

Bidder Motives in Cause Related Auctions

Ernan Haruvy

and

Peter T. L. Popkowski Leszczyc

February 2009

Associate Professor of Marketing, The University of Texas at Dallas, School of Management, SM 32, 2601 North Floyd Road, Richardson, TX 75083-0688. Phone: 972-883-4865; Fax: 972-883-6727; Email: eeh017200@utdallas.edu

Associate Professor of Marketing, University of Alberta, 4-20F School of Business, University of Alberta, Edmonton. AB, Canada T6G 2R6. Phone: (780) 492-1866, Fax: (780) 492-3325; E-mail: ppopkows@ualberta.ca

This research was supported by grants from the Social Sciences and Humanities Research Council of Canada, through both its Initiative on the New Economy Research Alliances Program (SSHRC grant 538-02-1013) and its Standard Research Grants Program (SSHRC grant 410-01-1332).

Bidder Motives in Cause Related Auctions

Abstract. A cause-related auction is different from a list price setting in two major ways: First, the donation percentage directly affects the price of the item in that consumers' value for charitable contributions enters their bids. Second, charitable consumers have a price externality on non-charitable consumers, so even a segment of consumers who place a premium on charitable contributions can significantly affect prices for everybody else. The purpose of this paper is to characterize both the charity premium and the impact of the charitable segments with a careful field design. We examine individual choice between pairs of simultaneous auctions identical in all but percentage of the proceeds donated to charity. We investigate the extent to which individuals are willing to pay a charity premium in choice between auctions of various donation percentages. We use a mixture model approach to allow for different types of individual preferences. In analysis of choices between pairs of auctions, we find that individuals fall into three segments—bargain seekers and two altruistic segments. The altruistic segments, which drive up the charity premium, can in turn be classified into warm glow bidders—who derive a pleasure from doing the right thing—and other-regarding bidders—who are sensitive to the percentage given to charity. Further analysis shows that warm glow bidders positively contribute to the charity premium in pairs of auctions that do not differ much in donation percentages, whereas the other-regarding bidders drive up the premium in pairs of auctions that differ much in donation percentages. This means that managers should focus their marketing efforts on appealing to these different segments, depending on the percentage donated to charity relative to some near substitute. Correctly identifying the charitable segments and their impact is of utmost importance in cause related marketing, and we discuss managerial implications of bidder charitable motives in auctions.

1. Introduction

The past decade has experienced a significant increase in charitable giving. Internet charity auctions in particular are on the rise, with eBay dedicating a special section for charity auctions. Not only do these auctions play an important role for non-profit organizations, but an increasing number of firms are sponsoring these events to establish themselves as good corporate citizens. In turn, sponsorship of these social causes may improve a firm's image or profits (Lichtenstein et al. 2004; Navarro 1988; Varadarajan and Menon 1988).¹

While charitable auctions are an important fundraising tool, little is known about their effectiveness or about the bidding behavior and the charitable intent of the participants in these auctions. Theoretical works (e.g., Engers and McManus, 2007; Ettinger, 2003; Goeree et al., 2005) have investigated the theoretical properties of different formats of charity auctions under the assumption that bidders care about the charity's revenue. The general result from these studies is that private benefits from charitable giving can translate into a "charity premium"-- an increase in auction revenue resulting from charitable donations.

Unlike non-charity auctions, where careful analysis of bids can reveal preference for the item being auctioned off, in charity auctions, the decision to bid also relates to one's altruistic preference for donation. For identification of this altruistic component, separate from one's valuation of the item, endogenous choice between auctions with different donation percentages is the focus here². As such we have a novel way to measure bidders' charitable intent.

¹ There is a growing body of research in marketing that has concluded that linking product purchases with donations to charities has a positive impact on perceptions (e.g., Brown and Dacin, 1997) and brand choice (e.g., Lichtenstein et al., 2004; Pracejus, Olsen and Brown, 2003; Strahilevitz and Meyers, 1998;) However, these positive effects are not universal, since several researchers have shown that in certain instances it may lead to a reduction in purchase intention (Luo and Bhattacharya, 2006; Sen and Bhattacharya, 2001; Handelman and Arnold, 1999).

² Endogenous choice between auctions is critical and may reverse known theoretical results. Empirically, Carpenter, Holmes and Matthews (2008) found that in four sealed bid charity auctions it appears that a reversal of the theoretical predictions may be due to endogenous bidder participation.

With the exception of empirical works by Ku et al. (2005) on competitive arousal and Isaac and Schnier (2005) on jump bidding, extant empirical research on charity auctions has focused on identifying the optimal auction format (Carpenter, Holmes and Matthews, 2008; Salmon and Isaac, 2006). In contrast to past literature, we study the case where bidders are faced with a choice between identical simultaneous product auctions with different percentages donated to charity.

One key issue relates to individual selfish optimization in charity auction settings. This is a basic underlying assumption in analysis of non-charity auctions and it is interesting to see whether it holds in charity auctions. It is plausible that not all individuals will behave in a manner consistent with seeking the best deal when faced with the decision to bid in a charity or non-charity auction for the same good (Engers and McManus, 2007; Ettinger, 2003; Salmon and Isaac, 2006). One reason bidders might not be fully sensitive to price is due to charitable considerations. That is they may have a genuine concern for the well-being of others. This type of motive is often referred to as pure altruism (Becker 1974). According to the model of pure altruism, an individual derives utility from the well being of others, regardless of the source of funding. This model may explain charitable giving but may also predict a substantial crowding out of an individual's own donations due to additional contributions by others (Roberts 1984). However, individuals may also donate for other reasons (Fisher, Vandenbosch and Antia 2008) such as utility from the act of giving itself. This is known as warm glow (Andreoni, 1989; Konow, 2004, Eckel et al., 2005). This warm glow may arise because individuals think they are observed by others (Glazer and Konrad, 1996; Romano and Yildirim, 2001) or as a signal of social status (Rose-Ackerman, 1996; Glazer and Konrad, 1996).

In field data, where valuations cannot be observed, alternative utility specifications are typically at best very difficult to extract. In the present setting, however, we can make some inferences about individual preferences based on choices among competing auctions. We identify different segments of bidders, based on their bidding behavior in charity and non-charity auctions. We find charitable

segments, corresponding to both warm glow and other-regarding altruism, willing to pay a significant price premium for auctions involving charitable donations, as well as non-charitable segment.

2. Data description

All experiments were conducted on a local internet auction website, hosted in a major North American city. The auction website uses a similar format as eBay.com. The auction website was established in September 2002 and had over 6,300 registered users as of October 2007. The website conducts both charity and non-charity auctions and registered users are familiar with this website as a regular auction site, not just a charity auction site.³ The participants used in this dataset were given a simple demographics questionnaire, with 133 responses. Based on this questionnaire, we can say that approximately 60% of our bidders are male, 68% are over the age of 35, 70% are married or have been married, and 66% earn more \$60,000 annually. More detailed demographics are given in appendix A.

The researchers had complete control over both the layout of the website and the content of the items on the website for the duration of the study. The main auction page featured all items. In addition, the use of the local website allows us to control for confounding variables, including reserve prices, auction description, different auctioneers, and competition. In particular, there were no competing auctions for similar items by other sellers for the duration of the study. Bidders were notified by e-mail about upcoming auctions. In addition, auction events were advertised in local newspapers and through posters in strategic locations.

All products were sold to the highest bidder, using proxy bidding in ascending price auctions (as in eBay). Each auction included a detailed product description, a picture, and a starting bid of \$0.01. The product description did not provide price information of the product. Products were sold through an established seller with over 200 feedback ratings. Auctions had a fixed end time and one-

³ This is important for the analysis, since it addresses the issue of selection. When users come to a charity website, they are likely interested in donating to charity. Here the users are potentially looking for a good deal.

day duration. Pairs of identical items were listed simultaneously next to each other and closed sequentially within 30 seconds of each other.⁴ The order of the items was randomly determined. Data were collected on the complete bidding history of all auctions, including proxies by all bidders. At the completion of the auction the winning bidders collected and paid for the items at a local retail outlet.

The data set consists of four batches, summarized in Appendix A by batch. The batches differed on the type and nature of the items as well as the donation percentages for the two items in a pair. Each batch consists of pairs of auctions starting and ending at roughly the same time (a 30 seconds difference – the difference is only in the ending time). The products range from collectible stamps, computer products, cosmetics, electronics, gift certificates, and tools, among others. The batches have 276, 96, 124, and 176 usable individual auctions for batches 1-4 respectively. The auctions are arranged in pairs. Donation percentages are either zero, partial (positive <100%) or full (100%). A charity auction with 100% donation is always paired with a non-charity auction with 0% donation. We refer to such pairs of auctions as full donation pairs and to all other pairs of auctions as partial donation pairs. There were 162 auction pairs in the partial donation set and 174 pairs in the full donation set. A total of 319 bidders participated in our data set. The average number of auction pairs an individual made bids in was 5.38. Basic information on each batch is given in appendix A. In the table below, we classify the items sold into 10 major categories to see if there are any major differences in bidding patterns between different categories. We see that in all categories the average number of bidders is 3 to 5, with a standard deviation of 1 to 2. The category that stands out on charity premium is hand crafted items, even though it is solidly in the middle on donation percentages. In addition, entertainment and fashion accessories have a relatively higher donation premium. These results are

⁴ At the bottom of each auction, just above the bid box, there was a clear message indicating the percentage, if any, donated to charity (e.g. 100% of the proceeds of this auction are donated to charity). If an auction is not a charity auction, the message would read “This is not a charity auction, no proceeds of this auction are donated to charity.” In all other respects were the paired auctions completely identical.

consistent with the finding by Strahilevitz and Myers (1998), who found that charitable contributions are more effective for promoting frivolous products.

Overall the summary statistics seem to suggest significant charitable motives, which will be confirmed shortly in a formal regression.

Table 1. Summary statistics

| Category | # bidders | # Bids | Final Bid | Premium | %Premium | Retail Price | % Donation Diff | # auction pairs |
|------------------|--------------|---------|--------------|---------|----------|-----------------|-----------------------|-----------------------|
| | 3.42 | 19.11 | 18.40 | 3.15 | 13.32 | 28.14 | 85.53 | |
| Computer | (1.48) | (23.65) | (15.85) | (6.73) | (33.60) | (24.15) | (30.35) | 45 |
| | 4.81 | 27.29 | 33.59 | 4.65 | 10.81 | 37.28 | 61.92 | |
| Electronics | (1.90) | (25.48) | (27.36) | (8.47) | (20.59) | (32.44) | (42.97) | 59 |
| | 3.39 | 17.75 | 11.83 | 2.77 | 24.49 | 20.77 | 58.39 | |
| Entertainment | (0.99) | (15.54) | (6.83) | (5.09) | (38.97) | (8.16) | (43.50) | 61 |
| | 3.86 | 37 | 23.64 | 4.97 | 25.92 | 29.34 | 84.97 | |
| Fashion | (1.43) | (25.34) | (13.68) | (11.76) | (41.58) | (14.39) | (30.46) | 29 |
| | 4.50 | 24.89 | 24.28 | 0.33 | 5.24 | 33.67 | 53.33 | |
| Gift certificate | (1.76) | (18.05) | (12.57) | (2.88) | (14.20) | (29.15) | (43.11) | 18 |
| | 3.00 | 17.93 | 10.83 | 4.86 | 44.62 | 16.81 | 68.44 | |
| Handcrafts | (1.00) | (15.15) | (9.42) | (7.83) | (47.18) | (3.41) | (37.66) | 27 |
| | 4.71 | 10.90 | 14.30 | 1.83 | 14.50 | 20.87 | 19.48 | |
| Health & beauty | (1.68) | (5.86) | (10.75) | (3.50) | (23.48) | (19.31) | (21.02) | 21 |
| | 4.52 | 18.56 | 16.09 | 2.08 | 16.77 | 18.95 | 35.11 | |
| House ware | (1.28) | (19.01) | (7.32) | (4.72) | (35.16) | (15.68) | (37.01) | 27 |
| | 4.901 | 17.18 | 22.17 | 2.32 | 6.47 | 29.56 | 28.55 | |
| Sports/Outdoors | (1.44) | (15.46) | (17.96) | (6.29) | (17.00) | (24.94) | (25.80) | 22 |
| | 3.48 | 30.04 | 24.48 | 4.76 | 16.10 | 25.93 | 82.33 | |
| Stamps | (1.19) | (15.26) | (12.44) | (12.20) | (44.80) | (8.88) | (31.01) | 27 |

Proceeds of the charity auctions are donated to four significant charities – the United Way, the local Christmas Bureau, the Sign for Hope, and the Stollery Children’s Hospital foundation. All non-charity proceeds go to the auction website. Participants are not told who the beneficiaries of the regular auction proceeds are. To the extent that bidders may be altruistic towards the auctioneer (the organizer of the charity event) this makes our results more conservative.

3. Theory

3.1. Charity Premium

The fact that people can behave in a seemingly non-selfish manner is well known. People (as well as animals) have been observed doing kind acts, giving to others, and helping others in need (see Fehr and Fischbacher, 2003, for overview). The ability of a marketing manager to harness that altruism is less certain. In a market setting, people are predisposed to seek bargains (e.g., see Vohs et al. 2006 for the difference between market and social settings). Moreover, individuals may be inclined to free-ride on others' altruism. Thus, a cause related campaign by a company may create goodwill but may not significantly affect consumers' willingness to pay for a given product. Accordingly, the first question we ask is whether a charity premium can be observed in cause-related auctions. The pairwise design described in this paper is ideal for answering this question.

3.2. Preferences and Segments

Following a determination of whether a charity premium is present, one must characterize its drivers. The emerging opinion in the literature is that social (non-selfish) preferences are the main driver of a charity premium. We begin our analysis of social preferences by specifying a utility function for auction participants that includes social components. The proposed utility function is similar to the utility structure proposed in the literature (Engers and McManus, 2007; Ettinger, 2003; Goeree et al., 2005; Salmon and Isaac, 2006), but adapted for choices between pairs of auctions. In choosing between two auctions for an identical item, participants are assumed to consider and compare the prices in the two auctions (the selfish component of the utility), warm glow aspects from choosing the higher donation charity, and the portions given to charity in both auctions (the other-regarding component). The result is person j 's incremental deterministic utility of the higher percentage charity auction in pair i :

$$\Delta U_{ij} = \alpha_j + \beta_j [\text{percent}_{\text{high_charity}} - \text{percent}_{\text{low_charity}}] + \gamma_j [\text{price}_{\text{high_charity}} - \text{price}_{\text{low_charity}}] \quad (1)$$

The subscript j denotes the individual. The subscript i denotes the auction. U denotes utility. The variable percent denotes the percentage of the revenue that goes to the charity. This is the variable being manipulated in the present experimental design. Parameter α_j — consumer j 's intercept-- denotes the utility for the auction with the higher donation percentage (utility of donating 100% in the full donation pairs). We therefore call this parameter the warm glow. Parameter β_j represents consumer j 's value for the proceeds going to charity⁵. This is different from the warm glow, which is a utility for giving, regardless of the amount that goes to charity. Parameter γ_j measures j^{th} sensitivity to a price premium for the high donation charity (note that this is a dollar premium—not in percentage terms). Thus, the distribution of the ratios α_j / γ_j and β_j / γ_j in the population of bidders is of utmost interest.

An auction is different from other settings in that even a segment of consumers who place a premium on charitable contributions can significantly affect prices for everybody else. One purpose of this paper is to identify and characterize this charitable segment with a careful field design and measure its impact. The experimental design here is a pairwise design. This means that there are two identical items being auctioned simultaneously. We gather the individual's preferences from his choices. This choice is assumed to follow a logistic distribution. The choice probability of the higher percentage donation auction in the pair is then captured by the logistic mapping:

$$\Pr(\text{Choose high charity auction}) = \frac{1}{1 + \exp(U_{\text{low_charity}} - U_{\text{high_charity}})} \quad (2)$$

The choice probability of the lower donation auction in the pair is 1 minus the probability above.

However, consumers differ in their degrees of charitable intent. Therefore, we next consider heterogeneity in consumers' charitable preferences.

⁵ Since ΔU denotes the utility difference between the two auctions in a pair, β_j is multiplied by the percentage difference. However, if one were to separate the utility difference into its components, U_1 and U_2 , β_j would be the coefficient on percentage donation in each utility. It is therefore referred to as utility for donation and not utility for donation difference.

Mixture Model. Consumers are heterogeneous. Clearly, the most realistic depiction of heterogeneity entails segments of one—each consumer has a different set of preferences from every other consumer. Unfortunately, with only a few observations per consumer, it is not feasible to estimate a separate set of parameters for each individual. A continuous distribution (known as random coefficients) is feasible, but less realistic and less informative, and cannot give us meaningful statistical information about the ratios of the parameters to one another (it is a known shortcoming of such models). A more informative, albeit simplifying modeling choice is that of mixture models. In this choice, we allow the consumer population to fall into segments. We do not place restrictions *ex ante* on the number of segments or the parameters of each segment. We let the data tell us how many segments are statistically meaningful to have and what their corresponding parameters are. The basic procedure is to compute the likelihood for each consumer conditional on belonging to a particular segment. The unconditional likelihood for that consumer is the weighted sum of the conditional likelihoods, weighted by the estimated proportion of each of the segments. Finally, the total likelihood is the product of the individual likelihoods.

$$L(\text{individual } j) = \sum_{s=1}^{\text{Number of Segments}} L(\text{individual } j \mid \text{Segment } s) \Pr(\text{Segment } s) \quad (3)$$

As explained above, we do not *ex-ante* place restrictions on the number of segments or constraints on their parameters, but we can nevertheless revisit behavioral explanations proposed in the literature and hypothesize that some of the types will correspond to some of these explanations.

In section 3.1 we mentioned three distinct behavioral models that can be nested in equation (1). The selfish model has $\alpha = \beta = 0$ and $\gamma > 0$. Warm glow behaviour is captured by $\alpha > 0$ and $\beta = 0$. Other regarding behaviour is captured by $\alpha = 0$ and $\beta > 0$.

4. Results

4.1. Charity premium

We begin by characterizing the charity premium and its factors. We define charity premium as the difference in auction revenue between the higher percentage charity auction and the lower percentage (non-charity auctions are denoted as 0%) charity auction. Since different auctions involve different items, it may be more informative to look at charity premiums as percentages.

$$\text{Dollar charity premium}_i = \text{revenue}_{\text{high_charity}_i} - \text{revenue}_{\text{low_charity}_i} \quad (4)$$

$$\text{Percent charity premium}_i = (\text{revenue}_{\text{high_charity}_i} - \text{revenue}_{\text{low_charity}_i}) / (\text{revenue}_{\text{high_charity}_i} + \text{revenue}_{\text{low_charity}_i}) * 2 * 100\% \quad (5)$$

where i denotes the i -th auction pair in the study. As noted in the introduction, even the sign, let alone the magnitude, of this charity premium is an empirical question. We begin by reporting summary statistics on the charity premium. Standard deviations are reported in parentheses. Recall from the data description that a charity auction with 100% donation is always paired with a non-charity auction with 0% donation. We classify such auctions, 174 out of 336 pairs, as a subset of interest. We refer to these 174 pairs of auctions as full donation pairs and to all other 162 pairs of auctions as partial donation pairs.

Table 2. Charity premium: Average dollar and percentage premium, std. deviation in parentheses.

| Data Set | Dollar Premium | Percentage Premium |
|--|----------------|--------------------|
| Full donation pairs: Auction pairs with 100% vs. 0% donation (N=174) | \$5.4 (\$9.5) | 25.9% (37.0%) |
| Partial donation pairs: Auction pairs with intermediate donation percentages (N=162) | \$1.2 (\$3.8) | 10.59% (31.2%) |
| All auction pairs (N=174+162=336) | \$3.4 (\$7.6) | 18.5% (35.1%) |

Before looking at individual bidding behaviour, it is important to examine what auction factors are correlated with these premiums. The first factor to look at is the difference in donation percentages between the two charities. Other factors may include the number of bidders and the retail price. The number of bidders may be important if the charity premium is driven by frenzy⁶ rather than by more individualistic charitable motives. A high retail price may trigger more bargain hunting than a low retail price as people are more likely to be charitable when charity is less costly. This is consistent with evidence that positive utility gained from giving to others follows a pattern of diminishing returns (Andreoni, 2006). Lastly, the product category is important because some categories may trigger more charitable motives or more bargaining instincts (e.g. Strahilevitz and Myers, 1998, found that charitable contributions are more effective for promoting frivolous products).

We check two specifications for charity premium. The first specification (model 1) regresses charity premium on the factors described above. The second (model 2) adds a dummy for the full pairs (auction pairs with 100% charity vs. 0% charity). This dummy captures potentially nonlinear utility from the donation percentage.

$$\text{Charity Premium} = \text{Constant} + \alpha \text{ Donation percentage difference} + \beta \text{ Number of Bidders Difference} + \gamma \text{ Retail Price} + \delta \text{ Product Category} + \mu \text{ Full Pair Dummy} \quad (6)$$

Table 3. Regression results of variables influencing charity premium
Dependent Variable: Charity premium (percentage)

| Parameter | Model 1 | Model 2 |
|-------------------|-------------------|---------------------|
| Intercept | -4.87 (7.73) | -12.71 (8.51) |
| Donation pct Diff | 0.25*** (0.05) | 0.65*** (0.19) |
| No. Bidders Diff | 0.30 (1.14) | -0.03 (1.14) |
| Retail price | -0.004 (0.09) | 0.01 (0.09) |
| Full pair dummy | ---- | -34.18** (15.95) |

*p<0.10; ** p<0.05; *** p < 0.01

⁶ Frenzy is the notion of competitive arousal in the process of bidding that influences both the value of bids and intensity of bidding (Ku et al., 2005).

Note that the full pair dummy came out significant and negative, indicating diminishing returns to really high percentage differences. An alternative specification with an exponent to capture the same pattern does not improve fit, possibly because the data does not have percentage difference between 50% and 100%-- there is a range lower than 50% difference as well as 100% difference. Hence the dummy captures diminishing returns best.

Only donation percentage difference came out significant of the main factors. In model 2, the coefficient, 0.65, means that each percentage point (1%) in small to moderate donation amounts translates to 0.65% increase in price. That means that a company donating a percentage (less than 100%) of its proceeds to charity only loses 0.35% in revenue for each 1% it donates (factoring one third as a tax deduction, charity as a marketing tool seems pretty inexpensive). Other than the percentage related parameters, none of the other main factors came out significant. Of the category dummies, handcrafted items came out significant with a coefficient of 32.1 and p-value of 0.0004. No other categories came out significant.

4.2. Preferences and Segments

To uncover individual motives, we use the last choice among each pair of auctions by each bidder. Since most bidders participated in more than a single pair of auctions, this gives us a profile on each bidder that allows us to uncover something about motives for that bidder. We let the “prices” that enter the choice model be the minimum feasible bids at the time of the bidder’s last bid.

We employ latent class segmentation (Kamakura and Russell, 1989) to control for unobserved heterogeneity. For identification purposes, we take out bidders who participated in fewer than 4 auctions. We also account separately for bidders who bid in different studies. This leaves us with 111 bidders out of 319 unique bidders and with 731 distinct bids.

We estimate one, two, three and four segment models and use the Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC) to determine the optimal number of segments.

In our estimation, the proportion of each subpopulation is bounded from 0 to 1. To avoid boundary problems, we estimate an unbounded parameter lambda for each of the segments such that the

proportion of segment s is $\frac{\exp(\lambda_s)}{1 + \sum_k \exp(\lambda_k)}$. The three segment model emerges with the best BIC and

AIC in the regression (Table 4).

The results of Table 4 indicate that there are three segments (22%, 35%, and 43%). All three segments appear to be somewhat price sensitive. The warm glow coefficient is positive and significant only for segment 2. The coefficient on donation is positive and significant only for segment 3, which is the largest segment. Segment 1 bidders appear unwilling to pay a price premium.

Table 4. Regression results for 3-segment model
Dependent variable: Choice of the higher percentage charity auction

| | Parameters | Estimates |
|--------------------------------------|-----------------|----------------|
| Segment 1: Bargain Seekers | Warm glow | 0.30 (0.76) |
| | Price | -9.24 (0.12)** |
| | Donation | 1.64 (1.42) |
| Segment 2: Warm Glow | Warm glow | 0.63 (0.32)** |
| | Price | -0.30 (0.07)** |
| | Donation | -0.98 (0.55)* |
| Segment 3: Other-regarding | Warm glow | -0.16 (0.29) |
| | Price | -0.06 (0.02)** |
| | Donation | 0.75 (0.37)** |
| | Proportion Seg1 | 0.22 (0.12)** |
| | Proportion Seg2 | 0.35 (0.71) |
| | Log likelihood | -410 |
| | BIC | 890 |
| | AIC | 839 |
| | AIC 2-segments | 847 |
| | AIC 4-segments | 839 |

* $p < 0.10$

** $p < 0.05$

Note that the first segment here is a purely price sensitive segment, which we name the *bargain seeking segment*. Price is highly significant and the magnitude of the price coefficient is a large

multiple of that of the other segments. The second segment is a *warm glow segment* with negative regard to the percentage donated. This segment can be thought of as seeking the acclaim that goes with donating, but at the lowest possible cost (lower donation percentages, as indicated by the negative coefficient for donation). The third segment appears to be other-regarding segment in that it considers the actual donation percentage difference between the two auctions in a pair. These bidders are willing to pay a premium price in order to bid in an auction where a higher percentage is donated to charity.

Next we perform simulations to conduct ‘what if’ analysis to estimate the effect of different bidding scenarios on the charity premium contribution for each bidder segment.

4.3. Simulations

Simulation methodology. Our inputs for the simulation are the donation percentages, number of bidders, average number of bids per bidder, and average bid increment for the 336 auction pairs. We do not incorporate specific bids, individual bidding statistics or any individual bidder data into the simulations. In other words, bidders are entirely simulated.

We generate 2000 simulated data sets for each of the auction pairs, taking the average number of bidders as given and assuming that all bidders observe both auctions in a pair. We independently draw a type for each bidder in each simulated data set, and the probability of a bidder being classified as each of the three types comes from the estimated proportions of types in Table 4. Bidders observe current price and donation percentages and bid probabilistically in a given period on either auction, according to the probability specified in equation (2), with the utility specification of equation (1).

Bidders bid sequentially. The maximum number of bids allowed per bidder is the empirically observed average number of bids per bidder multiplied by a multiplier necessary to make the simulated number of non-rejected (sufficiently high) bids equal to the empirically observed number of bids.

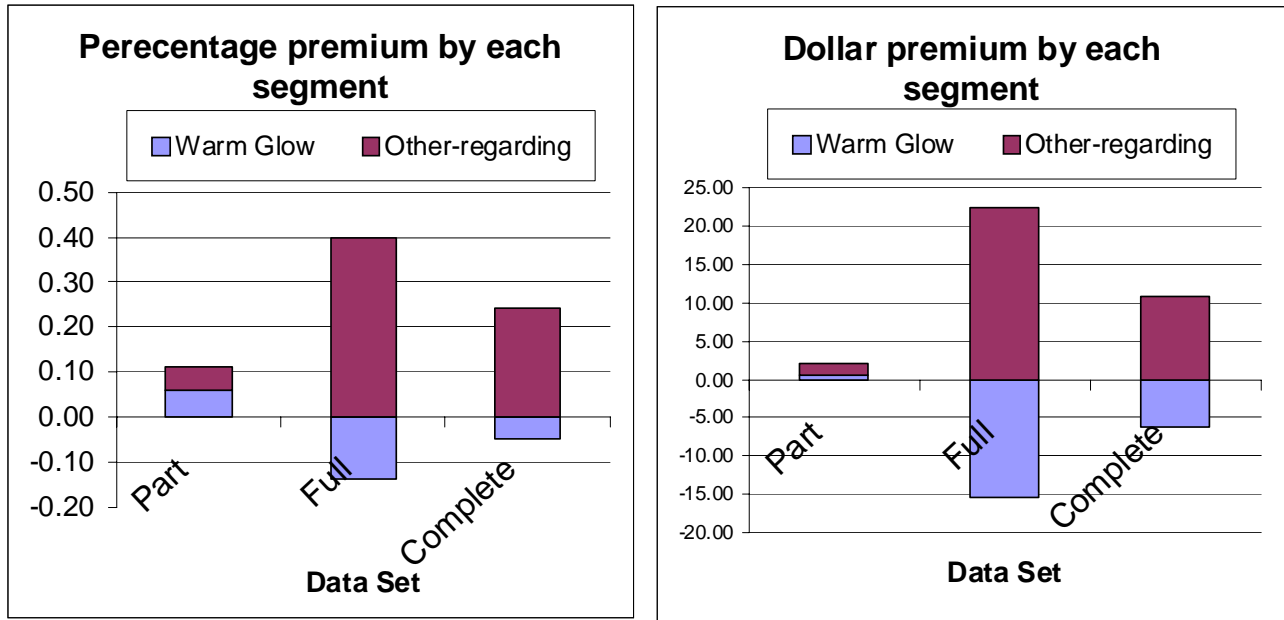
The bid increment is the empirical bid increment from the data multiplied by a variance parameter uniformly distributed between -3 and 5. This feature adds price variance that replicates the

actual price variance observed in the data. It also breaks the artificially sequential nature of bidding (which would not be consistent with the data), and ensures that nearly half the bids are too low to be counted, so it brings the simulated average number of bids per bidder to the empirically observed average.

In summary, the fine-tuning of the simulation parameters involved one parameter—the variance parameter on bid increments. This parameter was calibrated to minimize simulated price deviations from observed price deviations. The multiplier on the number of bids was defined as the inverse of the proportion of rejected (too low) bids, so that the number simulated bids would be close to the number of observed bids. However, due to other factors (like charity preferences), that multiplier had to be slightly adjusted from that inverse to make these two numbers match. Other summary statistics neatly fell in line. All in all, the average number of bids, average prices, charity price premiums, price variance, and number of bids variance closely (albeit not perfectly) correspond to the data.

The simulations can provide counterfactuals. In other words, they permit us to answer ‘what if’ questions regarding the charity premium in absence of one or more segments. The charity premium in the absence of the two charitable segments does not require a simulation to resolve. If all bidders were non-charitable, the charity premium would be zero. However, taking out either of the two charitable segments results in interesting insights. The first two bars in each figure below show the relative contribution of each segment to the charity premium in each subset of the data. The last bar in each figure shows the corresponding contribution for the complete data set.

Figure 1. Results of simulations showing contributions of charitable segments to charity premium



For the entire data set, we see that the warm glow segment actually brings a negative contribution to the charity premium. This means that taking the warm glow segment out of the population, leaving all other bidders in the auction, would have increased the charity premium by 5%. In other words, these seemingly charitable warm glow bidders are actually detrimental on average to the charity premium over the entire data set. This is because these warm glow bidders are relatively more price sensitive than they are charitable for high donation differences (which they negatively value). At the high donation difference, the other-regarding charitable bidders would like to drive up the premium, but the warm glow bidders, together with the non-charitable bidders, keep that increase in check.

In the partial donation pairs, in contrast, the donation differences are sufficiently small that the warm glow bidders find the warm glow component exceeding their disutility from the price difference and donation difference. The price difference is not too high since the other-regarding bidders do not find the difference as meaningful as in the full donation case. In these auctions, the warm glow bidders actively and positively contribute towards the charity premium.

5. Discussion

Our first result is the finding that a charity premium is significant and substantial in simultaneous auction pairs that are identical in all but percentage donated to charity. A second result is that this premium depends most crucially on the donation percentage difference between the auctions in a pair. To date, this is the cleanest empirical demonstration of such an effect for two reasons. First, the design eliminates all confounds naturally arising from different times, different sellers, and other small differences (pictures, description, durations, shipping charges, insurance, etc.). Second, we have a careful control for the percentage amount by varying the percentage for both auctions in a pair in a manner that allows us to capture the effect over a range of donation percentages, and the differences between them.

We find that individuals can be classified into three segments. One that is sensitive to prices only, one that likes to select the higher donation auction regardless of percentage difference, and one that pays attention to the donation difference. All three segments are sensitive to prices. When the price differences between auctions of different charitable contributions are small to moderate, the second segment—which we call the warm glow segment, appears to drive up the charity premium. However, in the full difference condition, where the price differences are more substantial, many warm-glow consumers appear reluctant to choose the charity auction and it is the percentage-sensitive consumers that drive up the premium. This effect might be partially offset by the segments of price-sensitive bidders.

Our results provide further evidence of a significant proportion of charitable consumers. There has been an active debate in the literature regarding whether consumers are charitable or selfish utility maximizers. The current results are consistent with findings by previous research which has reported consumer segments with different degrees of charitable intent. For example, Ledyard (1995),

Andreoni and Vesterlund (2001), and Supphellen and Nelson (2001) reported that between 40% to half of their subjects could be classified as selfish, while the remaining were charitable. Accordingly, we observe different segments of consumers with varying degrees of charitable preferences. Charitable preferences appear stable as consumers identified as charitable tend to bid in charity auctions while those identified as less charitable bid mostly in non-charity auctions.

Furthermore our results provide important insights into different charitable segments with varying charitable motives. We observe one segment of individuals who give because of unselfish concern for the welfare of others (e.g. they reveal true pro-social or altruistic preferences) and a segment of individuals who give for more selfish reasons.

6. Managerial Implications

Viability of cause related donation in auctions. A business with the objective of maximizing profits finds it profitable to engage in cause-related donations when the incremental profit from a \$1 donation exceeds the \$1 donated. This incremental profit typically comes from tax write offs and the value of goodwill. This means that for a non-auction item, the value of goodwill should be about sixty plus cents on the dollar. For auction items, unlike non-auction items, the presence of a charity contribution actually increases the price of the item by approximately a third. This drastically increases the profitability of cause-related donations, making the break-even value of goodwill a much smaller fraction of a dollar donated.

Optimizing the donation percentage. It is a difficult problem for firms to decide what percentage of proceeds to donate to charity in cause-related campaign. A donation of 100% is often unreasonable since it eliminates profits entirely. But 1% may be too small to generate goodwill. Our analysis allows managers to quantify this decision's impact on revenues. Each 1% added in donation increases the sale price by about 0.65% when donation percentages are moderate but substantially less when donation

percentages are high. Thus, a business can find its profit maximizing donation percentage by balancing costs and benefits of each percentage point in donation. The declining benefit of much higher donation percentages was shown with a large number of auctions giving 100% donations, but the bulk of the remaining auctions are in the moderate range, so the exact curvature of the marginal revenue from charity must be left for future research.

Segmentation and targeting. In an auction setting, the price one consumer is *willing to pay* increases the price the winning bidder *actually pays*. Hence, a charitable consumer who gains utility from charitable contributions imposes a price externality on consumers who have no regard for such contributions. This makes the charitable consumers more important to identify and promote to in an auction setting. In other words, the price externality of a charitable consumer on a non-charitable consumer must be incorporated into targeting and promotion decisions.

Reserve price. One of the most important auction decisions made by a seller is the reserve price—the minimum price or starting bid—on the item. Firms can eliminate the risk of selling the item at a price too low by setting a sufficiently high reserve price. However, given the snowballing effect of the charitable effect due to consumer stickiness to the same auction, firms will find it beneficial to set a very low reserve price to get as many bidders to enter early. Once bidders enter, they will generally not leave as the charity premium emerges.

7. Limitations and Future Extensions

The first and natural question to any experimental study is external validity. Particularly, would the results we reported here hold on eBay charity auctions or other charity auctions? Without further research on different platforms, we can only speculate on the applicability to other platforms. However, we can safely say that this particular auction site is a substantial and well-recognized market in the

geographical area in which it is run, and is in fact a primary fund-raising vehicle for local charities.

This allows us to say that the implications have a direct and meaningful impact on a number of large charities serving millions of constituents.

A second possible limitation relates to our ability to map the response function to the entire range of possible donation percentages and percentages differences. We studied essentially two designs- one that entailed 100% charity donation difference (the full donation set) and another that entailed moderate donation differences (the partial donation set). That design allowed us to contrast the two scenarios but not to get a full read on all possible configurations, especially in the intermediate-high range of donation percentages and percentage differences.

A third limitation involves our inability to pinpoint product classes that are more ideal for charitable auctions. Clearly, one might expect different charitable reactions to different products, such as frivolous products (Strahilevitz and Myers, 1998), and we find limited evidence to that effect. One might also expect different bidder mixes for different products and product classes, which may significantly affect charity premiums. However, we did not systematically study product class, and more research is needed to do so. The fit between the product class and the charity remains a largely unexplored area.

A fourth limitation pertains to the dynamics of charitable preferences and bids. It is of interest to see whether bidders who experience bidding and winning in charity auctions increase or decrease their propensity in subsequent auctions to bid a charity premium. It is conceivable that warm glow and other-regarding bidders will react differently to experiences. We would need more repeated observations-- especially on repeated wins-- to be able to report a meaningful analysis on dynamics.

References

- Andreoni, James (1989), "Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence," *Journal of Political Economy*, 97(6), 1447-58.
-
- (2006), "Philanthropy," *Handbook of Giving, Reciprocity and Altruism*.
- and Lise Vesterlund (2001), "Which Is the Fair Sex? Gender Differences in Altruism," *Quarterly Journal of Economics*, 116, 293-312.
- Becker, Garry S. (1974), "A Theory of Social Interactions," *Journal of Political Economy*, 82(6), 1063-93.
- Brown, T.J. and Dacin, P.A., (1997), "The Company and the Product: Corporate Associations and Consumer Product Responses," *Journal of Marketing*, 61(1), 68-84.
- Carpenter, Jeffrey, Jessica Holmes and Peter Matthews (2008), "Charity Auctions: A Field Experimental Investigation," *Economic Journal*, 118, 92-113.
- Eckel, C. C., P.J. Grossman and M.R. Johnston (2005), An experimental test of the crowding out hypothesis, *Journal of Public Economics* **89**, 1543–1560.
- Engers, Maxim P. and Brian P. McManus (2007), "Charity Auctions," *International Economic Review*, 48(3), 953–994..
- Ettinger, David (2003), "Bidding among friends and enemies," Unpublished working paper, University College London.
- Fehr, Ernst and Urs Fischbacher (2003), The Nature of Human Altruism, *Nature*, 425, 785-791.
- Fisher, Robert J., Mark Vandenbosch and Kersi Antia (2008), "The Effects of Content, Placement, and Delivery Characteristics on Televised Fundraising for Nonprofit Organizations," *Journal of Consumer Research*, Vol.35, No.3,519-31.
- Glazer, A., K.A. Konrad (1996), "A signaling explanation for private charity," *American Economic Review*, 86(4), 1019-28.
- Goeree, Jacob K., Emiel Maasland, Sander Onderstal, and John L. Turner (2005), "How (Not) to Raise Money," *Journal of Political Economy*, 113(4), 897–918.
- Handelman, J and S. Arnold (1999), "The role of marketing actions with a social dimension: Appeals to the institutional environment," *Journal of Marketing*, 63(3), 33–48.
- and ---- (2005), "Silent Auctions in the Field and in the Laboratory," *Economic Inquiry*, 43, 715-33.
- Kamakura, W. A. and G. J. Russell (1989), "A Probabilistic Choice Model for Market Segmentation and Elasticity Structure," *Journal of Marketing Research*, 26(4), 379-90.
- Konow, J., (2004). Mixed feelings: theories and evidence of warm glow and altruism. Loyola Marymount University Working Paper.
- Ku, Gillian, Deepak Malhotra, and J. Keith Murnighan (2005), "Towards a competitive arousal model of decision making: a study of auction fever in live and internet auctions," *Organizational Behavior and Human Decision Processes*, 26, 89-103.
- Ledyard, John O. (1995), "Public Goods: A Survey of Experimental Research," In John H. Kagel & Alvin E. Roth (Eds.), *The Handbook of Experimental Economics*, Princeton, NJ: Princeton University Press.
- Lichtenstein, Donald R., Minette E. Drumwright and Bridgette M. Braig (2004), "The Effect of Corporate Social Responsibility on Customer Donations to Corporate-Supported Nonprofits," *Journal of Marketing*, 68(4), 16-32.
- Luo, Xueming, Rebecca and C B Bhattacharya (2006), "Corporate Social Responsibility, Customer Satisfaction, and Market Value," *Journal of Marketing*, 70 (24), 1-18.
- Navarro, Peter (1988), "Why Do Corporations Give to Charity?," *The Journal of Business*, 61(1), 65-93.

- Pracejus, John W., G. Douglas Olsen and Norman R. Brown (2003) "On the Prevalence and Impact of Vague Quantifiers in Cause Related Marketing," *The Journal of Advertising*, 32(4), 19-28.
- Roberts, Russel D. (1984), "A Positive Model of Private Charity and Public Transfers," *Journal of Political Economy*, 92(1), 136-48.
-
- Romano, Richard and Yildirim, Huseyin (2001), "Why Charities Announce Donations: A Positive Perspective," *Journal of Public Economics*, 81(3), 423-47.
- Rose-Ackerman, Susan (1996), "Altruism, Nonprofits and Economic Theory," *Journal of Economic Literature*, 34(2), 701-728.
- Salmon, Timothy C and R. Mark Isaac (2006), "Revenue from the Saints, the Showoffs and the Predators: Comparisons of Auctions with Price-Preference Values," in *Research in Experimental Economics*, Vol. 11, Experiments Investigating Fundraising and Charitable Contributions, R. Mark Isaac and Douglas D. Davis, Editors, 1-30.
- Sen, S. and C.B. Bhattacharya (2001), "Does Doing Good Always Lead to Doing Better? Consumer Reaction to Corporate Social Responsibility," *Journal of Marketing Research*, 38(2), 225-43.
- Strahilevitz, Michal and John G. Myers (1998), "Donations to Charity as Purchase Incentives: How Well They Work May Depend on What You Are Trying to Sell," *Journal of Consumer Research*, 24(4), 434-46.
- Supphellen, Magne and Michelle R. Nelson (2001), "Developing, exploring, and validating a typology of private philanthropy decision making," *Journal of Economic Psychology*, 22(5), 573-603.
- Varadarajan, P. Rajan and Anil Menon (1988), "Cause-Related Marketing: A Coalignment of Marketing Strategy and Corporate Philanthropy," *Journal of Marketing*, 52(3), 58-74.
-
- Vohs, Kathleen D., Nicole L. Mead, and Miranda R. Goode (2006), The Psychological Consequences of Money, *Science*, 314, 1154-1156.

Appendix A. Summary Details on the Auction Batches

| | Duration | Number of Auctions | Donation Percentages | Avg. \$ Bid Amount | Avg. number of bidders per auction |
|----------------------|---|---------------------------|--------------------------------|---------------------------|---|
| Batch 1 | November 3 – 5, 2004 | 276 | 0 or 100% | \$13.84 | 3.1 |
| <i>Products Sold</i> | Art, CDs, collectables stamps, computer accessories, electronics, gift certificates, handcrafts, jewelry. | | | | |
| Batch 2 | April 21–26, 2006 | 96 | 10, 20, 30 or 40% | \$18.64 | 3.0 |
| <i>Products Sold</i> | Cosmetics, gift certificates, fitness equipment, golf equipment, household items, tools. | | | | |
| Batch 3 | October 14 – 17, 20 – 21, 2006 | 124 | 0, 1, 25, or 50% | \$9.0 | 2.9 |
| <i>Products Sold</i> | Collectables stamps, computer accessories, electronics, games, handcrafts, tools, toys. | | | | |
| Batch 4 | October 31 – November 2, 2006 | 104 72 | 10, 20, 30 or 40% 0 or 100% | \$12.53 \$23.42 | 2.7 3.2 |
| <i>Products Sold</i> | Computer goods and electronics. | | | | |

Appendix B. Survey Results of Registered Users of the Local Auction Market (n = 133)

1. Do you normally plan in advance how much you spend on donations?

50.8% Yes (Yes)

49.2% No (No)

2. Do you normally plan in advance to which organization(s) you donate to?

52.4% Yes (Yes)

47.6% No (No)

3. How many people live in your household?

16.7% One (One)

27.8% Two (Two)

23.0% Three (Three)

19.8% Four (Four)

10.3% Five (Five)

2.4% Six or more (Six or more)

4. What age of children live in your household?

62.7% There are no children living in my household (1)

5.5% Pre-school aged children only (2)

1.6% Both pre-school and school aged children (3)

30.1% School aged children only (4)

5. In the past 12 months, how much have you donated to charity?

6.3% Less than \$25 (1)

21.4% \$25 to less than \$100 (2)

23.0% \$100 to less than \$250 (3)

19.8% \$250 to less than \$500 (4)

10.3% \$500 to less than \$1,000 (5)

6.3% \$1,000 to less than \$2,500 (6)

8.7% \$2,500 to less than \$5,000 (7)

4.0% More than \$5,000 (8)

6. In the past year, how many times have you participated in a charity auction?

Mean = 4.66, variance = 47.06

7. What is your gender?

60.0% Male (male)

40.0% Female (female)

8. What is your age?

16.8% 15 to 24 (1)
16.0% 25 to 34 (2)
25.6% 35 to 44 (3)
26.4% 45 to 54 (4)
13.6% 55 to 64 (5)
1.6% 65 and over (6)

9. What is your current marital status?

60.0% Married or common-law (1)
30.4% Single, never married (2)
8.0% Separated or Divorced (3)
1.8% Widow or widower (4)

10. What is your approximate total gross household income?

8.9% Less than \$20,000 (1)
9.7% \$20,000 to \$39,999 (2)
15.3% \$40,000 to \$59,999 (3)
24.2% \$60,000 to \$79,999 (4)
19.3% \$80,000 to \$99,999 (5)
22.6% \$100,000 or more (6)

11. What is the highest level of education you have completed?

1.6% Less than high school (1)
9.6% Graduated from high school (2)
27.2% Some postsecondary (3)
23.2% Postsecondary diploma (4)
24.0% University degree (5)
14.4% Post-graduate degree (6)

12. What is your employment status?

84.9% Employed (1)
15.1% Unemployed, but not actively looking (2)

13. What is your religious involvement?

8.1% Religious and attends services weekly
49.2% Religious but does not attend services weekly
42.7% Not religious at all

14. Are you a student right now?

19.2% Yes
80.8% No