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# Does Cheap Talk Affect Market Outcomes? Evidence from eBay†

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*We study cheap talk by firms and responses by their consumers, focusing on unverifiable promises of charitable donations on eBay during 2005–2006. Cheap talk listings have lower sales probabilities but sell at higher prices when successful. The negative relationship between cheap talk and sales is concentrated in the months following Hurricane Katrina, a time when verifiable and unverifiable charity listings increased dramatically. Finally, we show that cheap talk sellers have lower quality ratings than those making verifiable donations. Our results suggest that buyers (justifiably) avoid cheap talk listings when credible quality signals are available, thus limiting the extent of cheap talk.* (*JEL* D12, D82, D83, L15, L31, M31)

Unverified claims by sellers are ubiquitous in the marketplace, despite the fact that, in most settings, they convey little to no information. As Gardete (2013, 609) writes, "because the source of the information is an interested party, [claims] can be biased so as to cater to [the seller's] interests … [For example, t]he automotive manufacturer may boast about the stability and driving comfort of a new model, the supermarket may claim to have the best prices or best produce in town, and a real estate agent may highlight photos of the exquisite art nouveau handrails, digitally enhanced to look appropriately exquisite." The firm's cost of such cheap talk may be low, but it is nonzero, given that it potentially crowds out other information a seller may wish to communicate. The persistence of cheap talk raises a number of questions on whether and how it impacts markets. In particular, does cheap talk affect consumer choices or do consumers ignore it? If a sufficiently large fraction of consumers take cheap talk at face value, can it crowd out efforts at providing verifiable quality information? Conversely, how do mechanisms that independently verify claims affect the prevalence of cheap talk?

The answers to these questions have significant implications both for policy and market design. If most consumers are sophisticated enough to distinguish between credible information and cheap talk, its effect on the market may be limited;

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however, if a sufficient fraction of consumers are naïve, direct oversight or regulation may instead be required to prevent the market from unraveling. Quantifying the prevalence of cheap talk, as well as analyzing consumers' responses to it, is central to discussions dating back to Beales, Craswell, and Salop (1981) on the role of legal regulation intended to protect consumers from misleading advertising,[1] as well as more recent explorations of the design of two-sided platforms that compete, at least in part, by attracting sellers who meet buyers' expectations (Nosko and Tadelis 2015, Tadelis 2016).

We examine the prevalence and consequences of cheap talk about an activity—charitable giving linked to product purchases—for which consumers often value the activity but potentially have difficulty verifying it directly. Charity may be directly valuable to consumers, either from direct utility (warm glow) or as a signal of trust or reliability (Elfenbein and McManus 2010; Elfenbein, Fisman, and McManus 2012). But seller claims about charity or other good deeds are notoriously difficult to monitor by individual consumers, giving rise to concerns about selective or deceptive reporting of these actions by firms. (In the popular press, the term "greenwashing" is used to describe seller claims about environmental good deeds that are not backed up by the associated costly actions.) While researchers have studied the impact of verifiable charity tie-ins or pro-social production on consumer decisions (e.g., Hainsmuller, Hiscox, and Sequiera 2015; Canals-Cerda 2014; Andrews et al. 2014; Dubé, Luo and Fang 2015), we know of only a single study—conducted in a lab setting—that examines the impact of credibility of donations on market outcomes (Feicht, Grimm, and Seebauer 2016).

The eBay platform, our setting for this paper, has several features that make it well-suited to studying charity cheap talk. In the period we study, verifiable and non-verifiable charity tie-ins coexisted on eBay. Sellers' unverifiable charity claims were straightforward to identify across a variety of products via a short list of keywords used in the title field of product listings.[2] At the same time, eBay's charity program, Giving Works (GW), gave sellers an opportunity to link their listings to verified charitable contributions through a system that was easy to use and provided cost and tax advantages. This provides a clear benchmark against which to compare the outcomes of cheap talk listings. While our main interest is in buyers' responses to cheap talk, in the discussion that follows, we refer to sellers' unverified promises to make donations contingent on a product sale as "unverified charity claim" (UCC) listings, given our inability to discern the seller's true intentions.

We examine data across all product categories for listings that end between March 2005 and May 2006. We first observe that cheap talk charity listings were a relative rarity on eBay during the period we study, comprising only about a thirtieth of the number of legitimate charity listings. Furthermore, cheap talk charity listings perform relatively poorly: controlling for seller identity, product category,

[1] Recognizing the potential impact of unverified, self-serving claims on consumers and markets, Section 5 of the Federal Trade Commission Act prohibits "deceptive acts…affecting commerce" (15 USC 45); according to the FTC's Bureau of Consumer Protection, "advertising must tell the truth and not mislead consumers. A claim can be misleading if relevant information is left out, or if it implies something that's not true" (FTC Bureau of Consumer Protection 2000, 2).

[2] Examples include adding the phrases "Katrina Benefit" or "Charity Auction" to the listing title.

starting price, and a host of other listing attributes, we find that, for the full sample period, UCC auction listings are 13 percentage points less likely to sell than listings that make no charity claims, whereas listings with verifiable (GW) charity-linked listings are 7 percentage points more likely to sell, relative to non-charity listings. (Comparing UCC listings to GW listings that also promise donations explicitly in their titles, the difference is even larger.) These findings are, at least prima facie, difficult to reconcile with consumers placing any value on cheap talk claims, or even simply disregarding cheap talk. Furthermore, these initial results suggest that the supply of cheap talk listings may be limited, in large part, because of the negative response it elicits from consumers. Why, then, do any sellers nonetheless make cheap talk claims?

To better understand the consumer response to cheap talk listings, we examine how UCC versus GW listings' sales probability and price vary throughout our sample. In particular, we take advantage of the very large increase in both GW and UCC listings (225 percent and 350 percent, respectively) during the months immediately following the landfall of Hurricane Katrina; we interpret the listings increase as stemming from high anticipated demand for charity-linked listings. The increased availability of GW listings was associated with both higher sales probabilities and prices, consistent with an upward shift in demand for verifiable charity-linked listings. However, for UCC listings, the sale probability of UCC auction listings dropped by 31 percentage points, a roughly 70 percent decline. Despite this decline in sales probability, consumers who purchased UCC items following Katrina paid significantly higher prices. Outside the post-Katrina increase in charity-linked listings, cheap talk had no effect (or a weak positive effect) on a listing's sale probability or price.

The divergent responses of consumers to the increased availability of charity-linked listings during Katrina is consistent with the presence of only a small number of consumers who are willing to buy products with unverified claims even when a legitimate alternative is available. (We interpret the increased availability of UCC listings post-Katrina as a failed experiment on the part of UCC sellers.) When combined with the relatively small number of UCC listings available and the lack of any effect of UCC on listing outcomes outside of the Katrina period, this interpretation further suggests that the simultaneous availability of products with verified quality may be sufficient to severely curtail cheap talk. In such cases, optimal public policy or platform design may tilt toward supporting verification institutions instead of emphasizing regulation or oversight to police fraud and deception. To some degree, the availability of verified alternatives may effectively allow the market to police itself.

We conclude our empirical analysis by exploring the attributes of sellers in the market who make UCC listings, with the aim of understanding why most buyers avoid them. We find that UCC sellers are of lower quality relative to GW sellers across a variety of measures. This raises the intriguing possibility that cheap talk—even if unrelated to the product's main attributes—may be broadly construed as a negative signal of seller quality by all but the most naïve of consumers.[3]

[3] This is evident in the advice of eBay advice-givers, many of whom suggest that it is best to stay away from listings that use terms like "authentic" or "genuine" in their product descriptions. As one eBay expert put it, "the

Despite the academic and policy importance of cheap talk and potentially fraudulent statements, practical difficulties in collecting appropriate field data have resulted in little prior empirical research outside of the lab.[4] The most direct precedent for our paper is Jin and Kato (2006), who study baseball card sellers on eBay in 2001–2002. They find that sellers who make unverifiable claims receive much higher prices, but do not provide cards of higher quality. Cawley, Avery, and Eisenberg (2013) investigate whether advertisements for (largely worthless) weight loss medication influence drug sales and health, and find no demand response to the ads. Zinman and Zitzewitz (2016) analyze ski resorts' self-reported snowfall, and find that it is consistently higher than comparable government figures, a gap that widens during weekends and other periods when demand would be expected to be higher. Whereas these earlier papers focus on highly specific individual markets, and tend to emphasize only the demand or supply side of the market, our analysis considers the activity and characteristics of large and varied populations of buyers and sellers.[5]

Our paper also contributes to the emerging body of research that considers how poorly informed or naïve agents affect seller decisions and the functioning of markets. Prominent contributions include Nagler (1993), DellaVigna and Malmendier (2006), Gabaix and Laibson (2006), Malmendier and Lee (2011), Woodward and Hall (2012), and Akerlof and Shiller (2015). Our conclusions are tentatively optimistic: in our setting (in which a verified alternative is available) most buyers avoid sellers who make unverifiable claims, a heuristic that may serve them well given the lower average quality of UCC sellers.

Insofar as we examine unverifiable claims of altruistic or other-regarding behavior, our paper also relates to studies of greenwashing (Laufer 2003, Lyon and Maxwell 2011). While Delmas and Burbano (2011) discuss the potential impact of greenwashing on consumer behavior, we are aware of no studies that document it empirically.[6]

## I. eBay, Giving Works, and Unverified Charity Claims

Founded in 1995, eBay has become one of the world's largest facilitators of e-commerce, claiming more than 162 million active buyers and 800 million annual product listings globally.[7] Online markets, and eBay in particular, have increasingly become an object of study for economists, who have examined them to address

more [100% genuine] is mentioned in the listing the less likely I am to believe it." This quote is available at http://www.ebay.com/gds/HOW-TO-TELL-IF-AN-ITEM-IS-A-FAKE-/10000000002765872/g.html.

[4] The marketing literature offers many examples of laboratory experiments on deceptive advertising, e.g., Johar (1995) and Darke and Richie (2007). In the economics literature, lab experiments have focused on cheap talk and deception in more stylized game theoretic settings, e.g., Croson, Boles, and Murnighan (2003) and Gneezy (2005).

[5] We note that cheap talk need not involve misleading claims and may serve to increase welfare. Crawford and Sobel (1982) shows that cheap talk can, even in the presence of some incentive to lie, carry some information for counterparties. Gardete (2013) examines a model in which cheap talk reduces the cost of consumer search. See Farrell and Rabin (1996) for a discussion of the role of cheap talk in exchange more generally.

[6] Empirical studies of greenwashing have focused, to our knowledge, on the correlation between firms' claims of environmental performance and their actual track records. See Cho and Patten (2007) and Clarkson et al. (2008) for examples.

[7] Source: eBay 10K–2015.

a variety of questions.[8] On the eBay platform, sellers offer an item for sale by providing a description of it, disclosing a small amount of personal information, and specifying an ending time and method for the sale. Buyers on the platform generally cannot inspect the item prior to purchase, nor do they engage in face-to-face communication with sellers. It is critical, therefore, that buyers trust sellers to deliver the product as described. eBay's public filings acknowledge that "[f]ailure to deal effectively with fraudulent activities on our websites would increase our loss rate and harm our business, and could severely diminish consumer confidence in and use of our services." eBay has promoted several mechanisms to limit opportunistic behavior by sellers, including reputation scores, money-back guarantees, and seller certification (see Cabral and Hortasçu 2010; Hui et al. 2016; and Elfenbein, Fisman, and McManus 2015, respectively, for empirical evidence of the impact of these mechanisms).

### A. *Giving Works*

A parallel feature of the eBay platform, originally called Giving Works, was launched in 2003 to enable sellers to raise money for charitable causes through their product sales.[9] When listing an item for sale, a seller can use the Giving Works (GW) program to link her product to a specific charitable cause. The seller chooses a donation rate between 10 and 100 percent of the final sale price in 5 percent increments, which eBay collects directly if the listing results in a sale. Benefits for the seller include higher sale prices and/or higher probability of sale (Elfenbein and McManus 2010; Elfenbein, Fisman, and McManus 2012), a rebate of listing fees proportional to the donation rate, and tax account records documenting the seller's donation. A significant number of sellers engage in both GW listings and "standard" listings with no charity connection; generally, these sellers list a minority of their items via GW. A buyer can be confident that the promised donation will be made to a GW listing's associated charity, as eBay makes clear that the platform itself receives the buyer's payments and disburses the appropriate funds to the charity and seller.

### B. *Unverifiable Charity Claims*

Independent of the fraction of total sale price donated, GW represents the most efficient way for sellers to engage in charity-linked sales. eBay provides 100 percent of the donated amount to charity and improves the seller's net revenue by rebating listing fees by the same fraction the seller pledges to donate. Nonetheless, in the early years of the Giving Works program, eBay allowed sellers to include claims about charitable donations in a listing's title, subtitle, or description. For example, a September 2005 listing for a toy train set included the subtitle "Hurricane Katrina Relief Red Cross Donation W/Purchase." Near the end of our selected sample

[8] Bajari and Hortasçu (2004) describes many of the institutional features of eBay in a review of the early empirical literature on internet auctions. Einav et al. (2018) describes changes in the eBay platform and in seller behavior from 2003 to 2009.

[9] In 2015, this program was re-labeled "eBay for Charity."

period, however, eBay placed restrictions on non-GW charity listings and threatened noncompliant listings with removal.[10] Current policy requires that non-GW listings with charity claims must include an image of a letter of support from a recognized 501(c)(3) charity. Consistent with this policy having a material impact on unverified charity claims, the ratio of UCC items available (identified by the method described in Section II) to total items listed on eBay dropped by 90 percent between March 2006 and March 2016, while the ratio of GW items increased by over 400 percent.[11]

Why would sellers make unverifiable charity claims when GW is available? One possibility is that these sellers were motivated by altruistic considerations, but were unaware of or inexperienced in using GW and therefore avoided it. We believe this is unlikely to be the case for most UCC sellers given that, as we discuss below, UCC sellers tend to be very experienced with the eBay platform, especially relative to sellers who post GW listings. Alternatively, these sellers may have sought the benefits of charity linkages, i.e., increases in sale price and/or sale probability, without the cost of making the donation itself, from consumers who take their charity claims at face value. A final possibility is that sellers simply wished to experiment with alternative selling strategies in order to learn the most effective ways to promote their goods.[12] Regardless of sellers' (unobservable) motivation, consumers taking a cautious view of UCC would have no reason to believe the donations would be made.

## II. Data

### A. *Sample Period and Data Extract*

We draw data from eBay's US platform and focus on listings that ended between March 1, 2005 and May 31, 2006. This centers our analysis on a period when both GW and UCC listings were relatively common on the site. (During the 12 months prior to our sample period, for example, GW volume was very low, with an average of 800 listings concluding each week.) We may thus examine consumer response to charity cheap talk at a point in time when a verifiable alternative was readily available to eBay sellers.

This sample period also focuses our analysis around the spike in charitable activity following Hurricane Katrina, which is an important aspect of our analysis, since we interpret Katrina relief efforts as a positive shock to demand for charity-linked listings. We identify the interval from August 29, 2005, when Katrina made landfall, until November 15, 2005 as the "Katrina period" or simply "post-Katrina." All other dates constitute the "non-Katrina" portions of the sample.[13]

[10] Source: private communication between the authors and eBay personnel.

[11] We see further evidence of eBay's policing of UCC listings in the months following the 2010 earthquake in Haiti, with a mass cancellation of listings we identify as containing unverified charity claims.

[12] Einav et al. (2015) documents extensive seller experimentation on the eBay platform.

[13] See Figures 1 and 2 for the strong drop-off in charitable activity in mid-November 2005. Our results are robust to alternative definitions of the Katrina period. See later sections of this paper for a discussion of the impact of ending the Katrina period on October 15 and online Appendix Table A1 for results using alternative definitions of the Katrina window.

We collect data on three broad types of eBay listings, with some potential overlap across types. First, to identify charity claims (whether or not they are backed up by a Giving Works donation), we search for all listings that contain strong language about charitable donations in the listing title or subtitle. (See the Data Appendix for the search terms we use regarding donations.) Each identified listing is associated with a seller and an eBay "leaf category," which is eBay's finest product category designation.[14] We identify 10,206 seller-category combinations in this step. We then download all US-based auction and fixed-price listings during our period of study by the same seller and in the same product category as any UCC listing.

We repeat the above procedure for Giving Works listings and collect all listings by sellers in product categories in which the seller posts a GW listing during the sample period. In this step, we identify 91,757 seller-category combinations, about 5,000 of which are also captured in the UCC-focused step. Between UCC and GW listings, we assemble about 34 million listings that are associated with the collected seller-category combinations. The vast majority of these listings are neither UCC nor GW. Third, in order to have a control set of listings from sellers who do not make charity-linked listings, we take the set of product categories that are identified in the previous steps for UCC and GW listings, and we draw a 0.1 percent sample that captures 1.2 million listings.

Once we have identified the listings described above, we obtain information on each listing's format (true auction or fixed price), its starting auction price or fixed price, the number of units offered if fixed price, the number of units sold and the sale price, the listing title and subtitle, the percentage donated via the GW system, the number of photos, the starting date and the scheduled and actual end dates, the shipping fee, the associated seller ID, and the leaf category ID. For listings that end in a sale, we collect the buyer ID for each unit purchased. A small fraction of auction listings (about 2 percent) include a secret reserve price that is above the start price. The listing goes unsold if the highest bid falls short of this reserve. We drop these auctions from our analysis.[15]

We use the seller and buyer IDs to obtain background information on each eBay user in order to generate proxies for seller reliability. We download each user's eBay creation date in order to calculate user age (in days) at the time of each listing captured within our sample. We collect information on users' accumulated positive feedback as of the first day of each month in the sample period. Because provided feedback is almost always positive, the feedback level is effectively a measure of seller experience rather than customer satisfaction. We link the seller's feedback score to the month and year of each listing in the data sample. In addition, we follow Nosko and Tadelis (2015) to compute for each seller the share of transactions on which she received positive feedback from a buyer, i.e., an "effective percent positive" feedback (EPP) measure. For each month in the sample period, we compute each seller's EPP over the previous two years and then link it to listings using the

[14] We use the terms "leaf category" and "product category" interchangeably in this paper. Our full data extract contains listings from over 14,000 leaf categories.

[15] Secret reserve prices are slightly more common (2.2 percent) among GW and UCC auctions than the non-charity listings (1.5 percent). Our results are unchanged if we include these listings in our analysis.

same procedure as for total feedback. The EPP measure may do a better job of capturing consumers' satisfaction than direct feedback measures given that, as Nosko and Tadelis observe, dissatisfied customers are more apt to leave no feedback rather than negative comments. Finally, we calculate each seller's share of positive feedback over the same rolling two-year window that we use for EPP.

### B. *Data Preparation Steps and Sample Characteristics*

We prepare the listing and user data in several steps. We begin by constructing a "descriptive sample" that we use to characterize overall UCC and GW activity, and, for this sample, we use nearly the full pool of listings described in the preceding section. Exceptions include listings with nonstandard conclusions (which might indicate that the seller posted a UCC listing rather than a GW one by accident, and closed the auction early); those with starting prices, ending prices, or shipping fees above $1,000; and those with more than 1,000 individual units for sale in a single fixed-price listing. In total, these exceptions lead to the removal of about 3.4 million listings, primarily due to abnormal endings for listings with no GW or UCC connection. In a final step, we directly inspected the 13,468 remaining UCC listings that we identified through our text-based search procedure. About 20 percent of these listings are false positives (e.g., memorabilia from celebrity charity auctions or tickets to Katrina benefit concerts), and we remove the UCC indicator for these observations.

We perform regression analysis on a subset of listings that we call the "analysis sample," for which we employ four additional filters. First, to reduce computation costs, we retain a maximum of 1,000 non-GW, non-UCC listings for each seller-category combination (i.e., if a seller operates in many categories, we retain 1,000 listings, selected at random, in each category in which he/she has a presence).[16] This step removes over 90 percent (27 million) of listings from the descriptive sample. Second, we identify all seller-category combinations in which the seller's listing outcomes have nonzero variance in the number of units sold. If a seller is successful (or unsuccessful) in all listings within a leaf category, the seller-category fixed effects we introduce below will lead to biased estimates of the impact of a listing characteristic (such as UCC status) on listing outcomes in a linear model with a binary dependent variable. See Elfenbein, Fisman, and McManus (2012, 2015) for additional discussion of this issue. This step eliminates about 20 percent of listings from the remaining descriptive sample in forming the analysis sample, mostly due to sellers with a single listing in a product category. Third, in the analysis sample, we focus on listings with a starting (or fixed) price greater than $2. This affects about 15 percent of the listings in the remaining descriptive sample.

In Table 1, we report summary statistics for the analysis sample. About 60 percent of the listings are true auctions (compared to only 20 percent in the descriptive

[16] For sellers with fewer than 1,000 non-GW and non-UCC listings in a product category, we retain all listings in the category. In our empirical analysis, these observations mainly serve to recover the values of seller-category fixed effects, and we conjecture that we can do this adequately with 1,000 observations per seller-category despite some opportunities to use more.

Table 1—Listing Characteristics

| | Mean | Median | SD | Min | Max |
|---|---|---|---|---|---|
| Auction listing | 0.61 | 1.00 | 0.49 | 0.00 | 1.00 |
| Fixed-price listing | 0.39 | 0.00 | 0.49 | 0.00 | 1.00 |
| Start or fixed price | 36.55 | 11.30 | 87.22 | 2.00 | 1,000.00 |
| UCC listing | 0.002 | 0.00 | 0.04 | 0.00 | 1.00 |
| GW listing | 0.08 | 0.00 | 0.28 | 0.00 | 1.00 |
| GW w/charity text | 0.003 | 0.00 | 0.05 | 0.00 | 1.00 |
| Number photos | 1.08 | 1.00 | 1.25 | 0.00 | 76.00 |
| Shipping fee | 4.92 | 3.99 | 7.25 | 0.00 | 900.00 |
| Quantity available | 3.91 | 1.00 | 22.82 | 1.00 | 1,000.00 |
| Scheduled length | 13.60 | 7.00 | 13.60 | 1.00 | 90.00 |
| Observations | 3,095,456 | | | | |

*Notes: Start or fixed price* provides the start price of auction listings and the (fixed) sales price for fixed-price listings. *UCC listing* denotes that the title of the listing makes an unverified charity claim. *GW listing* denotes that the listing has associated with it a verified charitable contribution made via eBay's Giving Works program. *GW w/charity text* denotes that a listing both has charity-related text in its title and also a verifiable Giving Works donation associated with it. *Quantity available* is the number of items available in a listing, equal to one for all auction listings. *Scheduled length* is the time in days that a listing is posted for. *Number photos* and *Shipping fee* are self-explanatory. See text for further details.

sample); the remainder are fixed-price listings. A key attribute of the data is that both fixed price and auction listings do not always result in a sale. For auction listings in our sample, a listing does not result in a sale when no buyer is willing to bid more than the start price of the auction. In the analysis sample, about 40 percent of listings resulted in a sale of one or more units.[17] The median (mean) start price for an item is \$11.30 (\$36.55). For auctions, the median sales price for listings that end in a sale is about 50 percent greater than the median start price, and the mean sales price is a third greater than the mean start price. (We do not present summary statistics on sale probabilities or prices to preserve confidentiality of eBay's data.) The median listing has a shipping fee of \$3.99 and lasts for 7 days, which is also the modal duration for true auctions. GW listings account for 8 percent of the sample, a level that is much higher than for eBay overall—this is a natural result of the sample construction. There are 5,948 UCC listings in the analysis sample; these listings comprise about 0.2 percent of total observations.

In Table 2, we focus on listings that are either GW or UCC in the analysis sample. (By definition, a listing cannot be both GW and UCC.) GW listings are about 30 times as common as UCC listings, which make up only 2 percent of the group summarized in Table 2. Among GW listings, donation pledges of 100 percent are most common during the sample period. The remaining GW listings are split evenly between revenue pledges of 10 percent and values in the 15–95 percent range. We highlight separately GW listings with charity-related text for listings with the same words or phrases in their titles as we used to identify UCC listings.[18] These are

[17] Einav et. al (2018) documents the shift of seller choices about sales format on eBay from being predominantly auctions in the early 2000s to predominantly fixed price in the late 2000s. Our study takes place in the middle of this shift.

[18] We inspected a sample of these listings for false positives as we did for UCC listings, but in all cases, the charity-related text did in fact advertise the sellers' donations.

Table 2—GW or UCC Listing Characteristics

| | Mean | Median | SD | Min | Max |
|---|---|---|---|---|---|
| UCC listing | 0.022 | 0.00 | 0.15 | 0.00 | 1.00 |
| GW listing 10% donated | 0.090 | 0.00 | 0.29 | 0.00 | 1.00 |
| GW listing 15%–95% donated | 0.089 | 0.00 | 0.29 | 0.00 | 1.00 |
| GW listing 100% donated | 0.752 | 1.00 | 0.43 | 0.00 | 1.00 |
| GW w/charity text | 0.034 | 0.00 | 0.18 | 0.00 | 1.00 |
| Observations | 265,754 | | | | |

*Notes:* The table provides summary statistics for the subsample of listings that are associated with either unverifiable charity claims (UCC) or verifiable charity claims made via Giving Works (GW). We disaggregate GW listings based on the fraction of the sale price that is donated to charity. *GW w/charity text* denotes that a listing both has charity-related text in its title and also a verifiable Giving Works donation associated with it. See text for further details.

about as common as UCC listings. In our analysis below, these listings serve as a second comparison group for UCC listings: they implicitly use the same syntactic structure in their titles, but offer verifiable, rather than unverifiable, donations.

In Figures 1–4, we explore the temporal patterns in UCC listings over the sample period. Figure 1 displays the (smoothed) number of descriptive-sample listings per day that are GW, GW with charity-related text, and UCC. We use a log scale on the vertical axis, given the vastly different daily flows of GW and UCC listings. Both GW and UCC listings increased substantially when Hurricane Katrina struck, and then diminished over the next six weeks. UCC listings had other periods when they increased in frequency, in particular the 2005 holiday season and each spring. Figure 1 shows that GW listings with charity text were generally less common than UCC listings on eBay, with the exception of the Katrina period. Despite the sizable increase in UCC listings during the Katrina period, in Figure 2 we show that total sales per day did not increase by nearly as much.[19] Instead, the Katrina-period UCC sales per day is on the same scale as other periodic up-ticks in UCC purchases during the sample period. In Figure 3, we provide a clearer representation of patterns in sales rates by plotting the analysis sample's smoothed daily sales percentages for UCC listings (in blue), all GW listings (red), and non-UCC non-GW listings (green) in the analysis sample.[20] While UCC and GW listings are often noticeably different from each other, the Katrina period stands out for the depth of decline in UCC sale probability and the fact that the GW sale probability moves distinctly in the opposite direction. As an alternative representation of the different patterns of UCC and GW activity, in Figure 4 we plot the UCC to GW ratios of listings and sales. The initial downward trend in both ratios is due to the rise of GW relative to UCC, as shown in Figure 1. More interestingly, we can see that while the ratios of listings and sales co-move outside of the Katrina period, at the beginning of the Katrina period there is a large increase in the UCC/GW listings ratio while the sales ratio remains flat. However, after this initial spike, which lasted about two weeks after Katrina's landfall, the listings ratio almost immediately drifts back toward its pre-hurricane value.

[19] As may be inferred from Figure 3, there is also a large increase in GW sales during Katrina. We omit this line from Figure 2, given the very different average levels of GW and UCC listings.

[20] We omit Figure 3's vertical scale for data confidentiality.

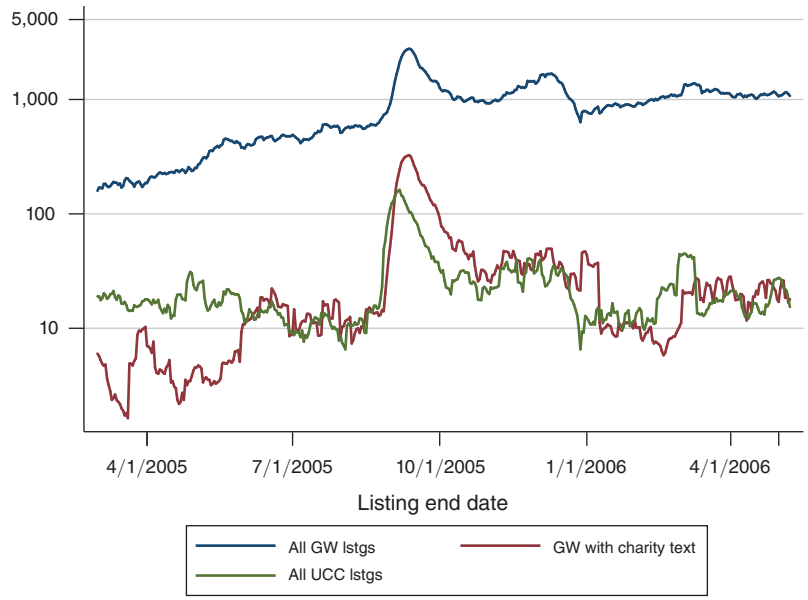


FIGURE 1. LISTINGS PER DAY FOR UCC, GW, AND GW WITH CHARITY TEXT

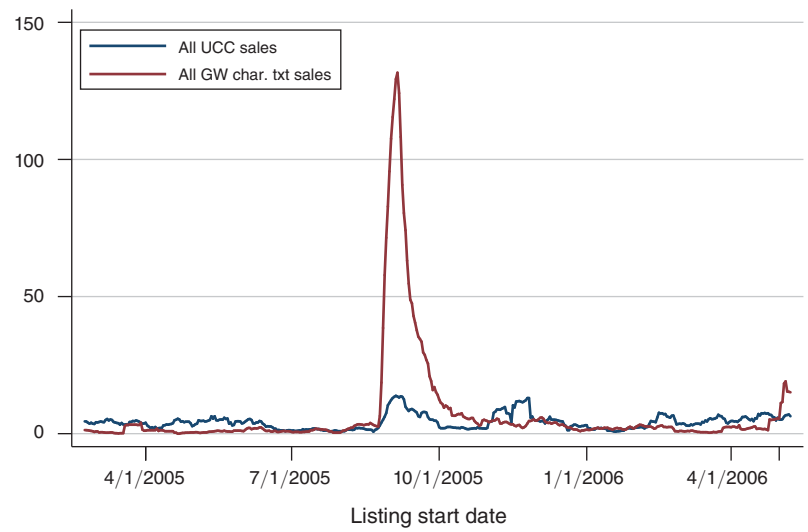


FIGURE 2. TOTAL SALES PER DAY FOR UCC AND GW WITH CHARITY TEXT

We conclude our overview of the data by describing the sellers and buyers associated with listings in our descriptive sample. While a few sellers posted many UCC listings during our period of investigation, a much larger number engaged in this practice only once or twice. In Table 3, we report, averaged over listings, seller effective percent positive feedback (EPP), feedback score, percentage positive

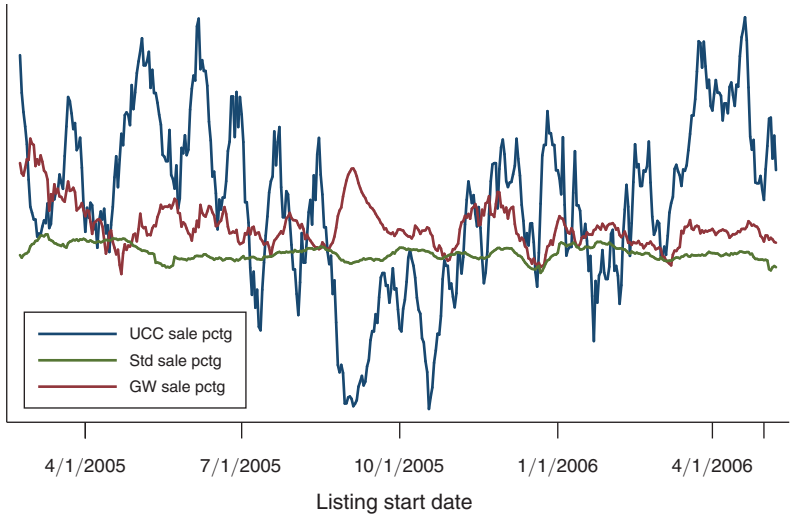


Figure 3. Sale Probabilities of GW and UCC Listings

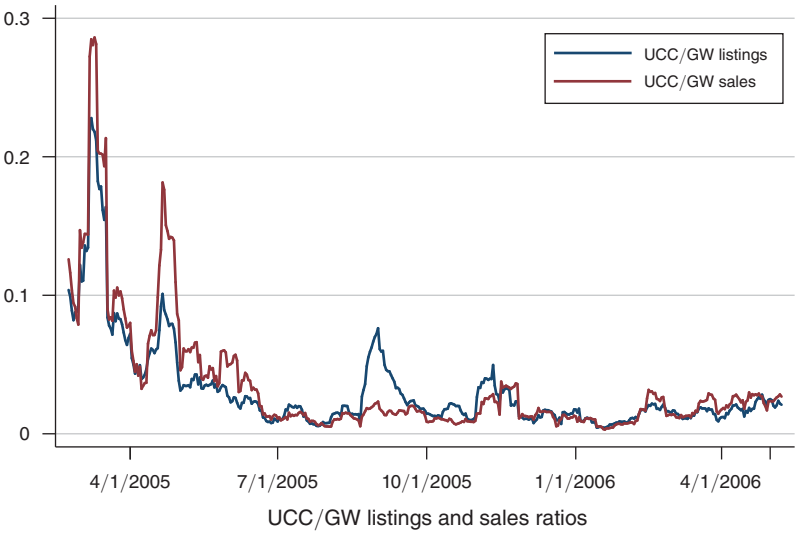


Figure 4. UCC-to-GW Ratios

feedback overall and divided into a few discrete categories, and age. We report statistics for the full set of sellers (who largely come from the platform-wide random sample) and separately for those who ever offer a UCC or GW listing. Some notable differences emerge across the groups. The mean and median EPP scores for UCC sellers are below those of the full seller population and those of the GW sellers. GW sellers have relatively low feedback scores and have been active on eBay for less time, indicating less experience for GW sellers, on average, relative to the remaining

Table 3—Seller Characteristics

| Sellers included | All | Ever UCC | Ever GW |
|---|---|---|---|
| Effective percent positive (EPP) | 75.16 | 71.93 | 73.68 |
| | 78.56 | 76.79 | 78.57 |
| Feedback positive percent | 0.98 | 0.98 | 0.98 |
| | 1.00 | 1.00 | 1.00 |
| Positive feedback 100% | 0.41 | 0.46 | 0.56 |
| | 0.00 | 0.00 | 1.00 |
| Pos. feedback [0.99, 1) | 0.28 | 0.21 | 0.16 |
| | 0.00 | 0.00 | 0.00 |
| Pos. feedback [0.98, 0.99) | 0.11 | 0.09 | 0.06 |
| | 0.00 | 0.00 | 0.00 |
| Pos. feedback $< 0.98$ | 0.16 | 0.17 | 0.11 |
| | 0.00 | 0.00 | 0.00 |
| Feedback score | 1,137.06 | 784.91 | 523.76 |
| | 262.00 | 154.75 | 80.60 |
| Seller age (days) | 1,253.32 | 1,238.99 | 1,200.39 |
| | 1,183.00 | 1,148.53 | 1,137.89 |
| Observations | 448,569 | 2,433 | 22,936 |

*Notes:* Each cell displays mean (top) and median (bottom) values. *Effective percent positive* is the fraction of transactions in the two years preceding a listing for which the seller received a positive rating, averaged at the seller level. *Positive feedback 100%* denotes sellers for whom 100 percent of ratings are positive. The other positive feedback variables similarly denote sellers in other feedback ranges based on the fraction of feedback received that is positive. *Feedback score* is the sum of a seller's positive ratings minus the sum of its negative ratings. *Seller age* is the number of days since a seller first listed an item on eBay. See text for further details.

population. UCC sellers, by contrast, have higher feedback scores and have been on the site for longer than both the GW sellers and those from the platform-wide random sample, which suggests that their use of charity claims is unlikely to be due to ignorance of the verified GW system.[21]

The distribution of percent positive feedback is very similar between UCC sellers and the full population, while GW sellers are more likely to have 100 percent positive feedback and less likely to have a positive feedback share in the lowest category (below 98 percent). Some users received no feedback as sellers during the rolling two-year window we use for these data, so the positive feedback share categories do not sum to one. Empty records are most common for GW sellers. We explore the differences in seller characteristics in a regression framework in the next section.

In Table 4, we compare the attributes of buyers who purchase UCC items, GW items, or items with no charity association. Buyers who purchase UCC-listed items are slightly "younger" than buyers who purchase GW items, but the UCC buyers have greater mean and median feedback scores than GW buyers. (As with sellers, age and feedback measures are highly correlated with each other.) A natural

[21] A small number (377) of UCC sellers also use GW during the sample period. For these sellers, 40 percent of their UCC listings were posted on dates strictly after their first GW posting, while 48 percent of their UCC listings were posted on strictly earlier dates. This suggests that exposure to the GW system had little effect in curtailing cheap talk by UCC sellers.

Table 4—Buyer Characteristics

| Buyers included | All (1) | Ever UCC (2) | Ever GW (3) | UCC during Katrina pd (4) |
|---|---|---|---|---|
| Age | 1,096.20 | 1,110.95 | 1,165.32 | 1,094.56 |
| | 987.50 | 1,003.00 | 1,077.00 | 970.00 |
| Feedback | 237.51 | 282.44 | 275.88 | 232.63 |
| | 51.00 | 56.00 | 62.00 | 47.00 |
| Observations | 807,871 | 2,381 | 101,943 | 607 |

*Notes:* Each cell displays mean (top) and median (bottom) values. Column 1 provides summary data for all buyers in our sample. Column 2 provides summary data for buyers who, at some point during our sample period, purchased an item with an unverifiable charity claim (UCC), and column 3 provides summary data for buyers who, at some point, purchased an item with a verifiable charitable contribution via Giving Works (GW) associated with it. Column 4 is the subsample of buyers from column 2 who made UCC purchases during the months following Hurricane Katrina's landfall (August 29–November 15, 2005). *Age* is the time in days since the buyer first purchased an item on eBay, and *Feedback* is the sum of positive ratings minus the sum of negative ratings received by a buyer. See text for details.

explanation for these differences in experience is that UCC listings (and to a lesser degree GW listings) are relatively rare. Thus, a buyer who engages in more transactions—and hence has a higher feedback score—is more likely to have encountered a UCC listing. The final column of Table 4 does, however, indicate that buyers of UCC items during the Katrina period were somewhat less experienced than buyers of UCC items overall. That said, we see no strong evidence in the present sample that UCC buyers taken as a whole are substantially less experienced than those who purchase GW items.

## III. Empirical Analysis

We estimate a series of regression models to assess the impact of UCC status and other charity-related activity on eBay listing outcomes. Throughout our analysis, we regress a collection of outcome measures (e.g., whether an item sells, the full price at which it sells) on a large collection of listing characteristics; we use $y$ to denote the outcome of interest. We collect listing characteristics relevant for UCC status in the vector $U$ and GW characteristics in $G$. We collect all other observable listings attributes in the matrix $X$. These include the log of starting price; the log of shipping fees plus 0.01; individual dummies for the number of pictures; dummies for the number of units available; indicators for the length and ending day of the week; and a dummy variable, $b$, for each week in the sample period. In our main analysis, we include a separate fixed effect, $a$, for each combination of seller and leaf category in the analysis sample. We account for additional listing-level unobserved factors with the error term $e$, which we cluster at the seller level. Finally, we use $i$ to index individual listings, $j$ to index seller-category combinations, and $t$ to index the week the listing ended. We thus estimate a collection of models that have the form

$$y_i = \Upsilon U_i + \Gamma G_i + \Theta X_i + a_j + b_t + e_i. \tag{1}$$

We estimate (1) as a linear regression model. While this involves some mis-specification given the discrete nature of $y$ in some cases, the approach allows us to include a large set of controls in the model, including about 70,000 distinct values of $a_j$.

Our estimates of the effect of UCC and GW listing status may still be biased if unobserved quality is correlated with a seller's propensity to create a UCC or GW listing (after conditioning on start price and other listing choices). We will return to this point at the end of Section IIIA, where we probe the robustness of our results to such concerns.

### A. *Baseline Effects of UCC and GW Status*

In Table 5, we investigate the relationship between UCC/GW status and auction-listing sales probability and price. In the main tables, we report only the coefficients of primary interest. Results on the complete set of control variables are included in online Appendix Table A2.

In specification 1, we include the full set of listing-level controls, as well as seller-category fixed effects to account for potential nonrandom selection of charity-related listings by seller and leaf category. Echoing previous results of Elfenbein and McManus (2010) and Elfenbein, Fisman, and McManus (2012), we find a large and positive relationship between GW and sales probability. Within a seller-category group, a GW donation is associated with an increase in sales probability of 7 percentage points.[22] We find a further benefit of charity text in a listing title for GW listings: a GW listing that also includes charity text has a sales probability that is 13 percentage points greater than a listing with no charity link. This suggests a complementarity between charity claims in the title and a mechanism that establishes the credibility of the claims.

We find a sharply contrasting relationship between sales probability and the use of charity text when not accompanied by a verifiable donation: the coefficient on UCC is $-0.126$ (significant at the 1 percent level), implying that UCC listings are almost 30 percent less likely to sell than listings with no link to charity at all. The results on control covariates (i.e., on the impact of $X$), reported in online Appendix Table A2, imply that objects are more likely to sell if they have a lower start price, have more photos, or have a longer scheduled length.

In specification 2, motivated by the patterns observed in Figures 1–4, we allow the effects of GW and UCC to vary with time. In particular, we interact all three charity variables (GW without charity text, UCC, and GW with charity text) with an indicator variable for listings posted during the Katrina period (the direct effect of Katrina is absorbed by the time fixed effects, $b_t$). We find that the lower sales probability for UCC listings is present only during the Katrina period, when UCC is associated with a reduction in sales probability of 31 percentage points. In non-Katrina months, there is a relatively small (positive) and statistically insignificant relationship between UCC and sales probability. Turning to the role of GW, we find that the improvement in sales probability associated with GW is greater during the Katrina

[22] For simplicity in this analysis, we do not disaggregate GW observations by their donation share. These results are provided in online Appendix Table A3.

Table 5—Effects of UCC and GW on Auction-Listing Outcomes

| Dependent variable<br>Specification | Sold<br>(1) | Sold<br>(2) | log(*Price* + *Ship fee*)<br>(3) | log(*Price* + *Ship fee*)<br>(4) |
|---|---|---|---|---|
| UCC listing | −0.126 | 0.0337 | 0.0806 | 0.0586 |
| | (0.0295) | (0.0363) | (0.0316) | (0.0378) |
| UCC listing × Katrina pd. | | −0.305 | | 0.0777 |
| | | (0.0529) | | (0.0550) |
| GW w/o charity text | 0.0730 | 0.0564 | 0.0620 | 0.0441 |
| | (0.00524) | (0.00619) | (0.0101) | (0.0129) |
| GW w/o charity text × Katrina pd. | | 0.0359 | | 0.0396 |
| | | (0.00719) | | (0.0123) |
| GW w/charity text | 0.130 | 0.0380 | 0.191 | 0.151 |
| | (0.0199) | (0.0353) | (0.0232) | (0.0477) |
| GW w/charity text × Katrina pd. | | 0.128 | | 0.0594 |
| | | (0.0340) | | (0.0449) |
| Observations | 1,813,385 | 1,813,385 | 827,756 | 827,756 |
| $R^2$ | 0.253 | 0.253 | 0.875 | 0.875 |

*Notes:* Each column presents the results of OLS estimation with both seller-category and weekly fixed effects and the covariates listed in online Appendix Table A2 as controls. The dependent variable in the first two columns is an indicator variable denoting whether an auction listing was sold. The dependent variable in the second two columns is the log of the final sales price plus the listed shipping fee, defined only for listings that sold. *UCC listing* denotes that the title of the listing makes an unverified charity claim. *GW listing w/o charity text* denotes that the listing has associated with it a verified charitable contribution made via eBay's Giving Works program, but no mention of the charitable contribution in the listing's title. *GW w/charity text* denotes that a listing both has charity-related text in its title and also a verifiable Giving Works donation associated with it. *Katrina pd.* denotes listings initiated during the months following Hurricane Katrina's landfall (August 29–November 15, 2005). Robust standard errors, clustered by seller, are in parentheses.

period. We also find that the complementarity between charity text and GW certification is far stronger during the Katrina period. At other times, the positive relationship between sales probability and GW without charity text is slightly higher than GW with charity text, though the difference is not statistically significant.

We next turn to study the relationship between charity listings and auction prices, conditional on a sale taking place, using the logarithm of the sales price plus shipping fee conditional on a transaction occurring, log(*Price* + *Ship fee*), as the outcome variable.[23] In specification 3, we find a positive relationship between GW and price, of a magnitude roughly in line with the results reported in Elfenbein, Fisman, and McManus (2012), which uses a larger dataset and more powerful matched-listing identification to estimate the impact of charity. Intriguingly, despite the negative relationship between UCC and sales probability, we find that successful UCC auctions have prices that are 8 percent greater ($p < 0.05$) than non-UCC non-GW listings. We interpret this result as consistent with naïve UCC buyers taking sellers' charity claims at face value and thus being willing to pay a premium similar to what other consumers pay for GW items.

In specification 4, we include the interactions of the three charity variables with a Katrina period dummy. We find that sold UCC items attracted a 14 percent price

[23] We omit the shipping fee from $X$ when the dependent variable is log(*Price* + *Ship fee*).

premium following Katrina (significant at the 1 percent level), while outside of the Katrina period UCC sale prices were insignificantly different from those of non-charity control items.[24] For GW, we find similar patterns to those we observe for sales probability: the benefits associated with GW are nearly twice as high during the Katrina period.

In online Appendix Table A4, we provide results on fixed-price listings, which are less numerous than true auctions in our analysis sample. The coefficient signs and sizes of many are roughly comparable to those in specifications 1 and 2, although our estimates have less precision, particularly for GW listings.

As noted above, our estimates of the effect of GW and UCC on sales probability and price may be biased if, say, sellers list superior (inferior) items as GW (UCC). In additional analysis, we take two approaches to mitigating these concerns. First, we limit the sample to listings for which sellers have entered a SKU number that, in theory, links the listing to a very specific product type; this eliminates products such as collectibles, artwork, memorabilia, event tickets, and other "unique" product from the sample. Sellers entered SKU numbers for about 20 percent of the listings in our sample. We use the SKU values to create seller-category-SKU fixed effects to better capture product attributes. We include these fixed effects in results we present in online Appendix Table A5. These results, which parallel those in Table 5, echo our primary findings interest: UCC listings are less likely to sell than their non-charity counterparts, and this penalty is much more pronounced during the Katrina period. We also find that GW listings are more likely to sell than non-charity listings in this subsample, though the difference in this sales probability premium is only slightly higher in the Katrina period, and the difference is not significant.

A separate approach to assessing the possibly confounding effect of unobserved quality is based on the assumption that start price is a good proxy of the seller's assessment of the product's "market value." If, as we add controls, the effect of start price on sales probability and/or sales price shifts considerably, we may worry that there are other unobservable quality attributes that we are not capturing, in the spirit of Altonji et al. (2005). We present results in online Appendix Table A6 that parallel those presented in columns 2 and 4 of Table 5, but vary the control variables included. First, we include only the log of start price as a control. When we add seller-category fixed effects, the coefficient on log start price changes substantially. However, the inclusion of the full battery of controls in the third set of results leaves the coefficient on log start price virtually unchanged. Thus, to the extent that log start price captures a seller's assessment of a good's market value, its stability as we add controls to our analyses suggests that there may be few unobserved quality differences left once we control for seller and category.[25] While the results in

[24] When we estimate this model with log(*Price*) as the dependent variable and include shipping fees in $X$, we find a similar premium for UCC items during the Katrina period.

[25] A related concern is that there may be time-varying shifts in the quality of UCC and/or GW listings. Again, presuming that start price is a rough proxy for quality, in online Appendix Table A7 we examine the determinants of start prices. Our main interest is whether, for UCC and GW listings, start prices shift systematically during the Katrina period. As reflected by the insignificant interaction terms in online Appendix Table A7, we do not observe any evidence of a systematic shift in start prices after controlling for seller-category fixed effects.

Tables A5 and A6 do not rule out the potentially confounding effects of unobserved quality, we believe they somewhat mitigate these concerns.

To summarize our results thus far, the sales probabilities and prices of listings with unverified charity claims are statistically indistinguishable from non-charity listings throughout most of our sample. Notably, however, UCC sales probabilities decline markedly in the weeks following Hurricane Katrina—exactly the period when demand for (and supply of) legitimate charity listings increases (as evidenced by the simultaneous increase in the price, sales probability, and volume of GW listings). One plausible interpretation of this finding is that "most" consumers take cheap talk about product attributes as a negative signal. This is consistent with the relatively modest quantity of UCC listings in our sample overall, and the fact that, despite a large increase in the supply of UCC listings in the Katrina period, the number of completed transactions increased by only a small amount.

### B. *Attributes of UCC and GW Sellers*

The different sales probabilities associated with verified versus unverified charity listings raise the question of whether buyers' choices are consistent with differences in seller or product attributes across UCC and GW sellers. In earlier work (Elfenbein, Fisman, and McManus 2012), we showed that GW-intensive sellers are less likely to generate unresolved customer disputes. While data for this outcome are unavailable in the period we study, we examine whether other measures of seller quality correlate with a seller's use of charity-linked listings. To do so, we revisit the patterns in Table 3, exploring them in a regression framework.

We perform the analysis first at the seller level, focusing on the approximately 22,000 sellers who are in the descriptive sample and offer either a UCC or GW listing. For each seller in this sample, we create an indicator variable for whether the seller offered one or more UCC listings (*Ever UCC*) and a second variable for the seller's frequency of UCC (*Percent UCC*) within the full descriptive sample. By omitting the sellers who never use GW or UCC, we avoid swamping this analysis with over 400,000 sellers who have shown no interest in engaging with consumers interested in charity donations. In addition to this seller-level analysis, we examine whether seller characteristics predict whether individual listings in the analysis sample are UCC or GW. This allows us to introduce product-category fixed effects, which can account for cross-category differences in GW and UCC frequency.

We report our seller-level analysis in specifications 1 and 2 of Table 6 using Probit and Tobit models, respectively, to estimate the correlation between seller UCC use and seller characteristics.[26] As an additional control for differences in charity-related practices across seller sizes, we also include the log of the seller's total number of listings in the descriptive sample. Our results are consistent with an overall lower level of quality for UCC sellers relative to GW sellers. We find that sellers with greater EPP values are less likely to post UCC listings at all (specification 1) and also devote a smaller share of their listings to UCC (specification 2).

[26] We can use Probit and Tobit models in this analysis because we do not include a large number of fixed effects.

Table 6—Analysis of Seller Characteristics

| Sample used | Descriptive | Descriptive | Analysis | Analysis |
|---|---|---|---|---|
| Level of analysis | Seller | Seller | Listing | Listing |
| Sellers included | UCC or GW | UCC or GW | All | All |
| Dependent variable | Ever UCC | Percent UCC | Listing UCC? | Listing GW? |
| Model | Probit | Tobit | OLS | OLS |
| Specification | (1) | (2) | (3) | (4) |
| Effective Percent Positive (EPP) | −0.00436 | −0.00386 | −1.88e−05 | 0.000118 |
| | (0.000777) | (0.000670) | (3.02e−05) | (0.000384) |
| Feedback positive = 100% | −0.204 | −0.163 | −0.00213 | 0.0448 |
| | (0.0373) | (0.0323) | (0.00117) | (0.0148) |
| Feedback positive = 99% | −0.0810 | −0.0711 | −0.00311 | 0.0241 |
| | (0.0454) | (0.0397) | (0.00108) | (0.0174) |
| Feedback positive = 98% | −0.000537 | 0.000163 | −0.000671 | 0.0792 |
| | (0.0535) | (0.0467) | (0.00156) | (0.0203) |
| No feedback received | −0.467 | −0.375 | −0.00225 | 0.0581 |
| | (0.107) | (0.0902) | (0.00404) | (0.0407) |
| log(Feedback) | 0.116 | 0.0963 | −0.000304 | −0.0129 |
| | (0.00964) | (0.00846) | (0.000240) | (0.00265) |
| log(Age) | −0.0938 | −0.0767 | 0.000211 | −0.0139 |
| | (0.0146) | (0.0127) | (0.000430) | (0.00780) |
| log(listings desc. samp.) | −0.0881 | −0.113 | | |
| | (0.00772) | (0.00699) | | |
| Fixed-price listing | | | −0.00290 | −0.0341 |
| | | | (0.000717) | (0.00864) |
| Observations | 21,702 | 21,702 | 1,967,851 | 1,967,851 |
| | | | 0.058 | 0.219 |

*Notes: Effective Percent Positive* (*EPP*) is the fraction of transactions in the two years preceding a listing for which the seller received a positive rating, averaged at the seller level. *Feedback positive = 100%* denotes sellers for whom 100 percent of ratings are positive. The other positive feedback variables similarly denote sellers in other feedback ranges based on the fraction of feedback received that is positive. The feedback score is the sum of a seller's positive ratings minus the sum of its negative ratings. The seller age is the number of days since a seller first listed an item on eBay. The seller's total number of listings in the descriptive sample is reported in "listings desc. samp." All included independent variables are shown for specifications 1 and 2. Specifications 3 and 4 also include an indicator for whether a listing is a fixed price, plus the full set of observable listing characteristics provided in online Appendix Table A2. Specifications 3 and 4 also include fixed effects for each leaf category plus a dummy for each week in the sample period. Standard errors are in parentheses.

The results in specification 1 imply that a one standard deviation (22.0) increase in a seller's EPP score above the mean reduces the probability of a UCC listing by 13 percent. Differences across UCC and GW sellers are also apparent in these users' shares of positive feedback. Relative to sellers with percent positive feedback below 98 percent (the omitted category), sellers who post UCC listings are less likely than GW sellers to have percent positive scores in any higher category. This difference is statistically significant and largest in magnitude for 100 percent positive ratings.

We conclude the seller-focused analysis by investigating whether individual listings' UCC or GW status is predicted by sellers' characteristics, while controlling for GW and UCC frequency by product category. We use the full analysis sample (and all sellers, including the control group) for these listing-level models and in doing so allow seller frequency within the sample to provide an ad hoc weighting on which sellers' characteristics have a greater impact on the dependent variable.

We report the results of our listing-level analysis in Table 6, specifications 3 and 4. Each specification is a linear regression of a listing's UCC or GW status on: the same seller characteristics discussed above, the same set of listing-level characteristics included in Table 5's analysis (provided in full in Table A2), a dummy variable for whether a listing is fixed-price rather than true auction, and a collection of 11,000 leaf category fixed effects. We cluster standard errors by seller. We find that sellers' EPP scores are not significantly correlated with the probability that a listing has UCC $= 1$. However, sellers with 99 percent positive feedback or greater are significantly less likely to offer a UCC listing. We test for the joint significance of the (uniformly negative) coefficients on EPP and the positive feedback categories, and we find that the coefficients are significantly different from zero at $p < 0.06$. In specification 4, we consider the probability that a listing has GW status, and we find that sellers' EPP scores and positive feedback measures are positively correlated with the likelihood of offering a verified charity donation; the coefficients on 100 percent and 98–99 percent positive feedback are significantly different from zero. A joint test of the EPP and percent positive feedback coefficients reveal that they are significantly different from zero at $p = 0.001$. These findings suggest that buyer response to UCC listings are consistent with the lower quality of sellers who tend to post such listings.[27]

## IV. Conclusions

We provide empirical evidence on consumer responses to cheap talk claims and the sellers who make such claims. Despite the importance of policy bodies such as the FTC's Bureau of Consumer Protection, field evidence is rare on potentially deceptive claims by firms. While we find that some naïve consumers are drawn to products with unverified claims, in our eBay setting the evidence suggests that the number of naïve consumers is largely invariant to the extent of cheap talk. On the supply side, sellers are quick to adjust their perceptions about consumer receptiveness to cheap talk—when Hurricane Kartina hit, sellers began making a larger number of unverified charity claims, but when consumers did not move strongly toward these listings, sellers moved rapidly away from them (see, in particular, Figure 4). The evidence we provide also suggests that the majority of buyers draw a neutral to slightly negative view of sellers who make unverified claims. In our setting, this view is warranted, as sellers making unverified claims receive lower rates of positive feedback than their counterparts who make verified charity claims, or no charity claims at all.

One intriguing implication of our research is that, in many markets, the existence of a legitimate and verifiable mechanism for informing buyers of product attributes may be effective in limiting cheap talk. While eBay began policing unverifiable charity claims more rigorously in recent years, our Katrina-era findings suggest that it may not have been necessary: the existence of a verifiable charity mechanism may have severely limited the scope for charity cheap talk. Although this observation

[27] Similarly, GW listings may sell with greater probability at least in part because verifiable charity listings serve as a positive signal of trustworthiness, as suggested by Elfenbein, Fisman, and McManus (2012).

may limit the generalizability of our findings, it also highlights an important market design insight derived from our analysis.

## Data Appendix

To identify listings with strong language about charitable donations, we flagged all listings that satisfied one or more of the following conditions in the listing title or subtitle:

- Contains the term "charity auction" or "charity listing."
- Contains the term "benefit auction" or "benefit listing."
- Contains the phrase "will be donated," "profit goes to," "profits go to," "revenue goes to," "winning bid goes to," or "proceeds to charity."
- Contains the term "Katrina," "hurricane," "New Orleans," or "Red Cross" plus one or more of the word stems "donat," "benefit," or "charit."

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