Consumer Choice and Corporate Bankruptcy*

Preliminary and incomplete, comments welcome

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Abstract: Using an incentivized randomized experiment, we estimate the causal effect of a Chapter 11 bankruptcy filing on consumer demand for the bankrupt firm's products. Knowledge of Hertz's Chapter 11 bankruptcy reduces consumers' willingness-to-pay for Hertz by 35%. We show evidence that consumers fear both (i) a liquidation preventing future relationships with a firm and (ii) a decline in quality while a firm reorganizes. Estimating a structural model of consumer demand, we quantify the large negative impact of Hertz's bankruptcy on Hertz's market share and consumer welfare. We find that educating consumers about Chapter 11 can improve consumer welfare.

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1 Introduction

Firms rely extensively on debt financing. While debt has many benefits, value can be destroyed when lenders worry that they will not be repaid. For example, a firm at risk of liquidating may lose customers who derive utility from future interactions with a stable business. Likewise, a firm may be perceived as having low quality if it is reorganizing in Chapter 11 bankruptcy, deterring consumers. Fearing this consumer response, distressed firms may avoid an otherwise beneficial Chapter 11 reorganization to prevent such a loss of customers. While these indirect costs of bankruptcy have been studied for decades, they are notoriously difficult to quantify. In this paper, we use an incentivized experiment involving the May 22, 2020 Chapter 11 filing of Hertz Corporation[1] to estimate the causal effect of corporate bankruptcy on consumer demand for a bankrupt firm's products. We find that learning about a Chapter 11 bankruptcy filing causally reduces a consumer's willingness to pay for the bankrupt firm's products by an estimated 35%.

We consider two reasons why consumers might care about a corporate bankruptcy. First, consumers might value future interactions with a firm (e.g. warranties, brand loyalty, switching costs). Second, consumers might worry that a firm reduces its quality during bankruptcy to conserve cash (e.g. firing employees, reducing inventory). We find evidence for both hypotheses. First, we show that educating consumers about bankrupt firms' survival rates causally reduces consumer aversion to bankrupt firms. This implies that consumers avoid bankrupt firms because they value ongoing relationships with firms. Second, we find that willingness to pay for a bankrupt firm's products is strongly correlated with consumers' concerns about the firm's quality during bankruptcy. Exploring the mechanisms behind the experiment participants' choices, we find that participants worry about the maintenance of rental car vehicles and the availability of inventory while a firm is in bankruptcy.

The negative consumer response to corporate bankruptcies that we document harms both bankrupt firms, which lose market share, and consumers, who may have previously derived surplus from a bankrupt firm's products. To quantify these losses, we use our experiment to estimate a structural model. Using the model, we explore the following counterfactual: what if Hertz had not entered Chapter 11 bankruptcy? We find that Hertz's bankruptcy caused a significant decline in both Hertz's market share and consumer welfare. We also show that

[1] See https://restructuring.primeclerk.com/hertz/Home-Index.

this decline can be mitigated by educating consumers about the potential for Chapter 11 to rehabilitate firms.

Measuring the effect of bankruptcy on consumer demand is difficult because of an omitted-variable problem: Unobservable adverse economic shocks can cause both a firm's bankruptcy filing and a reduction in consumer demand for the firm's products. To isolate the decline in demand caused by a firm entering bankruptcy, we need an estimate of what demand would have been had the same firm not entered bankruptcy. We form such an estimate by fixing a specific bankrupt firm and comparing consumers that are aware of the bankruptcy to those that are not. An additional challenge arises from the fact that consumer awareness of a given bankruptcy might be correlated with consumer preferences. We address this challenge using a randomized experiment in which we vary the information that consumers receive about a firm and its bankruptcy status. This approach also allows us to understand the mechanisms by which bankruptcy affects consumer decision making.

Our experiment measures the extent to which consumers care about a firm's bankruptcy status when making their purchase decisions. The experiment measures consumer's willingness to pay for a Hertz gift card. By randomly disclosing Hertz's bankruptcy status to consumers, some of whom were previously unaware of the bankruptcy, we estimate the causal effect of Hertz's bankruptcy on consumer preferences. Hertz is an attractive firm to study because consumers may worry about poor inventory, undermaintenance of cars, and a loss of reward points when contemplating renting a car from a bankrupt company. Additionally, Hertz was bankrupt at the time of our experiments, allowing us to offer actual money to spend at Hertz during the bankruptcy. Since our representative-US-adult participants were incentivized by the possibility of receiving actual money at Hertz, these experimental results may plausibly be extrapolated to real-world settings.

We find that consumers lower their willingness to pay for Hertz (relative to Enterprise) by 35% upon learning that Hertz is in bankruptcy. However, this decline in consumer demand is significantly dampened when consumers learn that firms similar to Hertz have historically survived bankruptcy. Interestingly, informing consumers that Hertz received debtor-in-possession (DIP) financing has no effect on willingness to pay. Further, we show that many consumers worry about the extent to which bankrupt firms maintain inventory and assets. We show that consumers who are strongly concerned that bankrupt firms reduce inventory are less willing to pay for a bankrupt firm's products.

Our reduced-form results show that consumers are less willing to pay for a firm's products if that firm is bankrupt. To quantify the impact of a firm's bankruptcy on its market share and consumer welfare, we estimate a model of consumer demand. Using this structural model, we consider the counterfactual world in which consumers do not learn of Hertz's bankruptcy. We find that Hertz's bankruptcy decreased Hertz's market share by 12% and consumer welfare in the rental-car market by 20%.

Finally, we use our estimated model to evaluate a second counterfactual: How would the consequences of a Chapter 11 bankruptcy filing change if consumers better understood the bankruptcy process? To answer this question, we reestimate our model using a treatment group in which we inform consumers of the survival of previous car-rental companies after bankruptcy. We calculate that if consumers better understood the survival prospects of bankrupt firms, Hertz's market-share loss would have been 13% smaller and consumers' welfare loss would have been 10% smaller.

In the next section, we relate our work to the current literature. We explain our experimental design in Section 2. In Section 3, we describe the results of our experiment. In Section 4, we explore the reasons why consumers care about corporate bankruptcies. In Section 5, we introduce a model of consumer demand, which we estimate with our experimental data to study counterfactual scenarios. We provide concluding remarks in Section 6.

1.1 Contribution to the Literature

This paper's main contributions to the literature are the following findings: (i) a Chapter 11 bankruptcy filing causes a dramatic decline in consumer demand for the bankrupt firm's products; (ii) the large consumer welfare loss caused by a corporate bankruptcy filing can be mitigated by consumer education; and (iii) the decline in consumer demand is due to both concerns about a firm's quality during bankruptcy and concerns that a firm may not exist in the future.

In earlier work, Hortaçsu, Matvos, Syverson, and Venkataraman (2013) and Hortaçsu, Matvos, Shin, Syverson, and Venkataraman (2011) find that used-car-auction prices for a particular vehicle decline when the vehicle's manufacturer approaches bankruptcy. The authors hypothesize that professional automobile dealers who participate in these auctions are less willing to pay for vehicles from a manufacturer that will not honor warranties or replace

parts in the event of liquidation. We complement these studies by showing in a randomized controlled experiment that nonprofessional consumers (i) are aware of bankruptcy filings associated with businesses that they patronize and (ii) are far less willing to pay for goods of bankrupt firms. We also complement these studies by providing direct evidence on the mechanisms by which corporate bankruptcy reduces consumer demand. Finally, we contribute by demonstrating that these indirect financial distress costs may be mitigated by educating consumers about the ability of Chapter 11 bankruptcy to rehabilitate insolvent firms.

In the marketing literature, Ozturk, Chintagunta, and Venkataraman (2019) find that the bankruptcy of one firm can have negative spillover effects on the firm's competitors because consumers worry that the firm's financial distress may be representative of the entire industry. Phillips and Sertsios (2013) explore how product quality and pricing vary with the financial distress of a firm. Using data from the airline industry, the authors find that while quality declines during times of financial distress, it actually improves when a firm enters bankruptcy. The authors hypothesize that a bankrupt firm might improve quality to revitalize its customer base in order to convince a bankruptcy judge that a reorganization is feasible. Prices, on the other hand, decline in financial distress and even further during bankruptcy. Malshe and Agarwal (2015) quantify how advertising and R&D funding changes when a firm is highly leveraged. While consumer satisfaction declines with an increase in leverage, advertising and R&D funding can moderate the effect. Mainardes, Mota, and Moreira (2020) explore correlations between how bankruptcy changes a firm's reputation and consumers' trust for the bankrupt firm. We contribute by measuring and exogenously varying consumer awareness of corporate bankruptcies to estimate the causal effect of bankruptcy on consumer demand. Additionally, we contribute by showing how educating consumers, both about a firm's financial status and about what bankruptcy entails, changes consumer decision-making. To the best of our knowledge, we are the first paper to experimentally manipulate what a consumer knows about bankruptcy.

Methodologically, our paper relates to Exley (2016), who precedes this work in using a price list to estimate consumer valuations. This work also relates more broadly to the literature exploring the relationship between firm reputation and consumer demand (Burke, Dowling, and Wei (2018), Dodds, Monroe, and Grewal (1991)) as well as the literature on how financial distress affects firms' product quality (Matsa, 2011).

2 Experimental Design

2.1 Experiment Motivation

Our experiment aims to measure the causal effect of a Chapter 11 bankruptcy filing on consumer demand for the bankrupt firm's products. The ideal experiment for this purpose would measure consumer demand for both a solvent firm A and a firm B that is bankrupt but otherwise identical to firm A. Comparing consumer demand for firm A to demand for firm B would identify the desired causal effect. However, this ideal experiment is infeasible because bankrupt firms are inherently different from solvent firms. We overcome this challenge with an experimental design that considers demand for a single bankrupt firm B and compares consumers that are aware of the bankruptcy to consumers that are unaware.[2]

Our experiment addresses concerns that unobservable firm characteristics might affect both a firm's bankruptcy status and demand for its products. However, our comparison across consumers faces a different challenge: consumers that are aware of a given firm's bankruptcy might be different from those that are not. We overcome this problem by randomly informing treated consumers of firm B's bankruptcy. We also measure control participants' prior knowledge of firm B's bankruptcy. Our empirical analysis uses an intent-to-treat design in which the randomly assigned treatment produces exogenous variation in consumers' endogenous awareness of firm B's bankruptcy.

To ensure that we accurately measure demand for the bankrupt firm B's products, we provide incentives to participants. When choosing between a gift card specific to firm B and an outside option, participants know that they have a chance of receiving their preferred option. To implement this incentivized approach, we need a specific bankrupt firm for our study. We use Hertz Corporation, which filed for Chapter 11 bankruptcy on May 22, 2020, as our representative bankrupt firm. Hertz was still in the bankruptcy process during the time-frame of our experiment (November - December 2020). Additionally, Hertz is a large and well-known company with a business model that is easy to understand. The outside option in our experiment is a gift card at Enterprise, a comparable firm that had never filed

[2]Our experimental design and subsequent analysis were preregistered with the American Economic Association RCT registry on November 23, 2020: https://doi.org/10.1257/rct.6406-1.1. This study has been approved by Boston College's Institutional Review Board (Protocol IRB: 21.078.01e-1) and by Harvard Business School's Institutional Review Board (Protocol IRB20-1634).

for bankruptcy as of December 2020. Consumers are thus incentivized to accurately report their willingness to pay for a bankrupt firm's products. Our experiment measures the causal effect of a consumer's awareness of a firm's bankruptcy on the consumer's willingness to pay for the bankrupt firm's products.

2.2 Experiment Details

We now provide a detailed description of our experiment, which involves five stages. First, participants are asked a series of questions that serve as an attention check and help guise the experimental goal. Those that pass the attention checks move on to the second stage. Participants are presented with a price list following Exley (2016). In a series of questions, participants are asked if they would prefer a \$50 gift card at Hertz or a gift card at Enterprise. For each participant, we vary the value of the Enterprise gift card in \$5 increments starting at \$0 and ending at \$95. This price list reveals each participant's willingness to pay in "Enterprise dollars" for \$50 at Hertz. To incentivize participants to accurately report their preferences, 1% of participants are randomly selected to receive one of their preferred gift cards from the price list, selected at random. Participants are informed of this lottery before making their selections. As indicated in the preregistration for our experiment, we drop participants that indicate non-monotonic preferences: a preference for \$Y dollars at Enterprise over \$50 at Hertz and a preference for \$50 at Hertz over \$Y' > \$Y at Enterprise. We also follow our preregistered design by dropping participants that prefer a \$0 gift card at Enterprise to \$50 at Hertz.

While all participants complete the same price list in the second stage, we randomize the information that accompanies the price list. Immediately before completing the price list, participants are randomized into one of four groups. One third of participants are assigned to the control group. Control participants are presented with the price list and told they must choose between Hertz and Enterprise, which are car rental companies. In the second group, participants are informed that Hertz is in Chapter 11 bankruptcy. One third of participants are assigned to this group, which we refer to this as the basic treatment group.

In the third and fourth groups, participants are educated about Chapter 11 when they are informed that Hertz is in Chapter 11 bankruptcy. When informed of Hertz's bankruptcy, the third group of participants is shown the following text: "Alamo Rent A Car, Budget,

and National Car Rental all filed for bankruptcy in 2001 and 2002. All three are still in business today." We refer to this third group as the survival treatment group. When the fourth group of participants is informed of Hertz's bankruptcy, the participants are also shown the following description of Hertz's DIP financing loan: "While in bankruptcy, Hertz obtained a $1.65 billion loan to 'support the Company as it moves through its next stage of its Chapter 11 process'"[3] We refer to this fourth group as the DIP treatment group. The third of participants not assigned to either control or basic treatment are evenly split between the third and fourth groups. We summarize this information in Table 1.

In the third stage of our experiment, all participants are presented with a list of well-known firms and asked which firms are currently bankrupt. This allows us to identify participants in the control group that are aware of Hertz's bankruptcy. We also verify which treated participants retain the knowledge that Hertz is bankrupt. In our empirical analysis, the awareness of Hertz's bankruptcy that we measure in this third stage is instrumented by the randomized treatment status from the second stage of our experiment.

In the fourth stage, we ask questions to understand consumer perceptions about bankrupt firms. This helps to identify the mechanisms behind consumers' choices. We also ask participants what fraction of large public companies that seek to remain in business through bankruptcy reorganization succeed. Additionally, we ask how many times the participant has used Hertz and Enterprise in the past (0, 1-5 times, more than 6 times). Finally, in the fifth stage, we conclude by gathering demographic information about participants: age, gender, education, and income.

3 Reduced-Form Results

3.1 Data

We conduct our experiment to produce a dataset of participant responses and characteristics (e.g., treatment or control). Each observation in the dataset corresponds to a distinct experiment participant. For each participant i, our primary outcome variable is the participant's willingness to pay for a Hertz gift card. We measure this willingness to pay using the

[3] See https://www.news-press.com/story/money/companies/2020/10/16/hertz-has-secured-1-65-billion-new-financing-fights-its-way-out-bankruptcy/3676571001/.

price list in the second stage of the experiment. For each participant, we identify the largest value \$Y such that the participant prefers \$50 at Hertz to \$Y at Enterprise. We define the willingness-to-pay variable WTP_i to equal \$Y / \$50. The variable WTP_i is thus equal to participant i's willingness to pay, in Enterprise-gift-card dollars, for one Hertz-gift-card dollar. After applying the filters described in our preregistration (Section 2), we measure WTP_i for 1,238 participants.

Our primary independent variable is an indicator $Aware_i$ that is equal to one if participant i is aware of Hertz's bankruptcy. We consider a participant to be aware of the bankruptcy if she selects Hertz when, in stage three of the experiment, she is asked to indicate which firms are bankrupt (Section 2).

In our empirical analysis, we instrument for the endogenous variable $Aware_i$ using the randomly assigned treatment status of participant i. We define an indicator $Treat_i$ that is equal to one if the participant is in one of the three treatment groups: basic treatment, survival treatment, or DIP treatment. We also define indicators $Survival\ treat_i$ and $DIP\ treat_i$ that are equal to one if participant i is in the survival or DIP treatment groups, respectively.

In Table 2, we report summary statistics. Within the control group ($Treat_i = 0$), 26% of participants are aware of Hertz's bankruptcy. On average, control-group participants value Hertz and Enterprise equally, as shown by the mean of WTP_i. In the basic treatment group, 90% of participants are aware of Hertz's bankruptcy, confirming that most participants pay attention to the text in the second stage of the experiment. Among basic treatment-group participants, the average willingness to pay for a Hertz giftcard is 23% lower than the corresponding average among control participants. Participants in the DIP treatment and survival treatment groups also value Hertz less than control-group participants, but the difference is not as large.

The summary statistics in Table 2 suggest that exogenously informing participants of Hertz's bankruptcy makes those participants less willing to pay for Hertz's services. The summary statistics also suggest that educating consumers about DIP financing or Chapter 11 survival rates can lessen the impact of bankruptcy filings on consumer demand.

3.2 Two-Stage Least Squares Setup

Table 2 shows that the average willingness to pay for a Hertz giftcard is 23% lower in the treatment group than in the control group. This comparison of average willingness to pay underestimates the causal effect of Hertz's bankruptcy because some control-group participants knew of Hertz's bankruptcy before the experiment. To account for this, we use a two-stage least squares (2SLS) approach and estimate a local average treatment effect (LATE): the average causal effect of learning that Hertz is bankrupt among individuals that did not already know of the bankruptcy.

Our 2SLS approach requires an instrument that increases awareness of Hertz's bankruptcy (first-stage relevance) without otherwise impacting an individual's willingness to pay for Hertz (exclusion restriction). By construction, our randomly assigned experimental treatment is likely to meet these criteria.

In this context, the exclusion restriction requires that informing participants of Hertz's bankruptcy does not affect a participant's willingness to pay for Hertz other than through this information. Outside of our experiment, awareness of Hertz's bankruptcy might be correlated with unobservable consumer preferences. Indeed, in our structural estimation (Section 5.2), we find that consumers that prefer Hertz over competitors are more likely to be aware of Hertz's bankruptcy. However, given that our instrument is a randomly assigned treatment status in a controlled laboratory experiment, we believe that the exclusion restriction is likely to hold.

The first-stage relevance condition requires that the randomly assigned treatment status is correlated with awareness of Hertz's bankruptcy. To show that this condition is satisfied, we estimate the following equation by ordinary least squares (OLS):

$$Aware_i = \phi + \gamma\, Treat_i + \Pi X_i + \epsilon_i. \tag{1}$$

In equation (1), ϕ is an intercept, ϵ_i is an error term, and γ is the cofficient on the treatment status $Treat_i$. In some specifications, we also estimate coefficients Π on a vector X_i of control variables. For control variables, we include: (i) an indicator equal to one if participant i has previously patronized Hertz; (ii) an indicator equal to one if participant i has previously patronized Enterprise; (iii) an indicator variable that is equal to one if the participant is male; (iv) the participant's age, proxied by a series of indicator variables

that are equal to one if the age is in a particular interval (e.g., 35-44 years old); (v) the participant's income, proxied by a series of indicator variables that are equal to one if the income is in a particular interval (e.g., $50,000 to $74,999); and (vi) a series of indicator variables for different education levels (e.g., high-school graduate). In all of our analysis, we use robust standard errors to account for heteroskedasticity.

We present the results of estimating equation (1) in Table 3. Column 1 shows the results of a regression with no control variables estimated in our full sample. Unsurprisingly, we find that informing participants of Hertz's bankruptcy dramatically increases the likelihood that a participant is aware of Hertz's bankruptcy — by 64 percentage points. The F-statistic on the instrument, $Treat_i$, is 747. Column 2 confirms that this result is robust to the inclusion of the control variables in X_i. The sample size declines slightly because some participants do not respond to all demographics questions. Columns 3 and 4 confirm that our results are robust to excluding the DIP treatment group and survival treatment group.

3.3 Two-Stage Least Squares Results

Next, we evaluate the causal effect of bankruptcy awareness on consumers' willingness to pay. By comparing consumers that are aware of Hertz's bankruptcy to those that are not, we hold fixed any omitted variables related to the bankrupt firm. However, it could be that consumers who are aware of Hertz's bankruptcy are unobservably different from those that are not. To overcome this omitted variables problem, we use a two-stage least squares (2SLS) approach. In the first stage, we instrument for bankruptcy awareness with the exogenous treatment status. In the second stage, we evaluate the impact of the instrumented bankruptcy-awareness value on willingness to pay.

Specifically, we estimate the following equation by 2SLS:

$$WTP_i = \phi + \gamma \widehat{Aware}_i + \Pi X_i + \epsilon_i. \tag{2}$$

In this equation, $\widehat{Aware}_i$ is the fitted value of $Aware_i$ from equation (1). The dependent variable is participant i's willingness to pay for Hertz (Section 3.1). The other variables and coefficients are defined analogously to equation (1). The results are displayed in Table 4. Column 5 shows the results of a 2SLS regression estimated using the control group and basic treatment group. The LATE of learning that Hertz is bankrupt is a $0.36 reduction

in willingness to pay for a Hertz-gift-card dollar. Column 6 shows that this is robust to the inclusion of control variables. Individuals with prior experience with Hertz are more willing to pay for Hertz. Individuals with prior experience at Enterprise are less willing to pay (in Enterprise-gift-card dollars) for Hertz.

Column 4 shows the results of estimating equation (2) by OLS, using actual values of $Aware_i$ rather than instrumented values. We find that the correlation between awareness of Hertz's bankruptcy and willingness to pay for Hertz is smaller in magnitude than the LATE of learning that Hertz is bankrupt. This suggests that omitted variables such as financial sophistication might be correlated with both bankruptcy awareness and preferences for Hertz. The smaller magnitude for the negative OLS coefficient suggests that individuals who are endogenously aware of Hertz's bankruptcy have a higher willingness to pay for Hertz. We confirm in our structural estimation (Section 5.2) that tastes for Hertz are correlated with knowledge of Hertz's bankruptcy.

Columns 1-3 display the results of the same regressions using a different estimation sample: one that includes the DIP treatment group and survival treatment group. Including these groups, we find a LATE that is smaller in magnitude. This suggests that educating individuals about DIP financing and Chapter 11 survival prospects can mitigate consumer reactions to bankruptcy announcements. We explore this further in the following section.

4 Why Do Consumers Care about Bankruptcy?

Our 2SLS estimation shows that a Chapter 11 bankruptcy filing substantially reduces consumers' willingness to pay for the bankrupt firm's products. We consider two possible explanations for this result. First, consumers might believe that firms lower the quality of their products during bankruptcy. Consumers that are less willing to pay for low quality products may thus be less interested in bankrupt firms. We refer to this explanation as the *current quality hypothesis*. Second, consumers might be more willing to pay for a firm's products when they expect a future relationship with the firm. For example, a consumer might be less willing to pay for a firm's products if she believes that firm will liquidate, forcing her to switch to a new product. We refer to this second explanation as the *future interactions hypothesis*.

In Section 4.1, we examine the causal effects of additional treatments. These results

provide evidence for the future interactions hypothesis. In Section 4.2, we quantify consumer perceptions of bankrupt firms using survey questions from our experiment. These results provide evidence for the current quality hypothesis.

4.1 Additional Treatment Groups

We test the future interactions hypothesis by randomly treating consumers with additional information about bankruptcy. Intuitively, if consumers dislike bankrupt firms because they value future interactions with a firm, then consumer aversion to bankrupt firms should depend on consumer perceptions of bankruptcy survival rates. We change these perceptions for randomly selected consumers and measure the impact on preferences.

Recall that participants in the basic treatment group are informed only that Hertz is bankrupt. Participants that are randomly selected to be in the survival treatment group are similarly told that Hertz is bankrupt. However, the survival treatment group is also told that firms similar to Hertz have survived Chapter 11 (Table 1). Relative to other participants, survival group participants are thus likely to believe that bankrupt firm survival rates in this industry are high.

The survival treatment group corresponds to a hypothetical policy intervention: What if consumers were educated about Chapter 11 survival prospects? In practice, consumers may change their perceptions about a particular bankrupt firm's survival prospects after news coverage of a major development in a bankruptcy. For example, consumers might feel more confident that a firm will reorganize after learning that it obtained DIP financing. To approximate these real-world changes in consumer perceptions, we randomly inform participants in the DIP treatment group of the DIP loan that Hertz obtained during bankruptcy. Table 1 shows the exact information provided.

To evaluate the effects of these different treatments, we estimate the following equation by OLS:

$$WTP_i = \phi + \gamma_1 Treat_i + \gamma_1 DIP\ treat_i + \gamma_3 Survival\ treat_i + \Pi X_i + \epsilon_i. \tag{3}$$

We present the results in Table 5. Consistent with Table 4, we find that the causal effect of the randomly assigned treatment is a dramatic reduction in willingness to pay. Consumers lower their demand for Hertz after learning that Hertz is bankrupt. Interestingly,

the coefficient on *Survival treat*$_i$ is positive and statistically significant. The magnitude of the coefficient ranges from 0.071 to 0.079 depending on the specification. This magnitude is roughly one third of the magnitude of the coefficient on *Treat*$_i$. This implies that educating consumers about the survival prospects of bankrupt firms eliminates roughly one third of the effect of bankruptcy on consumer demand.

Perhaps surprisingly, we find that the coefficient on *DIP treat*$_i$ is statistically insignificant. At least in the context of Hertz, DIP financing does not encourage consumers to patronize a bankrupt firm.

We interpret these results as providing evidence for the future interactions hypothesis. It appears that consumers care about future interactions with a bankrupt firm because their preferences depend on their perceptions of bankrupt firm survival prospects. Nonetheless, educating consumers about bankrupt firm survival rates only reduces the impact of a bankruptcy by one third. This suggests that the future interactions hypothesis does not entirely explain our 2SLS estimate (Table 4).

4.2 Additional Results on Mechanisms

Customers might avoid bankrupt firms for a variety of reasons. Some might view bankruptcy as evidence of an inferior product. Others might believe key employees or trade vendors will leave the company, lowering its quality. Additionally, consumers may believe that product warranties or return policies will not be honored by a firm in Chapter 11 bankruptcy. Alternatively, consumers might increase their demand for a bankrupt firm as they might believe that they are likely to get a fire-sale bargain.

To further understand how consumers make decisions when faced with a bankrupt firm, we ask participants general questions about their perceptions of bankrupt firms. In the fourth stage of our experiment, we ask participants a series of questions of the format "On a scale of 1 to 7 how much do you agree with the following statement?" The statements are as follows: (i) "Companies go bankrupt because their product is inferior;" (ii) "Companies go bankrupt because they have engaged in fraudulent activities;" (iii) "Companies go bankrupt because their products are overpriced;" (iv) "Going bankrupt is synonymous with ceasing to operate;" (v) "Companies that go bankrupt have sale prices that reflect a greater bargain;" (vi) "I worry that the cars will not be maintained well at a bankrupt car rental company;"

and (vii) "I worry that bankrupt companies have limited inventory."

We present histograms of participant responses in Figure 1. We present summary statistics in Table 6. Given that participants answer on a scale from one to seven, a response of four may be interpreted as neutral. For three of the questions, the average participant response is significantly larger than four, indicating that consumers agree with those statements. We find that consumers believe that bankrupt firms will not maintain their rental cars properly and might have limited inventory. However, consumers also believe that there will be discounted prices at bankrupt firms. These results provide some insight into why consumers might value a bankrupt firm less than a solvent firm. In particular, the results support the current quality hypothesis because participants strongly believe that firms change behavior *during* bankruptcy. Interestingly, the results do not suggest that participants view bankruptcy as a signal that a firm has always had poor quality.

Participants' perceptions of bankrupt firms are consistent with the current quality hypothesis. To test the extent to which these quality perceptions drive our results, we estimate the following equation by OLS:

$$WTP_i = \phi + \sum_{m=1}^{7} \gamma_m Question\ m\ response_i + \Pi X_i + \epsilon_i. \tag{4}$$

In equation (4), we regress participants' willingness to pay on participants' numeric responses to the seven questions described above (Table 6 and Figure 1). We present results in Table 7. Within the full sample, responses to several questions are correlated with willingness to pay. These correlations could be spurious: consumers with specific bankruptcy perceptions might share a particular taste for Hertz even if Hertz were not bankrupt. To alleviate this concern, we estimate equation (4) using only individuals that are aware of Hertz's bankruptcy. The results, displayed in columns 3 and 4, suggest a story consistent with Table 6. Consumers are less willing to pay for a bankrupt firm's products if they believe bankrupt firms have poor inventory and undermaintain their assets. This is consistent with the current quality hypothesis. Consumers have higher demand for Hertz if they believe that bankrupt firms offer bargain prices. Importantly, the results in Table 4 are not causal. However, they suggest that our results might be driven by consumers' fears that a bankrupt firm will lower its quality.

To summarize, our reduced-form results suggest that a Chapter 11 bankruptcy filing

causally reduces consumer demand for the bankrupt firm's products. This effect appears to be driven by consumers' concerns that bankrupt firms will both (i) not continue operating; and (ii) have limited inventory and, in the context of rental-car companies, not properly maintain their vehicles.

5 Model and Estimation

Our reduced-form results show that consumers are less willing to pay for a firm's products if that firm is bankrupt. In this section, we estimate a model of consumer demand to quantify the impact of a firm's bankruptcy on the firm's market share and consumer welfare. Section 5.1 describes our simple model of consumer choice, which is a simplified version of the model in Hortaçsu et al. (2011). Section 5.2 describes the model estimation. Section 5.3 describes counterfactuals.

5.1 Model

We model a collection of consumers, indexed by i, choosing whether to purchase a good from a bankrupt firm (i.e., Hertz). Some consumers are aware that the firm is bankrupt while others are not. As in Section 3, we let $Aware_i$ denote an indicator that is equal to one if consumer i is aware of the bankruptcy. Consumer i's utility u_i from purchasing the bankrupt firm's good depends on her awareness $Aware_i$:

$$u_i = \delta + \alpha p + \beta Aware_i + \epsilon_i. \tag{5}$$

In this equation, ϵ_i is a random taste shock that may be correlated with $Aware_i$. The intercept δ captures the average preference for the good. We let p denote the price of the bankrupt firm's good relative to the price of an equivalent good sold by some solvent competitor. In a typical demand estimation, the econometrician observes decisions to purchase zero goods (or some other outside option), which identifies consumer sensitivity to absolute prices. In our experiment, all consumers choose either Hertz or Enterprise, so we identify a relative-price-sensitivity parameter α. While this formulation is slightly nonstandard, it allows us to directly map the model to the willingness to pay that we estimate in our experiment. We normalize the consumer's utility from not purchasing the bankrupt firm's good

(i.e., choosing Enterprise) to equal zero. The consumer thus purchases the bankrupt firm's good if and only if $u_i > 0$.

We assume that if consumer i is aware of the firm's bankruptcy ($Aware_i = 1$), this changes her utility for the bankrupt firm's good by a parameter β. This specification allows for the possibility that consumers have a taste or distaste for bankrupt firms. We model the indicator $Aware_i$ as an indicator that is equal to one if and only if a continuous latent variable is positive:

$$Aware_i = \mathbf{1}\left(\mu + \xi\, Treat_i + \nu_i > 0 \right). \tag{6}$$

In this equation, the latent variable is the sum of a model parameter μ, a random shock ν_i, and a parameter ξ times an instrument $Treat_i$ that is independent of (ϵ_i, ν_i). The parameter μ determines the fraction of the general population that is aware of the bankruptcy. In our estimation, $Treat_i$ is an indicator equal to one if consumer i is randomly selected to be informed of the bankruptcy. The parameter ξ captures the impact of the instrument on consumer i's awareness of the bankruptcy. This specification allows for the possibility that some consumers know the firm is bankrupt ($Aware_i = 1$) even when they are not informed in the experiment ($Treat_i = 0$).

We assume that the two shocks ϵ_i, ν_i are standard normal random variables with correlation ρ. We use our experiment to estimate the parameter vector:

$$\Theta \equiv \{\mu, \xi, \delta, \alpha, \beta, \rho\}. \tag{7}$$

5.2 Estimation

We estimate the model of Section 5.1 using our experimental dataset containing choices between Hertz and Enterprise. For each observation i, we define the extended-real-valued bounds:

$$\mathbb{B}_i^{low} \equiv Aware_i \left(-\mu - \xi\, Treat_i \right) - (1 - Aware_i) \times \infty \tag{8}$$

$$\mathbb{B}_i^{up} \equiv (1 - Aware_i) \left(-\mu - \xi\, Treat_i \right) + Aware_i \times \infty. \tag{9}$$

It follows immediately from equation (6) that $Aware_i = 1$, almost surely, if and only if $\nu_i \in [\mathbb{B}_i^{low}, \mathbb{B}_i^{up}]$. Note that observing $Aware_i = 1$ reveals a lower bound on ν_i but not an upper bound (equation (6)). Likewise, observing $Aware_i = 0$ reveals an upper bound on ν_i but not a lower bound.

Let WTP_i denote customer i's willingness to pay, in Enterprise dollars, for one Hertz dollar. Our experiment dataset provides a discretized measure of WTP_i for each participant. Since consumer i prefers one Hertz dollar to WTP_i Enterprise dollars by definition of WTP_i,

$$\delta + \alpha\, WTP_i + \beta Aware_i + \epsilon_i > 0. \tag{10}$$

By definition of the willingness to pay, for any $\Delta > 0$, consumer i prefers $WTP_i + \Delta$ Enterprise dollars to one Hertz dollar:

$$\delta + \alpha(\, WTP_i + \Delta) + \beta Aware_i + \epsilon_i < 0. \tag{11}$$

Due to the nature of our experiment, our measure of WTP_i takes M discrete values $\{p^1, ..., p^M\}$. For any $k = 1, 2, ...M$, it follows from equations (10) and (11) that $WTP_i = p^k$, almost surely, if and only if ϵ_i lies between the following bounds:

$$\mathbb{K}_i^{p^k, low} = -\mathbf{1}\ (\ k > 1\ )\Big(\ \delta + \alpha p^k + \beta Aware_i\ \Big)\ -\mathbf{1}\ (\ k = 1\ )\times\infty \tag{12}$$

$$\mathbb{K}_i^{p^k, up} = -\mathbf{1}\ (\ k < M\ )\Big(\ \delta + \alpha p^{k+1} + \beta Aware_i\ \Big)\ +\mathbf{1}\ (\ k = M\ )\times\infty. \tag{13}$$

If consumer i chooses Hertz at the highest price in our price list ($WTP_i = p^M$) then we do not observe an upper bound for ϵ_i. Likewise, if consumer i never chooses Hertz, we do not observe a lower bound for ϵ_i. Given our assumptions, the probability of observing $Treat_i, Aware_i, WTP_i$ given the vector of parameters Θ is equal to the following expression:

$$\mathbb{P}_\rho\left(\ \nu_i \in [\mathbb{B}_i^{low}\ ,\ \mathbb{B}_i^{up}]\ \wedge\ \epsilon_i \in [\mathbb{K}_i^{WTP_i, low}\ ,\ \mathbb{K}_i^{WTP_i, up}]\ \right), \tag{14}$$

where $\mathbb{P}_\rho$ is the measure generated by two standard normal random variables ν_i, ϵ_i with correlation ρ. We estimate the vector of parameters Θ to maximize the log likelihood of the data:

$$\Theta_{MLE} \equiv \text{argmax}_{\Theta} \sum_{i=1}^{N} \log \left[\mathbb{P}_{\rho} \left(\nu_i \in [\mathbb{B}_i^{low}, \mathbb{B}_i^{up}] \wedge \epsilon_i \in [\mathbb{K}_i^{WTP_i,low}, \mathbb{K}_i^{WTP_i,up}] \right) \right]. \quad (15)$$

To begin, we estimate Θ_{MLE} by equation (15) using only the control group and the basic treatment group: participants who are informed only that Hertz is bankrupt. Table 8 presents the results. Our estimate of μ implies that $\Phi(\mu) = 26\%$ of the general population is aware of Hertz's bankruptcy, where $\Phi(\cdot)$ denotes the standard normal cumulative distribution function, consistent with Table 2. Our negative estimate of α confirms that consumers are sensitive to the relative prices of Hertz and Enterprise. Our estimate of δ is larger in magnitude than our estimate of α. This implies that, absent Hertz's bankruptcy, the average consumer's utility for purchasing from Hertz is higher than the average consumer's utility from an equivalently priced purchase at Enterprise.

Our estimate of β is negative and statistically significant. We describe the economic significance of this estimate in the following section. As expected, our estimate for ξ is very large and positive: consumers are far more likely to be aware of Hertz's bankruptcy when we inform them of Hertz's bankruptcy. More surprisingly, we estimate that ρ is positive and statistically different from zero. This implies that consumers with a strong taste for Hertz (high ϵ_i) are more likely to endogenously discover that Hertz is bankrupt (high ν_i). This result suggests that consumers are more cognizant of corporate bankruptcies among firms that they frequently patronize.

5.3 Counterfactuals

In this section, we use the estimated model to evaluate a counterfactual scenario: what if consumers were unaware of Hertz's bankruptcy?[4] Using the model estimates in Table 8, we simulate 100,000 independent draws from the joint distribution of ν_i, ϵ_i. Assuming consumer i is not exogenously informed of Hertz's bankruptcy, she is endogenously aware of the bankruptcy if

[4]Since our goal is to estimate the impact of consumer perceptions of corporate bankruptcy, we are agnostic in this counterfactual as to whether (i) Hertz is financially sound or (ii) Hertz is bankrupt but no one knows this.

$$Aware_i^{sim} \equiv \mathbf{1}\ (\ \mu + \nu_i > 0\ ) = 1 \tag{16}$$

and she chooses Hertz over Enterprise at a relative price p if and only if

$$u_i^{sim} \equiv \delta + \alpha p + \beta Aware_i^{sim} + \epsilon_i > 0. \tag{17}$$

Using the simulated values ν_i, ϵ_i, we calculate Hertz's model-implied market share as

$$Hertz\ share^{sim} \equiv \frac{1}{100,000} \sum_{i=1}^{100,000} \mathbf{1}\left(u_i^{sim} > 0 \right). \tag{18}$$

Likewise, we calculate the model-implied consumer welfare as

$$Consumer\ welfare^{sim} \equiv \frac{1}{100,000} \sum_{i=1}^{100,000} \max\left(u_i^{sim}, 0 \right). \tag{19}$$

Next, we calculate what Hertz's market share and consumer welfare would have been if no consumers were aware of Hertz's bankruptcy. Put differently, what if the 26% of consumers that knew of Hertz's bankruptcy without our interference (Table 2) had instead not found out about the bankruptcy? For our purposes of estimating the effect of consumer perceptions, it is irrelevant in this exercise whether Hertz were financially sound or whether Hertz kept its bankruptcy completely secret. To evaluate this counterfactual scenario, we use the same (ν_i, ϵ_i) draws to calculate

$$Hertz\ share^{counter} \equiv \frac{1}{100,000} \sum_{i=1}^{100,000} \mathbf{1}\left(\delta + \alpha p + \epsilon_i > 0 \right) \tag{20}$$

$$Consumer\ welfare^{counter} \equiv \frac{1}{100,000} \sum_{i=1}^{100,000} \max\left(\delta + \alpha p + \epsilon_i, 0 \right). \tag{21}$$

These definitions are equivalent to equations (18) and (19) except that D_i^{sim} is fixed at zero. To compare these quantities, we assume that $p = 1$: Hertz and Enterprise price goods equivalently.

Using this approach, we find that Hertz's bankruptcy had a dramatic effect on its mar-

ket share. Calculating the ratio of $Hertz\ share^{sim}$ to $Hertz\ share^{counter}$, we find that Hertz's bankruptcy reduced its market share by 12%. Many consumers that would have preferred Hertz, absent its bankruptcy, instead chose Enterprise. Importantly, this counterfactual fixes $Treat_i = 0$, so this effect is solely driven by consumers that were not prompted by our experiment to learn that Hertz is bankrupt. In addition to the disutility of consumers switching away from their preferred firm, many consumers that stuck with Hertz in spite of its bankruptcy derived less surplus from its services. Because of these two effects, Hertz's bankruptcy reduced consumer welfare by 20%, as measured by the ratio of $Consumer\ welfare^{sim}$ to $Consumer\ welfare^{counter}$.

Finally, we estimate that the impact of Hertz's bankruptcy would have been smaller if consumers were better educated about Chapter 11. To show this, we estimate our model by the procedure described in Section 5.2 using a different sample: control participants and participants informed of both (i) Hertz's bankruptcy and (ii) the survival of Alamo Rent A Car, Budget, and National Car Rental. By comparing individuals randomly assigned to these two groups, we estimate the effect of learning that Hertz is bankrupt for consumers who understand that many firms survive bankruptcy. This leads to a different estimate of β, which reflects consumer aversion to bankrupt firms after learning that many bankrupt firm recover. Using this new estimate of β, we reestimate equations (18)-(21). The impact of Hertz's bankruptcy on its market share would have been 13% smaller if consumers had understood the ability of Chapter 11 to rehabilitate bankrupt firms. Additionally, the impact of Hertz's bankruptcy on educated consumer welfare is 10% smaller than the overall effect on consumer welfare.

6 Conclusion

In this paper, we demonstrate that consumers value a firm that is in bankruptcy less than a similar firm that is not. Quantifying the difference in valuation, we find that consumers reduce their willingness to pay for Hertz's products by 35% after learning that Hertz is bankrupt. This effect is statistically and economically significant. We find that this effect is moderated by consumers' experience with the bankrupt firm in the past. It is also moderated by informing consumers that comparable companies have emerged from bankruptcy in the past. Surprisingly, informing consumers that the bankrupt firm has secured financing has no

effect. We further find that consumers believe that while bankrupt firms might have sales that provide good bargains, consumers are also concerned that bankrupt firms might not properly maintain key assets and may have limited inventory.

We also develop a model of consumer choice between bankrupt and solvent firms. We find that bankruptcy reduces a firm's market share and reduces consumer welfare. These losses can be mitigated if consumers are educated about the ability of Chapter 11 to rehabilitate financially distressed firms.

These results have important managerial implications and lessons for bankrupt firms and firms considering filing for Chapter 11 bankruptcy. By educating consumers about what bankruptcy means for a firm and its probability of survival, managers can diminish the negative effects of bankruptcy on consumer-facing firms. Such education can thus make Chapter 11 a more viable option for financially distressed firms.

Our results have additional marketing implications. Previous research shows that switching costs between brands are substantial and play an important role in consumer decision making (Klemperer, 1995). If consumers switch away from a firm because of its bankruptcy status, the firm may struggle to re-gain those customers. Such a permanent loss of customers could explain why many firms that emerge from bankruptcy perform poorly and subsequently refile for bankruptcy (Hotchkiss, 1995).

Our results also imply a role for policy intervention. If consumers stop shopping at a store that they fear might go out of business, this could accelerate the store's closure. Such a closure gives consumers fewer choices when shopping. Consumers deciding against shopping at a bankrupt firm can thus harm both the firm and future consumers. We directly show how regulators could alleviate this negative externality by educating consumers about Chapter 11.

A caveat to this work is that bankruptcy is not a proxy for financial distress. We only study firms that have chosen to utilize Chapter 11 bankruptcy. Additionally, while our results point to the fact that educating consumers can mitigate their concerns, it could also be that consumers are correct in lowering their willingness to pay for bankrupt firms. Many firms do not survive bankruptcy or exit with too much debt and subsequently refile. Nonetheless, given our estimates of how strongly consumers care about corporate bankruptcy, it is important to help consumers make decisions with accurate information about bankruptcy and the survival prospects of bankrupt firms.

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Table 1: Information provided to experiment participants

Immediately before completing the price list, experiment participants are randomly assigned to one of four groups: control, basic treatment, survival treatment, or DIP treatment. In this table, we show the information provided to participants in each of the four groups. In the third column, we list the proportion of experiment participants that we intended to assign to each group (before applying our preregistered filters).

Group	Information Displayed	Proportion
Control	Hertz and Enterprise are rental car companies.	1/3
Basic Treatment	Control + "Hertz filed for Chapter 11 bankruptcy on May 22, 2020. Hertz is still in bankruptcy."	1/3
Survival Treatment	Basic Treatment + "Alamo Rent A Car, Budget, and National Car Rental all filed for bankruptcy in 2001 and 2002. All three are still in business today."	1/6
DIP Treatment	Basic Treatment + "While in bankruptcy, Hertz obtained a $1.65 billion loan to 'support the Company as it moves through its next stage of its Chapter 11 process' (Hertz Newsroom)."	1/6

Table 2: Summary Statistics

This table displays summary statistics. For each participant, Aware is an indicator variable that is equal to one if the participant is aware of Hertz's bankruptcy. WTP is the participant's willingness to pay for Hertz defined in Section 3.1. We present summary statistics separately for the full sample, control group, basic treatment group, DIP treatment group, and survival treatment group (Section 2.2).

	Mean	SD	N
Full sample			
Aware	0.66	0.47	1,238
WTP	0.87	0.48	1,238
Control			
Aware	0.26	0.44	453
WTP	1.00	0.39	453
Basic treatment			
Aware	0.90	0.30	376
WTP	0.77	0.53	376
DIP treatment			
Aware	0.94	0.24	200
WTP	0.82	0.52	200
Survival treatment			
Aware	0.83	0.37	209
WTP	0.84	0.46	209

Table 3: First Stage

This table displays ordinary least squares estimates of our first-stage equation (1). The dependent variable, Aware, is an indicator variable that is equal to one if the participant is aware of Hertz's bankruptcy. Treat is an indicator that is equal to one if the participant is in one of the three treatment groups. Prior Hertz and Prior Enterprise are indicators that are equal to one if the participant previously purchased from Hertz or Enterprise, respectively. In the regressions associated with columns 2 and 4, we include: (i) an indicator variable that is equal to one if the participant is male; (ii) the participant's age, proxied by a series of indicator variables that are equal to one if the age is in a particular interval (e.g., 35-44 years old); (iii) the participant's income, proxied by a series of indicator variables that are equal to one if the income is in a particular interval (e.g., \$50,000 to \$74,999); and (iv) a series of indicator variables for different education levels (e.g., high-school graduate). Columns 3 and 4 exclude both the DIP treatment and survival treatment groups. We report robust standard errors in parentheses.

	Aware			
	(1)	(2)	(3)	(4)
Treat	0.637***	0.642***	0.646***	0.652***
	(0.023)	(0.023)	(0.026)	(0.026)
Prior Hertz		0.010		0.018
		(0.022)		(0.029)
Prior Enterprise		0.004		0.025
		(0.022)		(0.029)
Sample	Full	Full	Basic Treat	Basic Treat
Demographics FE	N	Y	N	Y
Observations	1238	1218	829	819
F-Statistic	746.9	750.2	633.2	645.5
Adj. R^2	0.419	0.427	0.416	0.419

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 4: Instrumental-Variables Regressions

This table displays two-stage least squares (2SLS) estimates of our instrumental-variables regression (2). The dependent variable, WTP, is the participant's willingness to pay for Hertz defined in Section 3.1. We instrument for the endogenous variable Aware, defined in Table 3, using an indicator that is equal to one if the participant is in one of the three treatment groups. Columns 2, 3, 5, and 6 display 2SLS estimates. Columns 1 and 4 show estimates from ordinary least squares (OLS) regressions in which we regress WTP directly on the endogenous variable Aware. See Table 3 for the other variable definitions and the demographic control variables. Columns 4-6 exclude both the DIP treatment and survival treatment groups. We report robust standard errors in parentheses.

	WTP					
	(1)	(2)	(3)	(4)	(5)	(6)
Aware	-0.211***	-0.310***	-0.301***	-0.223***	-0.355***	-0.353***
	(0.027)	(0.041)	(0.040)	(0.031)	(0.051)	(0.049)
Prior Hertz			0.186***			0.208***
			(0.030)			(0.035)
Prior Enterprise			-0.156***			-0.169***
			(0.031)			(0.038)
Estimator	OLS	IV	IV	OLS	IV	IV
Sample	Full	Full	Full	Basic Treat	Basic Treat	Basic Treat
Demographics FE	N	N	Y	N	N	Y
Observations	1238	1238	1218	829	829	819

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 5: Additional Treatments

This table displays ordinary least squares (OLS) estimates of equation (3), the effect of different treatments on willingness to pay. The dependent variable WTP is defined in Table 4. Treat is an indicator variable that is equal to one if the participant is in any of the three treatment groups. Survival treat and DIP treat are indicator variables equal to one if the participant is in the survival or DIP treatment groups, respectively. See Table 3 for the other variable definitions and the demographic control variables. We exclude the DIP treatment group in Column 1. We exclude the survival treatment group in Column 2. We report robust standard errors in parentheses.

	WTP			
	(1)	(2)	(3)	(4)
Treat	-0.229***	-0.229***	-0.229***	-0.227***
	(0.033)	(0.033)	(0.033)	(0.032)
Survival treat	0.071*		0.071*	0.079*
	(0.042)		(0.042)	(0.041)
DIP treat		0.050	0.050	0.051
		(0.046)	(0.046)	(0.045)
Prior Hertz				0.183***
				(0.030)
Prior Enterprise				-0.158***
				(0.031)
Estimator	OLS	OLS	OLS	OLS
Excluded Treatment	DIP	Survival	None	None
Demographics FE	N	N	N	Y
Observations	1038	1029	1238	1218
Adj. R^2	0.0471	0.0468	0.0396	0.0859

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 6: Mechanisms

This table presents the results of the fourth stage of our experiment. We ask participants a series of questions of the format "On a scale of 1 (not at all) to 7 (a great deal) how much do you agree with the following statement?" Each row presents summary statistics of numeric responses to a question of this form. Moving from the first row to the seventh row, the rows correspond to the following statements: (i) "Companies go bankrupt because their product is inferior;" (ii) "Companies go bankrupt because they have engaged in fraudulent activities;" (iii) "Companies go bankrupt because their products are overpriced;" (iv) "Going bankrupt is synonymous with ceasing to operate;" (v) "Companies that go bankrupt have sale prices that reflect a greater bargain;" (vi) "I worry that the cars will not be maintained well at a bankrupt car rental company;" (vii) "I worry that bankrupt companies have limited inventory." The table presents the averages and standard deviations of the responses. The third column is the p-value for a hypothesis test that the mean is greater than 4, which is a neutral response.

	Mean	SD	p-value for Mean > 4
Inferior product	3.16	1.66	1
Fraud	3.12	1.75	1
Overpriced	3.74	1.7	1
Cease to operate	3.51	1.86	1
Bargain prices	4.22	1.55	0
Maintenance	4.43	1.77	0
Inventory	4.51	1.67	0

Table 7: Mechanisms on WTP

This table displays ordinary least squares (OLS) estimates of equation (4), the associations between willingness to pay and perceptions about bankrupt firms. The dependent variable WTP is defined in Table 4. The seven listed variables correspond to numeric responses to seven questions of the format "On a scale of 1 (not at all) to 7 (a great deal) how much do you agree with the following statement?" Moving from the first row to the seventh row, the rows correspond to the following statements: (i) "Companies go bankrupt because their product is inferior;" (ii) "Companies go bankrupt because they have engaged in fraudulent activities;" (iii) "Companies go bankrupt because their products are overpriced;" (iv) "Going bankrupt is synonymous with ceasing to operate;" (v) "Companies that go bankrupt have sale prices that reflect a greater bargain;" (vi) "I worry that the cars will not be maintained well at a bankrupt car rental company;" (vii) "I worry that bankrupt companies have limited inventory." Columns 1 and 2 show results based on the full sample, while columns 3 and 4 show results based on a sample of participants that are aware of the bankruptcy ($Aware_i = 1$). Columns 2 and 4 include all of the control variables (including demographic variables) listed in Table 3. We report robust standard errors in parentheses.

	WTP			
	(1)	(2)	(3)	(4)
Maintenance	-0.018**	-0.013	-0.028**	-0.018
	(0.009)	(0.009)	(0.011)	(0.011)
Inventory	-0.022**	-0.023***	-0.038***	-0.038***
	(0.009)	(0.009)	(0.012)	(0.011)
Bargain prices	0.014	0.014	0.020*	0.017
	(0.009)	(0.009)	(0.012)	(0.012)
Cease to operate	0.015*	0.011	0.017	0.008
	(0.009)	(0.009)	(0.011)	(0.012)
Inferior product	0.022*	0.021*	0.015	0.007
	(0.011)	(0.012)	(0.015)	(0.016)
Fraud	0.019*	0.011	0.011	0.005
	(0.010)	(0.010)	(0.013)	(0.013)
Overpriced	0.007	0.005	0.011	0.010
	(0.010)	(0.010)	(0.013)	(0.013)
Sample	Full	Full	Aware	Aware
Controls FE	N	Y	N	Y
Observations	1238	1218	817	807
Adj. R^2	0.0261	0.0584	0.0259	0.0670

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 8: Model-Parameter Estimates

We estimate the model of Section 5 using our experimental data, according to the procedure described in Section 5.2. Column 1 shows maximum-likelihood estimates of the model parameters. Column 2 shows corresponding asymptotic standard errors.

Parameter	Estimate	Standard Error
	(1)	(2)
μ	-0.66	0.06
δ	2.20	0.08
α	-1.90	0.06
β	-0.74	0.11
ξ	1.93	0.11
ρ	0.26	0.08

Figure 1: Histograms of Question Responses

This figure plots histograms of the answers to the questions in the fourth stage of our experiment. See Table 6 for a description of these questions.

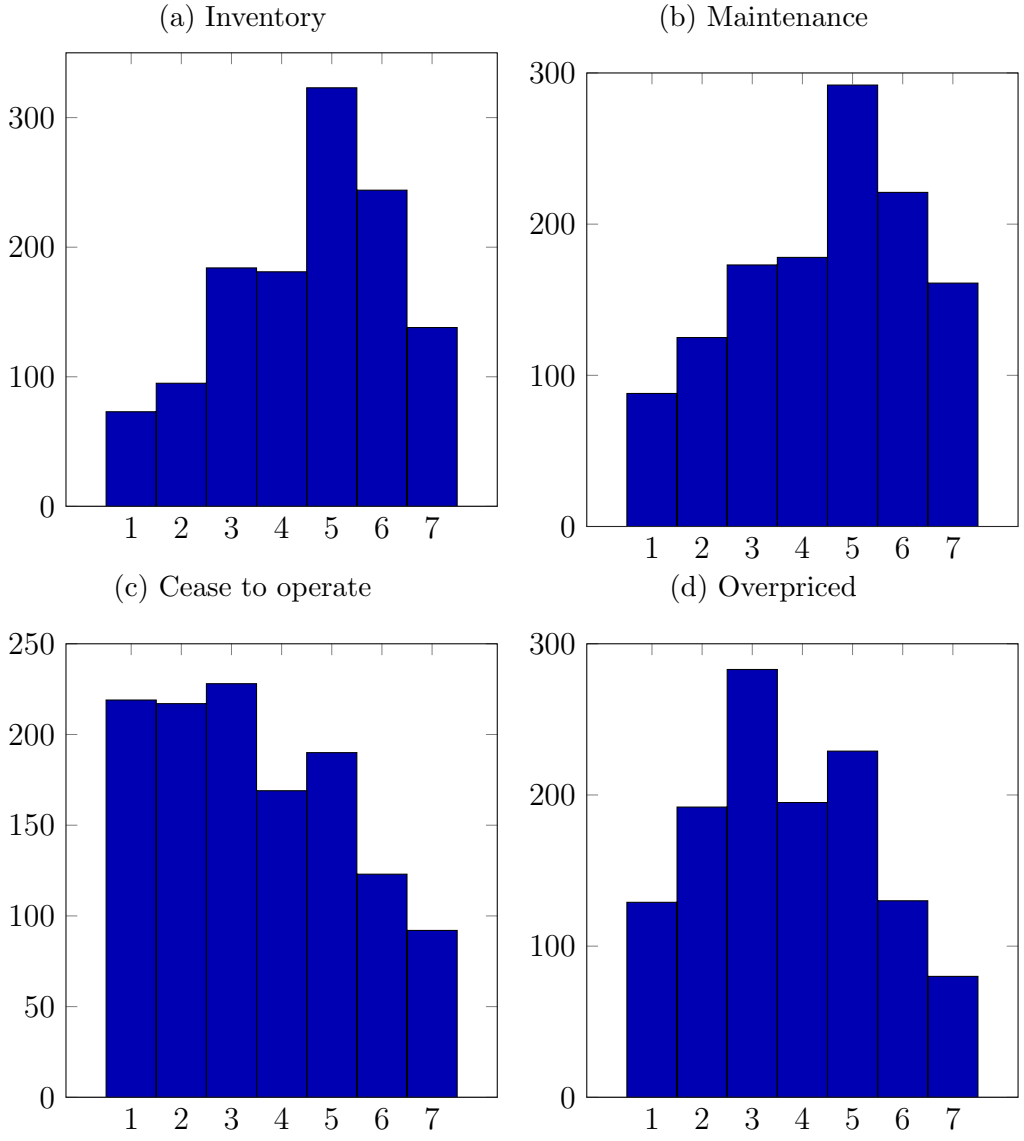
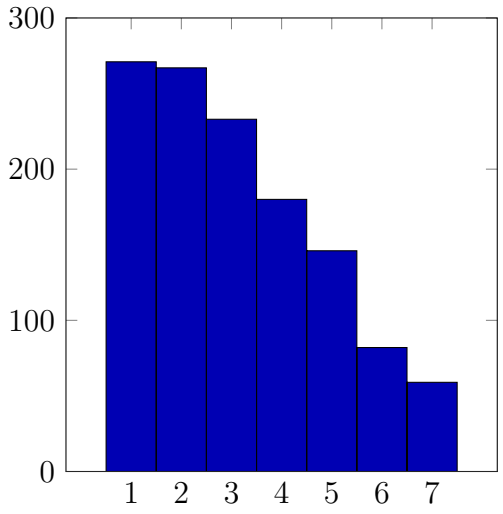


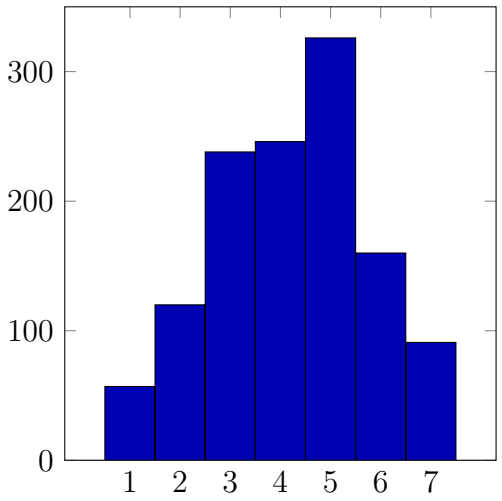
Figure 1: Histograms of Question Responses, continued

This figure plots histograms of the answers to the questions in the fourth stage of our experiment. See Table 6 for a description of these questions.

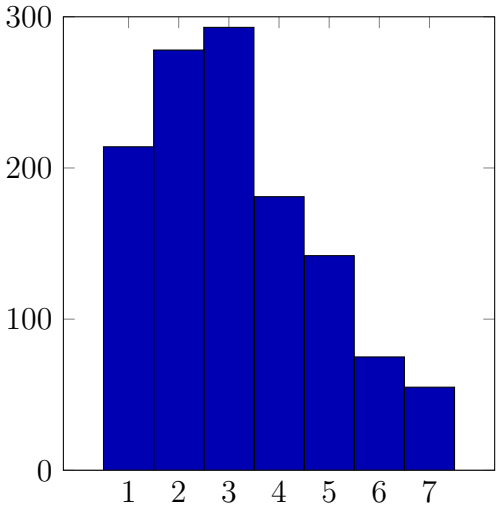
(a) Fraud



(b) Bargain prices



(c) Inferior product



A Unincentivized Experiment

The results presented in the main text are from an incentivized experiment. In order to be incentive compatible, participants were told that "You have a 1 in 100 chance of actually receiving one of your chosen gift cards." To see if the gift card was changing the results, we ran the same experiment but without the lottery incentive. Participants were only paid for their time. All of our results hold. The difference in willingness to pay upon finding out that Hertz is bankrupt is smaller than in the incentivized version, however it is still statistically significant (p-value < 0.01). The only significant difference is that in regressing the mechanisms on willingness to pay bargain prices and fraud became significant for the sub-sample of respondents who were aware of the Hertz bankruptcy.

Table A.1: Summary Statistics, Unincentivized Experiment

This table displays summary statistics based on data from our unincentivized experiment. For each participant, Aware is an indicator variable that is equal to one if the participant is aware of Hertz's bankruptcy. WTP is the participant's willingness to pay for Hertz defined in Section 3.1. We present summary statistics separately for the full sample, control group, basic treatment group, DIP treatment group, and survival treatment group (Section 2.2).

	Mean	SD	N
Full sample			
Aware	0.62	0.49	1,106
WTP	0.90	0.41	1,106
Control			
Aware	0.22	0.41	405
WTP	0.97	0.31	405
Basic treatment			
Aware	0.87	0.34	357
WTP	0.83	0.45	357
DIP treatment			
Aware	0.87	0.34	170
WTP	0.86	0.47	170
Survival treatment			
Aware	0.82	0.39	174
WTP	0.93	0.42	174

Table A.2: First Stage, Unincentivized Experiment

This table displays ordinary least squares estimates of our first-stage equation (1) using data from our unincentivized experiment. The independent variable, Aware, is an indicator variable that is equal to one if the participant is aware of Hertz's bankruptcy. Treat is an indicator that is equal to one if the participant is in one of the three treatment groups. Prior Hertz and Prior Enterprise are indicators that are equal to one if the participant previously purchased from Hertz or Enterprise, respectively. In the regressions associated with columns 2 and 4, we include: (i) an indicator variable that is equal to one if the participant is male; (ii) the participant's age, proxied by a series of indicator variables that are equal to one if the age is in a particular interval (e.g., 35-44 years old); (iii) the participant's income, proxied by a series of indicator variables that are equal to one if the income is in a particular interval (e.g., $50,000 to $74,999); and (iv) a series of indicator variables for different education levels (e.g., high-school graduate). Columns 3 and 4 exclude both the DIP treatment and survival treatment groups. We report robust standard errors in parentheses.

	Aware			
	(1)	(2)	(3)	(4)
Treat	0.637***	0.647***	0.648***	0.652***
	(0.024)	(0.024)	(0.027)	(0.027)
Prior Hertz		-0.032		-0.039
		(0.027)		(0.033)
Prior Enterprise		0.020		0.019
		(0.027)		(0.034)
Sample	Full	Full	Basic Treat	Basic Treat
Demographics FE	N	Y	N	Y
Observations	1106	1082	762	749
F-Statistic	678.6	706.8	561.9	563.2
Adj. R^2	0.400	0.420	0.419	0.429

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table A.3: Instrumental-Variables Regressions, Unincentivized Experiment

This table displays two-stage least squares (2SLS) estimates of our instrumental-variables regression (2) using data from our unincentivized experiment. The independent variable, WTP, is the participant's willingness to pay for Hertz defined in Section 3.1. We instrument for the endogenous variable Aware, defined in Table 3, using an indicator that is equal to one if the participant is in one of the three treatment groups. Columns 2, 3, 5, and 6 display 2SLS estimates. Columns 1 and 4 show estimates from ordinary least squares (OLS) regressions in which we regress WTP directly on the endogenous variable Aware. See Table 3 for the other variable definitions and the demographic control variables. Columns 4-6 exclude both the DIP treatment and survival treatment groups. We report robust standard errors in parentheses.

	WTP					
	(1)	(2)	(3)	(4)	(5)	(6)
Aware	-0.127***	-0.158***	-0.145***	-0.124***	-0.202***	-0.197***
	(0.024)	(0.036)	(0.035)	(0.027)	(0.044)	(0.042)
Prior Hertz			0.138***			0.130***
			(0.029)			(0.034)
Prior Enterprise			-0.137***			-0.147***
			(0.029)			(0.034)
Estimator	OLS	IV	IV	OLS	IV	IV
Sample	Full	Full	Full	Basic Treat	Basic Treat	Basic Treat
Demographics FE	N	N	Y	N	N	Y
Observations	1106	1106	1082	762	762	749

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table A.4: Additional Treatments, Unincentivized Experiment

This table displays ordinary least squares (OLS) estimates of equation (3), the effect of different treatments on willingness to pay, using data from our unincentivized experiment. The independent variable WTP is defined in Table 4. Treat is an indicator variable that is equal to one if the participant is in any of the three treatment groups. Survival treat and DIP treat are indicator variables equal to one if the participant is in the survival or DIP treatment groups, respectively. See Table 3 for the other variable definitions and the demographic control variables. We exclude the DIP treatment group in Column 1. We exclude the survival treatment group in Column 2. We report robust standard errors in parentheses.

	WTP			
	(1)	(2)	(3)	(4)
Treat	-0.131***	-0.131***	-0.131***	-0.127***
	(0.028)	(0.028)	(0.028)	(0.028)
Survival treat	0.094**		0.094**	0.105***
	(0.040)		(0.040)	(0.038)
DIP treat		0.029	0.029	0.030
		(0.043)	(0.043)	(0.042)
Prior Hertz				0.140***
				(0.030)
Prior Enterprise				-0.140***
				(0.029)
Estimator	OLS	OLS	OLS	OLS
Excluded Treatment	DIP	Survival	None	None
Demographics FE	N	N	N	Y
Observations	936	932	1106	1082
Adj. R^2	0.0211	0.0209	0.0173	0.0779

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table A.5: Mechanisms, Unincentivized Experiment

This table presents the results of the fourth stage of our unincentivized experiment. We ask participants a series of questions of the format "On a scale of 1 (not at all) to 7 (a great deal) how much do you agree with the following statement?" Each row presents summary statistics of numeric responses to a question of this form. Moving from the first row to the seventh row, the rows correspond to the following statements: (i) "Companies go bankrupt because their product is inferior;" (ii) "Companies go bankrupt because they have engaged in fraudulent activities;" (iii) "Companies go bankrupt because their products are overpriced;" (iv) "Going bankrupt is synonymous with ceasing to operate;" (v) "Companies that go bankrupt have sale prices that reflect a greater bargain;" (vi) "I worry that the cars will not be maintained well at a bankrupt car rental company;" (vii) "I worry that bankrupt companies have limited inventory." The table presents the averages and standard deviations of the responses. The third column is the p-value for a hypothesis test that the mean is greater than 4, which is a neutral response.

	Mean	SD	p-value for Mean > 4
Inferior product	3.34	1.6	1
Fraud	3.25	1.78	1
Overpriced	3.83	1.6	1
Cease to operate	3.64	1.88	1
Bargain prices	4.31	1.53	0
Maintenance	4.54	1.68	0
Inventory	4.41	1.64	0

Table A.6: Mechanisms on WTP, Unincentivized Experiment

This table presents the mechanism questions on willingness to pay using data from our unincentivized experiment. Demographics and prior experience with Hertz and Enterprise are included. We ask participants a series of questions of the format "On a scale of 1 (not at all) to 7 (a great deal) how much do you agree with the following statement?" Moving from the first row to the seventh row, the rows correspond to the following statements: (i) "Companies go bankrupt because their product is inferior;" (ii) "Companies go bankrupt because they have engaged in fraudulent activities;" (iii) "Companies go bankrupt because their products are overpriced;" (iv) "Going bankrupt is synonymous with ceasing to operate;" (v) "Companies that go bankrupt have sale prices that reflect a greater bargain;" (vi) "I worry that the cars will not be maintained well at a bankrupt car rental company;" (vii) "I worry that bankrupt companies have limited inventory."

	WTP			
	(1)	(2)	(3)	(4)
Maintenance	-0.023***	-0.019**	-0.045***	-0.039***
	(0.009)	(0.009)	(0.011)	(0.011)
Inventory	-0.009	-0.008	-0.009	-0.010
	(0.009)	(0.009)	(0.012)	(0.012)
Bargain prices	0.004	0.005	0.023**	0.027**
	(0.009)	(0.009)	(0.011)	(0.011)
Cease to operate	0.011	0.002	0.001	-0.003
	(0.007)	(0.007)	(0.009)	(0.009)
Inferior product	0.005	0.006	-0.010	-0.006
	(0.010)	(0.010)	(0.013)	(0.013)
Fraud	0.016*	0.013	0.030***	0.027***
	(0.009)	(0.009)	(0.011)	(0.010)
Overpriced	0.004	0.001	0.028**	0.018
	(0.010)	(0.010)	(0.013)	(0.013)
Sample	Full	Full	Aware	Aware
Controls FE	N	Y	N	Y
Observations	1106	1082	687	674
Adj. R^2	0.00964	0.0607	0.0429	0.0995

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

B Appendix - Robustness Checks

As a robustness check, we also reduce the sample to those respondents who correctly filled out the question, "Which of the following stores are currently in Chapter 11 bankruptcy? (select all that apply)". The possible answers were the following: Budget, Enterprise, Hertz, Alamo Rent A Car, National Car Rental, Advantage Rent A Car, None of these. Those that selected "Hertz" only are included.

Table B.1: Results for Hertz Bankruptcy Awareness Only

This table presents first stage and the IV results only on those participants who correctly identified Hertz as the only car rental company on the list that was currently in Chapter 11 bankruptcy.

	First Stage	IV
	(1)	(2)
Treat	0.572***	
	(0.024)	
Correct Bankruptcy List		-0.338***
		(0.045)
Prior Hertz	0.004	0.184***
	(0.027)	(0.030)
Prior Enterprise	0.003	-0.157***
	(0.028)	(0.032)
Sample	Full	Full
Demographics FE	Y	Y
Observations	1218	1218
F-Statistic	0	
Adj. R^2	0.301	0.0586

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

We additionally looked at willingness to pay only for those in the control group and regressed WTP on whether they were aware of Hertz bankruptcy. For the control group, this means that the respondents already knew about Hertz' bankruptcy without us telling them.

Table B.2: Results for Control Group Only

This table presents an OLS of whether the respondent is aware of the Hertz bankruptcy on willingness to pay. Only those in the control group are included.

	WTP	
	(1)	(2)
Aware	-0.026	-0.026
	(0.042)	(0.042)
Prior Hertz		0.130***
		(0.044)
Prior Enterprise		-0.154***
		(0.047)
Sample	Control	Control
Demographics FE	N	Y
Observations	453	445
Adj. R^2	-0.00134	0.0168

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$