away from its full-information price.

We show that there are two separating equilibria that satisfy the Intuitive Criterion. In each equilibrium, the strategic-type firm has the same price ($\frac{a}{2b}$) and the same donation percentage (zero) as under full information. The virtuous-type firm too chooses the same donation percentage as under full information ($\theta - \frac{1}{2\alpha}$). However, the price chosen by the virtuous-type firm changes.

Checking for a price level for the virtuous-type firm, such that the strategic-type firm is just indifferent between its full-information price and the price set by the virtuous-type firm (in the latter case, consumers cannot tell the virtuous from the strategic firm), we find that there are two such prices: a price higher than p_s^{Full} and a price lower than this amount. These two prices yield the virtuous-type firm the same revenue and the same utility. Therefore, the virtuous-type firm is indifferent between these two prices.

Proposition 1 *Suppose that donation amounts are not verifiable.*

(a) *There are only two separating equilibria that satisfy the Intuitive Criterion. In each*

equilibrium, $\gamma_v^N = \gamma_v^{Full} = \theta - \frac{1}{2\alpha}$, $\gamma_s^N = \gamma_s^{Full} = 0$, and $p_s^N = p_s^{Full} = \frac{a}{2b}$. The

price of the virtuous-type firm is $\bar{p}_v^N = \frac{a}{2b} (1 + \theta + \sqrt{\theta^2 + 2\theta}) > p_v^{Full}$ in one

equilibrium and $\underline{p}_v^N = \frac{a}{2b} (1 + \theta - \sqrt{\theta^2 + 2\theta}) < p_v^{Full}$ in the other equilibrium.

(b) *In each case above, the off-equilibrium consumer belief is that if $p \in (\underline{p}_v^N, \bar{p}_v^N)$, then*

the firm is the strategic-type. Otherwise, consumers believe the firm is the virtuous-type.

The proof of the proposition is in the Appendix. Mathematically, the virtuous firm can distort its price to be either higher or lower than the revenue-maximizing price to separate from the strategic firm. However, as we saw earlier in our online survey (result (b)), in a lenient regime

where donations are non-verifiable, consumers associate higher price with higher donation level, which leads to greater consumer demand. Thus, between the two pricing options, the virtuous-type firm should charge more than its full-information price. Going forward, therefore, from the two equilibria, we choose to focus on the high-price equilibrium (i.e., $\bar{p}_v^N = \frac{a}{2b} (1 + \theta + \sqrt{\theta^2 + 2\theta}) > p_v^{Full}$).

In conclusion, we show that when donations are non-verifiable, the virtuous firm has to distort its product price (instead of donation level) in order to separate. As its price is distorted to be higher than in the full-information situation (whereas the strategic firm has the same price as in the full-information case), its unit sales and revenue are lower. While the virtuous firm keeps the same donation percentage as in the full-information case, the lower unit sales also lead to a lower total donation amount. The strategic firm does not mimic the virtuous firm because of the lower sales prospect caused by the distorted higher price.

Verifiable donations. We now turn to the case of verifiable donations. In this case, by setting a positive donation percentage, the virtuous-type firm can increase the cost the strategic-type must incur to imitate the virtuous-type.

Given any price level p_v chosen by the virtuous firm, let the associated revenue of the virtuous firm in a separating equilibrium be denoted as $R_v = p_v(a(1 + \theta) - b p_v)$. Recall that θ is the ideal donation level for the virtuous firm, and that $R_s^{Full} = \frac{a^2}{4b}$ denotes the full-information revenue of the strategic firm. Now, define

$$\hat{\gamma}(p_v) = \frac{1}{2\alpha} \sqrt{1 + 4\alpha \left(1 - \frac{R_s^{Full}}{R_v}\right)} - \frac{1}{2\alpha} \quad (4)$$

$$\bar{\gamma}(p_v) = \max\{\hat{\gamma}(p_v), \gamma_v^{Full}\} \quad (5)$$

Intuitively, at any given price p_v , when θ is high, we expect that $\hat{\gamma}(p_v) < \gamma_v^{Full}$, with the converse being true when θ is low.

We show that in the least-cost separating equilibrium, the virtuous firm continues to charge its full-information price p_v^{Full} , but it may distort its donation percentage *above* the full-information level γ_v^{Full} . The strategic firm remains at its full-information price and its full-information donation level.

Proposition 2 *Suppose that donations are verifiable. Then, there is a unique separating equilibrium that survives the Intuitive Criterion. The equilibrium has the following properties:*

- (i) *The virtuous-type firm chooses $p_v^V = p_v^{Full} = \frac{a}{2b}(1 + \theta)$, and $\gamma_v^V = \bar{\gamma}(p_v^{Full})$.*
- (ii) *The strategic-type firm chooses $p_s^V = p_s^{Full} = \frac{a}{2b}$ and $\gamma_s^V = \gamma_s^{Full} = 0$.*
- (iii) *The off-equilibrium beliefs are as follows: Suppose (γ, p) is not equal to either (γ_v^V, p_v^V) or (γ_s^V, p_s^V) . Then, if $\gamma < \bar{\gamma}(p)$, consumers believe the firm is of the strategic-type. Otherwise, consumers believe the firm is of the virtuous-type.*

The proof of the proposition is in the Appendix. Essentially, our analysis shows that when the virtuous firm can potentially separate from the strategic firm using two signals (product price and donation percentage), it chooses to *only use the donation percentage*. Therefore, when firm donation is verifiable due to concrete disclosure requirements and strict law enforcement, firms will continue to charge the optimal prices as in the full-information case. However, in order to separate from the strategic firm, the virtuous firm has to donate at a level that is *the same or higher* than in the full-information case. The strategic firm still does not donate. This is quite interesting because when firm type is unknown, mandatory disclosure can either: (a) revert the market outcome to the full-information case (i.e., even without full information being there, the signals act in a way to elicit results similar to the

full-information case), or (b) encourage the virtuous firm to make an even greater donation than in the full-information case, without changing its price or sales.

Compared to the full-information level, the virtuous firm distorts only its donation percentage, and keeps its price the same. Recall that Assumption 1, part (ii), implies that the disutility parameter α , which affects the disutility from donating something other than its ideal percentage, is sufficiently low. Conversely, if this parameter were sufficiently high (say in the extreme case as $\alpha \rightarrow \infty$), one may expect that it is the price that is distorted from the full-information level, but not the donation percentage. At intermediate levels of α , the virtuous firm may choose to distort both price and donation percentage in a least-cost separating equilibrium.

Comparison Between the Three Scenarios

Now we compare the market outcomes across the three scenarios: (i) the full-information benchmark, (ii) the strict regime (donation verifiable), and (iii) the lenient regime (donation non-verifiable). In the least-cost separating equilibria, the strategic firm always chooses not to donate and set its price optimally. Therefore, we focus on the virtuous firm behavior in our analysis. The results are summarized in Table 3.

Compared to the full-information benchmark, when consumers do not know firm types and donations are non-verifiable (i.e., lenient regime), the virtuous firm has to distort its product price to a level higher than optimal. As a result, its unit sales and firm revenue decrease. Although it retains the same donation percentage as under full information, the lower unit sales also lead to a lower total donation amount.

Insert Table 3 about here

In contrast, in the strict regime, the virtuous firm charges its optimal full-information price, thus restoring its total revenue back to the benchmark level. Even without full information being there, the combination of price and donation signals act in a way to elicit results similar to the full-information case. But, things can be better still for the cause -- in order to separate from the strategic firm, the virtuous firm may donate a higher percentage of its revenue as compared to the full-information benchmark case, leading to a higher total donation amount.

The comparison across the three scenarios reveals that total donations are lower in the lenient regime versus the full-information benchmark; and higher than (or equal to) the benchmark in the strict regime. As such, the imposition of strict CCV laws does benefit the cause. Similarly, consumer surplus is lower in the lenient regime as compared to the full-information benchmark. It is restored to the same level as the benchmark in the strict regime. Furthermore, for the virtuous firm, firm utility is lower in the lenient regime than the benchmark. We also find that with all pairs of α and θ that satisfy Assumption 1, firm utility in the strict regime is higher than in the lenient regime (Appendix).

In summary, the analysis suggests that the artificially distorted product price caused by non-verifiable donations leads to negative consequences, which is an avoidable cost to the firms, the causes, and the society.

Conclusion

We use a signaling model to examine the effect of disparate state laws on firm decisions and donations to charity. We show that strict CCV laws and strict enforcement not only allow consumers to make informed decisions, but help policy makers direct more funding in favor of the charities. This is essentially caused by the co-existence of different types of firms – some are

motivated by altruistic reasons to engage in cause marketing (i.e., the virtuous firms), while others intend to take advantage of consumers' goodwill by pretending to care about giving back to society (i.e., the strategic firms). By lessening the burdens of virtuous firms, strictly enforced CCV laws allow them to separate from the strategic firms more effectively via donation, instead of by distorting prices. Artificially inflated prices are really an avoidable cost to the whole society.

We find that in the lenient regime where donations are non-verifiable, the virtuous firm needs to charge higher prices versus a benchmark full-information scenario (where consumers know the firm type) in order to signal its type. In this case, the virtuous firm also makes lower unit sales and lower revenues than in the full-information scenario. Importantly, total donation amount is also lower in this case versus the full-information case. Consumer welfare is lower than the full-information case, also due to the artificially inflated prices. Thus, lack of good signaling decreases profits for the virtuous firm, hurts the consumers, and also lowers donations for the cause.

In the strict regime where firm donations are verifiable, however, the donation made by the virtuous firm can be even higher than in the full-information case. Thus, our model verifies the intuition that stricter laws about donation disclosure increase total donations to causes; besides verifying intuition, it also shows how this comes about – when donations become verifiable signals in this market, the problems caused by artificially inflated prices are alleviated, resulting in desirable market outcomes.

Our work has its limitations. For example, we only considered the two extreme cases in terms of regulatory disclosure: lenient and strict. While government regulations that fall in

between should result in market outcomes that also fall in-between these two extremes, we suggest that future researchers explore these contexts in greater detail.

We also assume that only price and donations act as signals of firm virtue. However, firm virtue could also be ascertained through corporate advertising or other CSR activities. Thus, firms may be perceived as virtuous or strategic *a priori* and their prices and donations may serve as additional cues to impact these beliefs.

In our model, we did not consider voluntary disclosure that might be verifiable or credible. Although there is some empirical evidence that voluntary disclosure is not sufficiently prevalent and many campaigns are extremely vague (and even misleading) by design, we would like to encourage future research that explicitly consider this possibility.

Essentially, policy makers will need to weigh the benefits of state laws and regulations against the costs. Strict laws and regulations may impose added cost to firms' cause marketing efforts. If the objective of the state legislature is to encourage charitable donations for the "common good", then how much regulation is "too much" regulation? After all, CM campaigns or more generally CSR initiatives are provided on a voluntary basis by firms. Related to this point, we have noticed that some states appear to be moving in two opposite directions, with Maine repealing CCV laws a couple of years ago, and South Carolina imposing stricter regulations by adding registration requirements for CCVs. Empirical research with data from such natural experiments will be beneficial for further understanding the role of regulatory disclosure in cause marketing.

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TABLE 1: CCV Laws and Disclosure Requirements across States

State	State Commercial Co-venturer Law	Requiring Disclosure of Donation Amount on a Per-unit Basis
AL	AL Code 13A-9-71	-
AR	Ark. Code 4-28-408	Yes
CA	Gov. Code 12599.2 and Bus & Prof. Code 17510.2	-
CO	Col. Rev. Stat. 6-16-110	Yes
CT	Conn. Gen. Stat. 21a-190g	Yes
FL	Fl. Stat. 496.414	-
GA	Ga. Code 43-17-6	-
HI	Hi Stat. 467B-5.5	-
IL	14 Ill. Admin. Code 480.30	-
LA	La. Rev. Stat. 51:1901.2	Yes
MA	Mass. L. Ch. 68, sec. 18	Yes
MS	Miss. Admin. Code 1-15-3.17	-
NH	NH Stat. 7:28-d	Yes
NJ	NJ Stat. 45:17A-29(d)	Yes
NY	NY Exec. Law 173	Yes
NC	NC Gen. Stat. 131F-18 and 18 NC Admin. Code 11.0505	-
OH	Oh. Rev. Code 1716.09	Yes
OR	Or. Rev. Stat. 128.824	Yes
PA	10 P.S. 162.15	-
SC	SC Code 33-56-70, -100, -110(A)	-
TN	TCA 48-101-519	-
UT	Ut. Code 13-22-22	Yes
VA	Va. Code Ann. 57-57	-
WI	Wis. Stat. 202.11	Yes

TABLE 2: Solutions for Full-information Scenario

	Virtuous Firm $\theta_v = \theta \in (\frac{1}{2\alpha}, 1)$	Strategic Firm $\theta_s = 0$
Price	$p_v^{Full} = \frac{a}{2b}(1+\theta)$	$p_s^{Full} = \frac{a}{2b}$
Quantity	$q_v^{Full} = \frac{a}{2}(1+\theta)$	$q_s^{Full} = \frac{a}{2}$
Donation Level	$\gamma_v^{Full} = \theta - \frac{1}{2\alpha}$	$\gamma_s^{Full} = 0$
Firm Revenue (before donation)	$R_v^{Full} = \frac{a^2}{4b}(1+\theta)^2$	$R_s^{Full} = \frac{a^2}{4b}$
Firm Utility	$U_v^{Full} = \left(1 - \theta + \frac{1}{4\alpha}\right) \frac{a^2}{4b} (1+\theta)^2$	$U_s^{Full} = \frac{a^2}{4b}$
Donation	$D_v^{Full} = \left(\theta - \frac{1}{2\alpha}\right) \frac{a^2}{4b} (1+\theta)^2$	$D_s^{Full} = 0$
Consumer Surplus	$CS_v^{Full} = \frac{a^2}{8b}(1+\theta)^2$	$CS_s^{Full} = \frac{a^2}{8b}$

TABLE 3: Virtuous Firm Behavior in Three Scenarios

	(i) Full Information – Benchmark	(ii) Strict Regime – Donation Verifiable	(iii) Lenient Regime – Donation Non-verifiable
Price	$p_v^{Full} = \frac{a}{2b}(1+\theta)$	$p_v^V = \frac{a}{2b}(1+\theta)$	$p_v^N = \frac{a}{2b}(1+\theta + \sqrt{\theta^2 + 2\theta})$
Quantity	$q_v^{Full} = \frac{a}{2}(1+\theta)$	$q_v^V = \frac{a}{2}(1+\theta)$	$q_v^N = \frac{a}{2}(1+\theta - \sqrt{\theta^2 + 2\theta})$
Donation Level	$\gamma_v^{Full} = \theta - \frac{1}{2\alpha}$	$\gamma_v^V = \max\{\gamma_v^{Full}, \hat{\gamma}(p_v^{Full})\}$	$\gamma_v^N = \theta - \frac{1}{2\alpha}$
Firm Revenue	$R_v^{Full} = \frac{a^2}{4b}(1+\theta)^2$	$R_v^V = \frac{a^2}{4b}(1+\theta)^2$	$R_v^N = \frac{a^2}{4b}$
Firm Utility	$U_v^{Full} = \left(1 - \theta + \frac{1}{4\alpha}\right) \frac{a^2}{4b}(1+\theta)^2$	$U_v^V = \psi \frac{a^2}{4b}(1+\theta)^2$, where $\psi = 1 - \gamma_v^V - \alpha(\theta - \gamma_v^V)^2$	$U_v^N = \left(1 - \theta + \frac{1}{4\alpha}\right) \frac{a^2}{4b}$
Donation	$D_v^{Full} = \gamma_v^{Full} \frac{a^2}{4b}(1+\theta)^2$	$D_v^V = \gamma_v^V \frac{a^2}{4b}(1+\theta)^2$	$D_v^N = \left(\theta - \frac{1}{2\alpha}\right) \frac{a^2}{4b}$
Consumer Surplus	$CS_v^{Full} = \frac{a^2}{8b}(1+\theta)^2$	$CS_v^V = \frac{a^2}{8b}(1+\theta)^2$	$CS_v^N = \frac{a^2}{8b}(1+2\theta - 2\sqrt{\theta^2 + 2\theta})$

Figure 1: Example of A “Vague” Cause Marketing Campaign

-- “10% NET PROFITS DONATED”



Appendix – Proofs and Derivations

1. Proofs

Proof of Proposition 1

Consider the case in which γ is non-verifiable. The strategic-type chooses to set $\gamma_s = 0$ in all situations. By choosing the same price as the virtuous-type, it can obtain a revenue R_v , and hence a utility R_v . Its equilibrium utility is R_s . Therefore, the no-deviation constraint for the strategic-type is $R_s \geq R_v$. In the least-cost separating equilibrium, it must be that $R_s = R_v$. Now, $R_v = p_v(a(1 + \theta) - bp_v)$. Therefore, we have

$$bp_v^2 - a(1 + \theta)p_v + R_s = 0. \quad (1)$$

Therefore,

$$\begin{aligned} p_v^N &= \frac{a(1 + \theta) \pm \sqrt{a^2(1 + \theta)^2 - 4bR_s}}{2b} = \frac{a(1 + \theta) \pm \sqrt{a^2\theta(\theta + 2)}}{2b} \\ &= \frac{a}{2b} \left(1 + \theta \pm \sqrt{\theta(\theta + 2)} \right), \end{aligned} \quad (2)$$

Where the second equation follows from $R_s = \frac{a^2}{4b}$.

Denote $\underline{p}_v = \frac{a}{2b} (1 + \theta - \sqrt{\theta^2 + 2\theta})$ and $\bar{p}_v = \frac{a}{2b} (1 + \theta + \sqrt{\theta^2 + 2\theta})$.

Next, we need to check the no-deviation condition for the virtuous-type firm. Suppose the virtuous firm deviates to some price $p \in (\underline{p}_v, \bar{p}_v)$, and suppose that consumers believe it is the strategic-type firm. The demand obtained by the firm is then $a - bp$, so that its profit is $p(a - bp) = ap - bp^2$. The utility of the virtuous-type firm is then

$$\tilde{U}_v = (1 - \gamma - a(\theta - \gamma)^2)(ap - bp^2). \quad (3)$$

Observe that the deviation utility is maximized by setting $\gamma = \theta - \frac{1}{2\alpha}$ and $p = \frac{a}{2b}$. Therefore, the

maximized utility is $\left(1 - \theta + \frac{1}{4\alpha}\right) R_s$.

In the separating equilibrium, the virtuous firm again chooses a donation amount equal to $\theta - \frac{1}{2\alpha}$. Therefore, its equilibrium utility is $(1 - \theta + \frac{1}{4\alpha})p_v^N(a(1 + \theta) - bp_v^N) = (1 - \theta + \frac{1}{4\alpha})R_v$. The no-deviation condition for the virtuous firm also reduces to $R_v \geq R_s$. As p_v^N has been chosen to exactly satisfy $R_v = R_s$, the no-deviation condition for the virtuous firm is satisfied at both the high and the low values of p_v^N .

Conjecture an equilibrium in which $p_v^N = \bar{p}_v$, $\gamma_v^N = \theta - \frac{1}{2\alpha}$, $p_s^N = p_s^{Full} = \frac{a}{2b}$ and $\gamma_s^N = 0$. Assign the off-equilibrium belief that if $p \neq p_s^N, p_v^N$ and $p \in [\underline{p}_v, \bar{p}_v]$, uninformed consumers believe the firm is the strategic-type. Conversely, if $p \neq p_s^N$ and $p < \underline{p}_v$ or $p > \bar{p}_v$, they believe the firm is the virtuous-type. From the analysis above, it is immediate that both the virtuous and the strategic firms are playing best responses.

Consider step 1 of the Intuitive Criterion. The maximal deviation profit for either firm occurs if uninformed consumers believe the firm is the virtuous-type. Given that belief, if either type of firm deviates to a price $\tilde{p} \in [\underline{p}_v, \bar{p}_v]$ and makes the same donation amount as in equilibrium, it obtains a strictly higher utility than in equilibrium. Therefore the set of firms that will not deviate to such prices is empty. Conversely, at prices weakly below \underline{p}_v or strictly above \bar{p}_v , even if uninformed consumers believe the firm is the virtuous-type, each type obtains a strictly lower utility than in equilibrium. Therefore, the set of firms that will not deviate to such prices includes both the virtuous-type and the strategic-type. It is now immediate that the conjectured equilibrium survives step 2 of the Intuitive Criterion.

A similar analysis shows that if the virtuous-type firm prices at $p_v^N = \underline{p}_v$ and has a donation amount $\gamma_v^N = \theta - \frac{1}{2\alpha}$, and the strategic-type firm prices at $p_s^N = \frac{a}{2b}$ and has a donation amount $\gamma_s^N = 0$, we have a separating equilibrium that survives the Intuitive Criterion.

Finally, suppose there is another separating equilibrium that also survives the Intuitive Criterion. From the analysis above, this equilibrium must have a price for the virtuous-type firm such that $\tilde{p}_v < \underline{p}_v$ or $\tilde{p}_v > \bar{p}_v$. Suppose $\tilde{p}_v > \bar{p}_v$. Consider a deviation to the price $\frac{\tilde{p}_v + \bar{p}_v}{2}$. The virtuous-type firm strictly gains by such a deviation, whereas the strategic-type firm strictly loses. Therefore, at step 2 of the Intuitive Criterion, uninformed consumers must believe the firm is of virtuous-type. But this means that the virtuous-type firm has a profitable deviation, breaking the conjectured equilibrium.

A similar argument shows that there cannot be a separating equilibrium in which the virtuous-type firm has a price strictly below \underline{p}_v . ■

Proof of Proposition 2

Given a donation level and price (γ, p) , let $\mu(\gamma, p)$ denote the posterior probability that the firm is the virtuous-type, given consumers' beliefs. The beliefs stated in the proposition can then be expressed as follows: $\mu(\gamma, p) = 1$ if $\gamma \geq \bar{\gamma}(p)$, and $\mu(\gamma, p) = 0$ if $\gamma < \bar{\gamma}(p)$.

First, we show that the exhibited strategies and beliefs constitute a separating equilibrium that survives the Intuitive Criterion. We return to the uniqueness property later.

There are several steps to showing that the exhibited strategies and beliefs constitute a separating equilibrium.

Step 1: Given the beliefs, the strategic-type firm is playing a best response.

Recall that:

$$\hat{\gamma}(p_v) = \frac{1}{2\alpha} \sqrt{1 + 4\alpha \left(1 - \frac{R_s^{Full}}{R_v}\right)} - \frac{1}{2\alpha} \quad (4)$$

$$\bar{\gamma}(p_v) = \max\{\hat{\gamma}(p_v), \gamma_v^{Full}\} \quad (5)$$

By construction, the strategic-type firm earns the utility $\frac{a^2}{4b}$ if it deviates to $(\hat{\gamma}(p_v), p_v)$ for any p_v . Further, when $\hat{\gamma}(p_v) < \theta - \frac{1}{2\alpha}$, the utility of the strategic-type firm is strictly lower than $\frac{a^2}{4b}$.

Consider the strategic-type firm. By setting $p_s^V = p_s^{Full} = \frac{a}{2b}$ and $\gamma_s^V = \gamma_s^{Full} = 0$, it obtains its full-information utility, $U_s^V = U_s^{Full} = \frac{a^2}{4b}$. By definition, this utility weakly exceeds the utility it can obtain at any other values of (γ, p) such that $\mu(\gamma, p) = 0$ (i.e., consumers believe the firm is the strategic-type). Suppose the firm deviates to $(\bar{\gamma}(p), p)$ for some p . Then, consumers believe it is the virtuous-type. However, by construction, the strategic firm obtains a weakly lower utility at $(\bar{\gamma}(p), p)$ (where consumers believe it is the virtuous-type) than at $(0, p_s^{Full})$ (where consumers believe it is the strategic-type). Therefore, it cannot gain from such a deviation. Finally, suppose it deviates to some (γ, p) where $\gamma \geq \bar{\gamma}(p)$ and $\mu(\gamma, p) = 1$ (i.e., consumers believe it is the virtuous-type). Because its utility is strictly decreasing in γ , it follows that it obtains a lower utility at (γ, p) than at $(\bar{\gamma}(p), p)$, and hence than at $(0, p_s^{Full})$. Therefore, given consumer beliefs, the strategic-type firm is playing a best response.

Step 2: Given the beliefs, the virtuous-type firm is playing a best response.

Consider the virtuous-type firm. There are a few sub-steps here.

Step 2.1: Suppose that, given a price level p , the virtuous-type firm sets a donation level $\bar{\gamma}(p)$.

Then, its optimal price is p_v^{Full} .

First, we show that among all donation and price levels $(\bar{\gamma}(p), p)$, the virtuous-type firm maximizes its utility at $(\bar{\gamma}(p_v^{Full}), p_v^{Full})$. Over all such donation and price levels, the firm's utility function may be written as $U_v(p) = \left(1 - \bar{\gamma}(p) - \alpha(\theta - \bar{\gamma}(p))^2\right) \times p(a(1 + \theta) - bp)$.

Let $R_v = p(a(1 + \theta) - bp)$. Then, there are two cases to consider:

(a) For some parameter values, $\bar{\gamma}(p_v^{Full}) = \theta - \frac{1}{2\alpha}$. Then, it is immediate that the virtuous-type firm's optimal price is p_v^{Full} . At this price, the firm earns its full-information utility, and by definition it cannot earn more in any equilibrium.

(b) For some other parameter values $\bar{\gamma}(p_v^{Full}) = \hat{\gamma}(p_v^{Full})$. We first show that $\hat{\gamma}(p)$ is maximized at $p = p_v^{Full}$ and the maximal value $\hat{\gamma}(p_v^{Full})$ is strictly less than θ . We then argue that over all (γ, p) pairs such that $\gamma = \bar{\gamma}(p)$, the virtuous-type firm maximizes its utility at $p = p_v^{Full}$.

To see the first point, observe that $\frac{\partial \hat{\gamma}(p)}{\partial p} = \frac{\partial \hat{\gamma}(p)}{\partial R_v} \frac{dR_v}{dp}$. By inspection, $\frac{\partial \hat{\gamma}(p)}{\partial R_v} > 0$. Therefore, when maximizing $\hat{\gamma}(p)$, the first-order condition is satisfied only when $\frac{dR_v}{dp} = 0$; i.e., at $p = p_v^{Full}$. It is immediate to verify that the second order condition is also satisfied at this price. Now,

substituting $p = p_v^{Full}$ into the expression for $\hat{\gamma}(p)$ yields $\hat{\gamma}(p_v^{Full}) = \frac{1}{2\alpha} \left(\sqrt{1 + \frac{4\alpha(\theta^2 + 2\theta)}{(1+\theta)^2}} - 1 \right)$.

The expression $\hat{\gamma}(p_v^{Full}) \leq \theta$ is therefore equivalent to $2\alpha\theta + 1 \geq \sqrt{1 + \frac{4\alpha(\theta^2 + 2\theta)}{(1+\theta)^2}}$. Squaring

both sides and simplifying, we obtain $4\alpha\theta(\alpha\theta + 1) \geq \frac{4\alpha\theta(\theta+2)}{(1+\theta)^2}$, or $1 + \alpha\theta \geq \frac{\theta+2}{(1+\theta)^2}$. Now, the

LHS of the last inequality is strictly greater than 1, and the RHS is strictly less than 1, so the inequality is always satisfied. Therefore, $\hat{\gamma}(p)$ is maximized at $p = p_v^{Full}$, and the maximal value $\hat{\gamma}(p_v^{Full})$ is strictly less than θ .

Recall that the utility of the virtuous firm when consumers know that it is type v is

$$U_v(\gamma, p) = p(a(1+\theta) - bp) \times (1 - \gamma - \alpha(\theta - \gamma)^2) = R_v(p) \times (1 - \gamma - \alpha(\theta - \gamma)^2).$$

Consider any pair of donation proportion and price $(\bar{\gamma}(p), p)$ such that $p \neq p_v^{Full}$. It follows that

$R_v(p) < R_v(p_v^{Full})$ and $\bar{\gamma}(p) < \hat{\gamma}(p_v^{Full}) < \theta$. So, compared to the price p_v^{Full} , at price p the

virtuous-type firm has a lower revenue, and is further away from its ideal donation proportion. It

follows immediately that its utility is strictly lower at the price p than at the price p_v^{Full} .

Therefore, the donation proportion and price level $(\bar{\gamma}(p_v^{Full}), p_v^{Full})$ maximize the virtuous firm's utility over all donation and price levels $(\bar{\gamma}(p), p)$. As the utility at any (γ, p) where $\gamma > \bar{\gamma}(p)$ is strictly lower than the utility at $(\bar{\gamma}(p), p)$, it follows that over all donation proportions and price levels (γ, p) such that $\mu(\gamma, p) = 1$, the virtuous-type firm attains maximal utility at $(\bar{\gamma}(p_v^{Full}), p_v^{Full})$.

Step 2.2: The virtuous-type firm obtains a higher utility at $(\bar{\gamma}(p_v^{Full}), p_v^{Full})$ than at any (γ, p) such that uninformed consumers believe the firm is the strategic-type.

Consider a deviation to some (γ, p) such that $\mu(\gamma, p) = 0$; i.e., consumers believe the firm is the strategic-type. Over all such (γ, p) , the maximal revenue is attained at p_s^{Full} , and the maximized revenue at this price is $R_s^{Full} = \frac{a^2}{4b}$. Further, the optimal donation amount for the virtuous firm, given revenue R_s^{Full} is $\theta - \frac{1}{2\alpha}$. The resulting utility for the virtuous firm is equal to $(1 - \theta + \frac{1}{4\alpha})R_s^{Full}$.

The utility of the virtuous-type firm at any other (γ, p) such that $\mu(\gamma, p) = 0$ is strictly lower than at $(\theta - \frac{1}{2\alpha}, p_s^{Full})$. Therefore, the virtuous-type firm does not want to deviate from

$(\bar{\gamma}(p_v^{Full}), p_v^{Full})$ as long as $U_v^V \geq (1 - \theta + \frac{1}{4\alpha})R_s^{Full}$. Now, there are two possibilities:

(a) $\bar{\gamma}(p_v^{Full}) = \theta - \frac{1}{2\alpha}$. Then, the condition $U_v^V \geq (1 - \theta + \frac{1}{4\alpha})R_s^{Full}$ reduces to $R_v^{Full} \geq R_s^{Full}$,

which is immediately satisfied, as $R_v^{Full} = (1 + \theta)^2 R_s^{Full} > R_s^{Full}$. In other words, the virtuous-type firm is choosing its full-information levels for donation percentage and price. Therefore, it earns its full-information utility, and no other combination of (γ, p) can yield more utility.

(b) $\bar{\gamma}(p_v^{Full}) = \hat{\gamma}(p_v^{Full})$. Then, note that $\hat{\gamma}(p_v) = \frac{1}{2\alpha} \sqrt{1 + 4\alpha(1 - \frac{R_s^{Full}}{R_v})} - \frac{1}{2\alpha}$, which is a

function only of R_v . For a price level p , we can therefore write $U_v(p) = \beta(R_v)R_v$, where $\beta(R_v) =$

$1 - \hat{\gamma}(p) - \alpha(\theta - \hat{\gamma}(p))^2$ and R_v is in turn a function of p . Define $x = \sqrt{1 + 4\alpha(1 - \frac{R_s^{Full}}{R_v})}$.

Then, $\hat{\gamma} = \frac{x-1}{2\alpha}$. Therefore,

$$\begin{aligned} \beta(R_v) &= 1 - \frac{x-1}{2\alpha} - \alpha \left(\theta^2 + \frac{(x-1)^2}{4\alpha^2} - \frac{\theta(x-1)}{\alpha} \right) = 1 - \alpha\theta^2 + \theta(x-1) - \frac{1}{4\alpha}(x^2 - 1) = \\ &= \frac{R_s^{Full}}{R_v} - \alpha\theta^2 + \theta(x-1) = \frac{R_s^{Full}}{R_v} + \alpha\theta(2\hat{\gamma}(R_v) - \theta) \end{aligned} \quad (6)$$

Therefore, we can write

$$U_v(p) = R_s^{Full} + \alpha\theta(2\hat{\gamma}(R_v) - \theta)R_v \quad (7)$$

So, in equilibrium we have:

$$U_v^V = R_s^{Full} + \alpha\theta(2\hat{\gamma}(R_v^{Full}) - \theta)R_v^{Full}. \quad (8)$$

Therefore, the condition $U_v^V \geq \left(1 - \theta + \frac{1}{4\alpha}\right)R_s^{Full}$ is equivalent to

$$\alpha\theta(2\hat{\gamma}(R_v^{Full}) - \theta)R_v^{Full} \geq \left(\frac{1}{4\alpha} - \theta\right)R_s^{Full}. \quad (9)$$

Recall that one of our assumptions is that $\theta \geq \frac{1}{2\alpha}$. Therefore, $\frac{1}{4\alpha} - \theta < 0$, and the RHS of the previous inequality is strictly negative. The inequality is therefore satisfied whenever the LHS is weakly positive. As $R_v^{Full} > 0$, the LHS is positive whenever $\hat{\gamma}(R_v^{Full}) \geq \frac{\theta}{2}$.

Now, $2\hat{\gamma}(p^{Full}) = \frac{1}{\alpha} \left(\sqrt{1 + 4\alpha \frac{\theta(2+\theta)}{\theta(2+\theta)+1}} - 1 \right)$. Therefore, the condition $2\hat{\gamma}(R_v^{Full}) \geq \theta$ can

also be written as: $\sqrt{1 + 4\alpha \frac{\theta(2+\theta)}{\theta(2+\theta)+1}} \geq 1 + \alpha\theta$, or $\alpha \leq \frac{2(3-\theta^2)}{\theta(1+\theta)^2}$

$$\alpha\theta \leq \frac{2(3-\theta^2)}{(1+\theta)^2} \quad (10)$$

Note that $\alpha > \frac{1}{2\theta}$ implies that $\alpha\theta > \frac{1}{2}$. The RHS of inequality (10) is easily verified to be weakly greater than 1 for all $\theta \in (0, 1)$. Therefore, there exists a range of parameters such that

$\frac{1}{2} < \alpha\theta \leq \frac{2(3-\theta^2)}{(1+\theta)^2}$. For any parameters in this range, the virtuous-type firm does not want to

deviate to any (γ, p) pair such that uninformed consumers believe the firm is the strategic-type.

(Note that this condition is assumed in Assumption 1, part (ii).)

Step 2.3. The virtuous-type firm obtains a higher utility at $(\bar{\gamma}(p_v^{Full}), p_v^{Full})$ than at any (γ, p) such that uninformed consumers believe the firm is the virtuous-type.

Consider any $(\gamma, p) \neq (\bar{\gamma}(p_v^{Full}), p_v^{Full})$ such that $\gamma > \bar{\gamma}(p)$. If the virtuous-type firm deviates in such a manner, uninformed consumers believe it is the virtuous-type firm. Therefore, the utility of the virtuous-type firm following the deviation is

$$\tilde{U}_v = (1 - \gamma - \alpha(\theta - \gamma)^2)p(a(1 + \theta) - bp). \quad (11)$$

Now, as $\bar{\gamma}(p) \geq \theta - \frac{1}{2\alpha}$ for any (γ, p) such that $\gamma \geq \bar{\gamma}(p)$, we have $1 - \gamma - \alpha(\theta - \gamma)^2 < 1 - \bar{\gamma}(p) - \alpha(\theta - \bar{\gamma}(p))^2$. Therefore, $\tilde{U}_v < (1 - \bar{\gamma}(p) - \alpha(\theta - \bar{\gamma}(p))^2)p(a(1 + \theta) - bp)$.

Hence, the virtuous-type firm obtains a higher utility at $(\bar{\gamma}(p_v^{Full}), p_v^{Full})$ than at any other (γ, p) such that uninformed consumers believe the firm is the virtuous-type.

Step 3. The equilibrium exhibited survives the Intuitive Criterion.

Consider any off-equilibrium pair (γ, p) . Suppose first that $\gamma \leq \bar{\gamma}(p)$. By definition of $\bar{\gamma}(p)$, at any such pair (γ, p) , if uninformed consumers believe the firm is virtuous-type, the strategic-type firm earns a weakly higher profit than in equilibrium. Therefore, in the first step of the Intuitive Criterion, the set of firm types that will not deviate to (γ, p) excludes the strategic-type firm. Hence, the belief that $\mu(\gamma, p) = 0$ survives the second step of the Intuitive Criterion.

Next, suppose that $\gamma > \bar{\gamma}(p)$. Again by definition of $\bar{\gamma}(p)$, at any such pair (γ, p) , the strategic-type firm earns a strictly lower profit than in equilibrium. Hence, the set of firms that will never deviate to (γ, p) includes the strategic-type firm, so that the belief that $\mu(\gamma, p) = 1$ survives the second step of the Intuitive Criterion.

Finally, we show that no other separating equilibrium survives the Intuitive Criterion.

Consider any other separating equilibrium, $(\tilde{\gamma}, \tilde{p})$. It must be that either $\tilde{p} \neq p_v^{Full}$ or $\tilde{\gamma} > \bar{\gamma}(p)$.

In either case, the equilibrium profit of the virtuous-type firm is strictly lower than the profit in the separating equilibrium in which it charges p_v^{Full} and sets a donation percentage $\bar{\gamma}(p_v^{Full})$. Now, consider a deviation by the virtuous-type firm to a pair $(\gamma, p) = (\bar{\gamma}(p_v^{Full}) + \varepsilon, p_v^{Full})$. As the strategic-type firm will never deviate to this pair (γ, p) , to satisfy the Intuitive Criterion, it must be that $\mu(\gamma, p) = 1$. That is, following the deviation, uninformed consumers must believe that the firm is the virtuous-type. But then the deviation is profitable for the virtuous-type firm, breaking the conjectured equilibrium. Hence, the equilibrium exhibited in the proposition is unique among all separating equilibria. ■

2. Comparison of Firm Utility and Consumer Surplus across the Three Scenarios

In equilibrium, the pricing and donation decisions of the strategic firm are the same across all three scenarios. Therefore, focus on the virtuous firm only.

Full-information case:

$$\text{Firm utility is: } U_v^{Full} = \left(1 - \theta + \frac{1}{2\alpha} - \alpha \left(\frac{1}{2\alpha}\right)^2\right) \times \frac{a^2}{4b} (1 + \theta)^2 = \left(1 - \theta + \frac{1}{4\alpha}\right) \frac{a^2}{4b} (1 + \theta)^2.$$

$$\text{Consumer surplus is } CS_v^{Full} = \frac{1}{2} \times \frac{a}{2} (1 + \theta) \times \frac{a}{2b} (1 + \theta) = \frac{a^2}{8b} (1 + \theta)^2.$$

Lenient regime (non-verifiable case):

Following Proposition 1, when firm donations are not verifiable, $p_v^N = \frac{a}{2b} \left(1 + \theta + \sqrt{\theta^2 + 2\theta}\right)$;

$$q_v^N = \frac{a}{2} \left(1 + \theta - \sqrt{\theta^2 + 2\theta}\right); \gamma_v^N = \theta - \frac{1}{2\alpha}; U_v^{NV} = \left(1 - \theta + \frac{1}{4\alpha}\right) \frac{a^2}{4b}.$$

Intuitively, consumer surplus must be lower than in full-information case, because the virtuous firm distorts its product price to be higher than optimal and its demand also drops as a result.

$$CS_v^N = \frac{1}{2} \times \frac{a}{2} \left(1 + \theta - \sqrt{\theta^2 + 2\theta}\right) \times \left[\frac{a}{b} - \frac{a}{2b} \left(1 + \theta + \sqrt{\theta^2 + 2\theta}\right) \right] = \frac{a^2}{8b} \left(1 + 2\theta - 2\sqrt{\theta^2 + 2\theta}\right) \quad (12)$$

Apparently, $CS_v^N = \frac{a^2}{8b} \left(1 + 2\theta - 2\sqrt{\theta^2 + 2\theta}\right)$ is less than the consumer surplus obtained in full-

information scenario $CS_v^{Full} = \frac{a^2}{8b} (1 + \theta)^2 = \frac{a^2}{8b} (1 + 2\theta + \theta^2)$.

Strict regime (verifiable case):

Following Proposition 2, when donations are verifiable, the optimal price of the virtuous firm is the same as in full-information case. Thus, the demand side, including consumer surplus, is

unaffected: $p_v^V = p_v^{Full} = \frac{a}{2b} (1 + \theta)$; $q_v^V = q_v^{Full} = \frac{a}{2} (1 + \theta)$; $CS_v^V = CS_v^{Full} = \frac{a^2}{8b} (1 + \theta)^2$. Yet, the

virtuous firm may distort its donation level in order to separate from the strategic firm:

$$\bar{\gamma}(p_v^V) = \max \left(\theta - \frac{1}{2\alpha}, \frac{1}{2\alpha} \left(\sqrt{1 + 4\alpha \frac{R_v^V - R_s^V}{R_v^V}} - 1 \right) \right) = \max \left(\theta - \frac{1}{2\alpha}, \frac{1}{2\alpha} \left(\sqrt{1 + \frac{4\alpha\theta(2+\theta)}{1+\theta(2+\theta)}} - 1 \right) \right).$$

And firm utility is $U_v^V = \left[\left(1 - \bar{\gamma}(p_v^V)\right) - \alpha \left(\theta - \bar{\gamma}(p_v^V)\right)^2 \right] \cdot \frac{a^2(1+\theta)^2}{4b}$.

(i). If $\bar{\gamma}(p_v^V) = \theta - \frac{1}{2\alpha}$, then apparently the virtuous firm does not have to distort its donation

level. Its utility is the same as in the full-information case $U_v^V = U_v^{Full} = \left(1 - \theta + \frac{1}{4\alpha}\right) \frac{a^2}{4b} (1 + \theta)^2$,

which is greater than its utility in the non-verifiable case $U_v^N = \left(1 - \theta + \frac{1}{4\alpha}\right) \frac{a^2}{4b}$.

(ii). If $\bar{\gamma}(p_v^V) = \frac{1}{2\alpha} \left(\sqrt{1 + \frac{4\alpha\theta(2+\theta)}{1+\theta(2+\theta)}} - 1 \right)$, denote $x = \sqrt{1 + \frac{4\alpha\theta(2+\theta)}{1+\theta(2+\theta)}}$. Then,

$\bar{\gamma}(p_v^V) = \frac{1}{2\alpha} (x - 1)$. The utility of the virtuous firm is:

$$U_v^V = \left[\left(1 - \frac{x-1}{2\alpha} \right) - \alpha \left(\theta - \frac{x-1}{2\alpha} \right)^2 \right] \times \frac{a^2(1+\theta)^2}{4b} \quad (13)$$

$$= \left(1 - \frac{x-1}{2\alpha} - \alpha\theta^2 + \theta(x-1) - \frac{(x-1)^2}{4\alpha} \right) \times \frac{a^2(1+\theta)^2}{4b} . \quad (14)$$

The utility under the lenient regime is $U_v^N = \left(1 - \theta + \frac{1}{4\alpha} \right) \times \frac{a^2}{4b}$.

Therefore, $U_v^V \geq U_v^N$ is equivalent to:

$$\left[1 - \frac{x-1}{2\alpha} - \alpha\theta^2 + \theta(x-1) - \frac{(x-1)^2}{4\alpha} \right] (1+\theta)^2 \geq 1 - \theta + \frac{1}{4\alpha} \quad (15)$$

$$\left(\alpha - \frac{x}{2} + \frac{1}{2} - \alpha^2\theta^2 + \alpha\theta x - \alpha\theta - \frac{x^2}{4} + \frac{x}{2} - \frac{1}{4} \right) (1+\theta)^2 \geq \alpha - \alpha\theta + \frac{1}{4} \quad (16)$$

$$\left(\alpha - \alpha^2\theta^2 + \alpha\theta x - \alpha\theta - \frac{x^2}{4} + \frac{1}{4} \right) (1+\theta)^2 \geq \alpha - \alpha\theta + \frac{1}{4} \quad (17)$$

The last inequality is a polynomial in α and θ . We evaluate it numerically by considering values of θ between 0 and 1, and all α values that satisfy Assumption 1, part (ii); i.e., values between $\frac{1}{2\theta}$ and $\frac{2(3-\theta^2)}{\theta(1+\theta)^2}$. We find that the inequality holds for all such pairs of α and θ .

Therefore, the virtuous firm has a higher utility in the strict regime, compared to the lenient regime.