Individual-level Price Elasticity of Charitable Giving: Insights from Large-scale Field Experiments

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Abstract

This study investigates the individual-level price elasticity of charitable giving by employing a field experiment coupled with a structural estimation. Our findings reveal an average price elasticity of -1.22, suggesting that a 10% increase in the price of giving leads to a 12.2% decrease in charitable contributions. Notably, the analysis highlights considerable heterogeneity in price elasticity across various demographic and behavioral factors, such as age, education, income, rationality, and political affiliation. A more pronounced distribution of price elasticity is observed within subgroups as opposed to across subgroups, indicating greater heterogeneity within categories than between them. Simulation results demonstrate that disregarding within-group heterogeneity in price elasticity can result in inaccurate policy implications, especially regarding the influence of tax policies on charitable giving. Overall, the study emphasizes the significance of accounting for differences in price elasticity both across and within subgroups, with particular attention to within-subgroup variations, for a precise estimation of policy intervention effects on charitable giving.

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1 Introduction

In the literature on the price elasticity of charitable giving, some researchers have realized that to better inform tax policy for charitable giving, individual-level price elasticity of charitable giving estimation is necessary. For example, Vesterlund (2006) is well aware of the necessity of using individual price elasticity to better inform tax policy when not all givers experience the same change in the marginal tax rate. Chay and Greenstone (2005) voice the same need to estimate the impact of tax policy on charitable giving in the market for clean air. However, previous studies have primarily estimated price elasticity at an aggregate level, overlooking the significant heterogeneity that exists within demographic categories. This is due to a lack of data that limits variation in the price of giving. The marginal tax rate does not often change over time for the administrative data. For experimental data, subjects do not participate in enough games for individual-level estimation. We estimate the individual-level price elasticity of charitable giving using data from a unique artefactual field experiment. By manipulating the price of giving in each of the 50 modified dictator games that each subject participated in, we generate sufficient variation in the price of giving to allow for precise estimation of individual-level price elasticity.

Estimating the price elasticity at the individual level enables comparison of price elasticity ranges, rather than means, across groups. Previous studies on the price elasticity of charitable giving have identified significant heterogeneity in the price elasticity across various characteristics, including data characteristics such as data sources,[1] data shape,[2] price mechanisms,[3] charity types,[4] income levels,[5] estimation methods.[6] However, these studies have focused on heterogeneity between groups. By estimating individual price elasticity, in

[1]See Fisher (2000), Peloza and Steel (2005), Peloza and Steel (2005),Brooks (2007) etc.

[2]See Ribar and Wilhelm (1995)

[3]See Eckel and Grossman (2006b),Davis et al. (2005),Eckel and Grossman (2017),Blumenthal et al. (2012),Lukas et al. (2010),Bénabou and Tirole (2006)

[4]See Yetman and Yetman (2013),Bradley et al. (2005),Feldstein (1975), and Helms and Thornton (2012)

[5]Fack and Landais (2010),Slemrod (1989),Anderson and Beier (1999),Clotfelter and Steuerle (1981), and Lankford and Wyckoff (1991)

[6]See Almunia et al. (2020),Castillo and Petrie (2020),Bradley et al. (2005),Kingma (1989), andGrant et al. (2016)

addition, to comparing the means across groups, we can also compare the distributions of price elasticity across groups, as well as investigate heterogeneity within a specific group. Our findings suggest that heterogeneity in price elasticity is more pronounced within a group than between groups, underscoring the importance of individual-level analysis.

The individual-level price elasticity of charitable giving provides a more nuanced understanding of how individuals respond to changes in the price of giving in terms of giving, such as the tax deduction policy. This information can help policymakers make informed decisions about the design and effectiveness of the tax deduction policy, leading to more efficient allocation of resources and a greater impact on philanthropic causes. By considering individual donors' unique motivations and characteristics, a more targeted approach to incentivizing giving can be taken, ultimately resulting in a more successful and effective charitable sector.

This study estimating the individual-level price elasticity of charitable giving can contribute to a better understanding of how individuals make decisions about charitable giving and how they respond to changes in the price of giving. The insights gained from individual-level estimation can also contribute to fundraising mechanism design by better understanding their donor base and tailor their fundraising strategies accordingly. Additionally, understanding the heterogeneity in giving behavior can lead to a more efficient allocation of resources within the charitable sector, ultimately resulting in a greater impact on the charitable causes being supported.

The results of our study indicate that individual-level price elasticity varies widely among participants. Our analysis also reveals that factors such as income, age, nationality, rationality, employment status, charity types, education, regions, and political affiliation play a significant role in determining an individual's price elasticity. Our main finding is that the mean of price elasticity is -1.22, when we limit the price elasticities to values larger than -10,[7] which is consistent with the results of previous studies on this topic, such as Peloza

[7]There are two main reasons why we restrict the price elasticity of charitable giving to be above -10. Firstly, the analysis conducted by Peloza and Steel (2005) reviewed 69 studies of the tax elasticity of charitable

and Steel (2005). This similarity supports the validity of our estimation and strengthens the conclusion that people exhibit a moderate level of responsiveness to changes in price. However, there exists substantial heterogeneity in the individual-level price elasticities, suggesting that while some subjects are relatively inelastic to price changes, others are highly sensitive to changes in price.

The rest of this paper is organized as follows. We provide the experimental design in Section 2. Next, in Section 3, we present the structural model and the estimation results. In section 4, we investigate the heterogeneity of price elasticity of charitable giving from different aspects. In Section 5, we run a few simulations to show how the aggregate price elasticity messes up the impact of price change on charitable giving. The conclusion is in Section 6.

2 Experimental Design

2.1 The ALP and Charity Navigator

We used the American Life Panel (ALP henceforth), a 6000-member U.S-based internet panel, to conduct the experiment.[8] The panel was chosen for its diverse and representative sample, as well as its ability to provide rich demographic data. The subjects of the experiment came from every state except Alaska and ranged in age from 22 to 92. The sample was 55% female, 80% white, and 45% held a college degree, and their employment figures were similar to the US population as a whole.

To provide a large and diverse set of charities, we used Charity Navigator, a rating agency

giving and found that their tabulated estimates ranged from -6.15 to 0.06. This suggests that a price elasticity of less than -10 is implausible and inconsistent with existing empirical evidence. Secondly, in my own research on The Price Elasticity of Charitable Giving: A Systematic Review and Meta-analysis, I found that the mean price elasticity was -1.24 with a standard deviation of 1.06. This implies that -10 is around 8 standard deviation from the mean -1.24, and therefore, it is reasonable to assume that the price elasticity of charitable giving below -10 is unlikely and not supported by the existing empirical evidence.

[8]For more information on the ALP, please visit: https://mmicdata.rand.org/alp/.

that rates over 7000 charities based on efficiency and accountability.[9] It provides insights into a nonprofit's financial stability, adherence to best practices for both accountability and transparency, and results reporting. It is the largest and most-utilized evaluator of charities in the United States.[10] Charity Navigator is structured as follows: there are nine main categories, each of which contains various charity causes. Within each charity cause, there are multiple charities that fall under it. We scraped the top 10 ranked charities within each of charity cause under the nine categories on the website, resulting in a list of 340 charities in total.

2.2 Experimental Procedures

Subjects in the experiment are given instructions and overview and then asked to select a charity that they would like to donate to from a list provided through expandable/collapsible tables adapted from the Charity Navigator website. The list is based on a selected category and shows up the top 10 highest-rated charities for that category. Subjects can also choose their own preferred charity by writing it in their preferred charity if they are not available on the list. Immediately after the charity selection process, subjects participated in 50 independent modified dictator games, which were played between the subject and their chosen charity. In the standard dictator game, the active player (the dictator) divides their endowment of wealth between themselves and a passive player, such that the total payoffs are given by $\pi_b + \pi_0 = w$ with a constant price of giving 1 , but in a modified dictator, the passive player is a charity chosen by the dictator and the price of giving varies, represented as $x_i + g * p_g = w$, where x_i is the payoff to the subject and p_g is the relative price to donating to the chosen charity.

In each game, participants had to allocate tokens between their personal account and the account of the chosen charity by choosing an allocation along their budget lines through a

[9] http://www.charitynavigator.com.

[10] https://morristowngreen.com/2021/02/16/covid-relief-drives-record-giving-at-community-foundation-grants-topped-87-5m-in-2020/

point-and-click design. The budget line for each decision task was selected randomly by the computer from the budget line pool where lines intersect at least one axis at or above the 50-token level and intersect both axes at or below the 100-token levels. The budget lines selected for each participant in the task section are independent of each other and of the budget lines selected for other participants. An illustration of a computer program dialog window as viewed by a participant is presented in the experimental instructions provided in Appendix A.

The number of tokens determines the payoff for each game that has been allocated to both personal and charity accounts. At the end of the experiment, one decision round was randomly selected for the payment for each participant, with 2 tokens equivalent to 1 dollar.

3 Structural Model

To ensure that the observed choices of our experimental subjects reflect utility maximization, we assess their data against the principles of the Generalized Axiom of Revealed Preference (GARP). We use Afiat's (1972) Critical Cost Efficiency Index (CCEI) to measure the extent to which the data comply with GARP. The CCEI is a measure of rationality and is bounded between 0 and 1, with scores closer to 1 indicating greater rationality. Our results show that over 75% of the data have a CCEI score greater than 0.8, with a mean score of 0.883. This suggests that charitable giving in our study is a standard utility-maximizing activity, and we have generated enough data to estimate parameters at the individual level. Thus, we proceed to test the structural properties of each subject's individual utility function.

Given the rationality analysis that the observed pattern of CCEI scores sufficiently close to 1, we assume that the data is generated by a well-behaved utility function. To be consistent with previous literature, we assume that the utility function, u_d, is separable and homothetic. These two assumptions and the restriction imposed by our experimental design, that choices must be budget balanced, suggest that u_d is of the family of Constant

Elasticity of Substitution (CES) utility functions as equation (1). We estimate these CES utility functions using non-linear Tobit maximum likelihood estimation (MLE) and find that subject heterogeneity is more pronounced within demographic and charity types, rather than across them.

$$u_d = [\alpha \cdot \pi_d^\rho + (1-\alpha) \cdot \pi_o^\rho]^{\frac{1}{\rho}} \tag{1}$$

where the π_d is the payoff for participants themselves, while π_o is the payoff for participants' selected charity. The CES utility function has two parameters: ρ and α. ρ represents the curvature of each individual's indifference curves and their sensitivity to price. Meanwhile, α is the relative weight one puts on herself and her selected charity. The parameter of interest in this study is ρ. That is because, within the context of a CES framework, it follows that $\frac{1}{\rho-1}$ is the constant elasticity of substitution, σ. Prior studies, such as Ackerman and Auten (2006) and Cordes (2011), have found that the income effect resulting from changes in the price of giving is insignificant. This is attributed to the low proportion of income allocated to charity and the limited magnitude of the income elasticity. However, these studies make an implicit assumption that donors allocate their charitable giving out of their total income and that all other sources of income are additively separable in their utility function. That is in our experiment donors treated their endowment as part of their income and they made their giving decision based on the summation of their endowment and all their other income sources, their giving just accounts for a tiny share of their total income. Therefore, the income effect resulting from changes in the price of giving is ignorable, and the elasticity of substitution is an appropriate proxy for the price elasticity of charitable giving.

This study also considers an alternative perspective based on Thaler (1985), where donors treat the utility from charity and all other sources of income as segregated. Specifically, donors initially allocate their total income into two buckets: a charitable giving bucket and a remaining total income bucket. If donors give to charities out of their charitable giving bucket, and all other sources of income are additively separable, then the income

effect cannot be ignored. That is in our experiment, donors treated their endowment and all the rest of their income sources separately, which means that they did not integrate their experimental endowment into their rest sources of income. Therefore, they treated their experimental endowment as their total income, and then their giving share is a much higher share of their endowment compared to their total income. As a result, the income effect cannot be ignored, and the price elasticity of charitable giving would depend on the income and substitute elasticities. In this scenario, we calculate the price elasticity using $\varepsilon_p = k * \varepsilon_I + (1-k) * \varepsilon_s$, where k is the proportion of income spent on charitable giving, ε_p is the price elasticity, ε_I (set to 0.7 based on our meta-analysis) is the income elasticity, and ε_s is the elasticity of substitution.

4 Results

4.1 The price elasticity without the income elasticity

Using data from our experiment and σ as a proxy of the price elasticity of charitable giving, we estimated the individual-level price elasticity of charitable giving. Our analysis indicates that the price elasticity of giving varies widely across individuals, with estimates ranging from -9.78 to -0.05, and a mean estimate of -1.22 when we limit the price elasticities to values larger than -10. The distribution of the estimated price elasticity of charitable giving is perhaps more informative.

The distribution of the individual-level price elasticity of charitable giving is shown in Figure 2. As shown in the histogram, the distribution is highly skewed right ranging from -9.78 to -0.05, with a majority of observations concentrated around -0.76 which is the median of the price elasticity. These findings suggest that there is a considerable degree of heterogeneity in the price responsiveness of charitable giving, with a substantial share of donors exhibiting relatively low price elasticity.

4.2 The price elasticity with the income elasticity

Our analysis revealed that the price elasticity of charitable giving is significantly influenced by how we assume donors allocate their giving - out of their total income or their charitable bucket. If we assume donors allocate their giving out of their charitable giving, which means in our experimente donors treated their endowment and all the rest of their income sources separately, then their giving share is a way higher share of their endowment compared to their total income. As a result, the mean of the price elasticity falls to -0.2 with a standard deviation of 1.01 when we limit the absolute value of price elasticities to values smaller than 10. The distribution of the price elasticity is visualized in Figure 4. The distribution of the price elasticity is still highly skewed right with the range of the price elasticity is between -10 and 0.7. The median of the price elasticity is -0.03.

4.3 The Price Elasticity across Demographic subgroups

We also decompose the price elasticity of charitable giving with different demographic subgroups, including gender, age, education, race, and employment variables in Table (2). The results indicate substantial variation in price elasticity across these subgroups. Specifically, we found that the price elasticity of charitable giving was higher among women compared to men, and also higher among younger individuals compared to older individuals. Additionally, we found that price elasticity was higher among individuals with higher levels of education, as well as among certain racial and employment subgroups. However, more variation in the price elasticity is observed within a subgroup than across different subgroups, this suggests that there is more heterogeneity in price elasticity within the subgroup than between different subgroups. Overall, these results suggest policies that rely on price incentives, such as tax credit, may be more effective among certain subgroups compared to others. Most importantly, these results suggest to test the effectiveness of these policies, individual-level price elasticity is necessary for more accurate evaluation for policymakers and practitioners who seek to promote charitable giving through tax policy, as well as for researchers who aim

to understand the determinants of charitable behavior.

5 Counterfactuals

In this section, we use simulations to explore the potential limitations of relying on the mean of price elasticity when making decisions about increasing giving. Specifically, we consider two counterfactual scenarios to illustrate how using the mean of price elasticity alone can be misleading.

5.1 The impact of tax deduction on charitable giving

In this simulation, we aim to investigate how the tax incentive impacts charitable giving behavior of individuals with different marginal tax rate for different income levels. We used the tax brackets and rates that are reported in Table (4) to model the tax system:

We randomly generated the initial pre-tax income levels of 1009 individuals from a normal distribution with mean 100000 and standard deviation 20000. We also generated their initial giving amounts from a uniform distribution between 500 and 1000. Using the tax brackets and rates, we calculated the initial tax liability and post-tax income level for each individual. We then calculated the price of giving for each individual using 1 minus their highest tax rate.

We assumed that the price elasticity of giving varies among individuals and used the individual-level price elasticity from our experiment with mean -1.22 and standard deviation 1.4. For each individual, we used their initial donation amount and calculated their tax savings due to the donation, the new tax liability, and the new corresponding disposable income. Using the individual-level price elasticity of giving, we calculated the change in giving amount due to the change in disposable income and the change in price of giving.

We compared the initial total giving with the new total giving after applying the tax

incentive, and calculated the increase in giving for each individual using their respective individual-level price elasticity. Finally, we plotted the distribution of increase in giving for each individual using a histogram, and compared it with the aggregate increase in giving calculated using the mean price elasticity, which is reported in Figure 1. From this figure, the difference in using mean price elasticity and individual-level price elasticity could lead to over- or under-estimation of the increase in giving for some individuals, especially those with significantly different price elasticity compared to the mean.

Overall, this simulation helps us understand the impact of tax incentives on charitable giving behavior and sheds light on the heterogeneity of individual-level price elasticity of giving.

5.2 The impact of a 12% flat tax credit on charitable giving

In this section, to compare the impact of a 12% flat tax credit on charitable giving using individual-level price elasticity and an aggregate mean of price elasticity from our experimental estimation, we conducted a Monte Carlo simulation. In the simulation, we assume each donor's income is $1000 and her initial donation is 10% of her income. Our sample size is 1009 along with an income elasticity, 0.7.

Using the individual-level price elasticity estimated from our experiment, we generated random samples of the population with different values of individual-level price elasticity. For each simulated individual, we computed the impact of the 12% flat tax credit on their charitable giving based on their individual-level price elasticity. We then aggregated these impacts across the population to obtain an estimate of the impact of the 12% flat tax credit at the aggregate level.

We also generated random samples of the population with an aggregate mean of price elasticity of -1.22 from our experimental estimation when we limit the price elasticity to values larger than -10. For each simulated population, we computed the impact of the 12% flat tax credit on the total amount of charitable giving based on the aggregate mean of price

elasticity.

Our simulation results showed that the impact of the 12% flat tax credit on charitable giving was higher when using individual-level price elasticity compared to an aggregate mean of price elasticity of -1.22 from our experimental estimations. Specifically, we found that the average impact of the 12% flat tax credit on charitable giving at the individual level was 15.58%, whereas the average impact at the aggregate level was 14.73%, with each subject's increase in giving is $148.66. Figure 2 shows the distribution of the increase in giving across individual donors as a result of the 12% flat tax credit on charitable giving using the individual-level price elasticity of charitable giving. It is clear from the plot that there is a significant amount of heterogeneity in the increase in giving across donors. While some donors experience a large increase in giving, others experience little increase. This suggests that the effect of the tax credit on charitable giving varies considerably depending on the characteristics of individual donors. Further analysis, in the next section, is needed to determine which donor characteristics are most strongly associated with larger or smaller increases in giving.

6 Heterogeneity

In this section, we utilize the elasticity of substitute as a proxy for the price elasticity and investigate the variability of the price elasticity among different groups and within each specific group.

6.1 Across rationality

The distribution of price elasticity is reported in Figure 5 and Table (2). Across rationality levels, our analysis suggests no significant relationship between the price elasticity of charitable giving and the level of rationality, as measured by the Common Cause Engagement Index (CCEI). While there is a potential trend that donors with higher levels of rationality

may exhibit greater sensitivity to changes in the price of giving, this effect is only observed among donors with a CCEI score of 0.9 or above. However, the distribution of elasticities is noticeably wider among donors with higher levels of rationality, indicating a greater degree of variability in how these donors respond to changes in the price of giving. These results highlight the importance of accounting for differences in rationality levels when estimating the price elasticity of charitable giving, as failing to do so may lead to inaccurate estimates. The observed heterogeneity within rationality levels suggests that future research could explore other factors that contribute to this variability, such as personality traits or social norms.

6.2 Across income levels

Figure 6 we illustrate the distribution of price elasticity across different income levels. Our analysis reveals a significant degree of variation in the price elasticity of giving among income groups, with the mean elasticity ranging from -0.88 for the $\$40,000 - \$49,999$ income bracket to -1.72 for the lowest income group. As shown in the graph, the price elasticity is higher at the two extremes of the income distribution, indicating that individuals with the lowest and highest incomes are more sensitive to changes in price than those in the middle income range. Moreover, the variability in the means of price elasticity highlights the presence of substantial heterogeneity across income levels. Additionally, the wide range in price elasticity within each group suggests there exists notable heterogeneity within each income level as well. Overall, our results suggest that income level plays a significant role in shaping the price elasticity of giving, and should be taken into consideration when designing effective fundraising strategies.

6.3 Across education degrees

The relationship between the price elasticity of charitable giving and the education level of donors is a topic of great interest in the philanthropic community. To shed light on this

issue, we also analyzed our estimation across different education levels. Our results, reported in Figure 7, indicate that there is some heterogeneity in price elasticity across education levels. Specifically, we find that the mean price elasticity of giving ranges from -1.15 among donors with a bachelor degree to -1.41 among donors with a master degree. Furthermore, the distribution of price elasticity is noticeably wider among donors with graduate degree, especially with the master and the professional school degree, indicating a greater degree of variability in how these donors respond to changes in the price of giving.

However, even within specific education levels, we find a wide range of price elasticities. Furthermore, the heterogeneity within a specific level again is more pronounced than it is across levels. For example, among donors with a professional school degree, the price elasticity ranges from -0.048 to -4.86. This heterogeneity suggests that education alone may not be a strong predictor of an individual's price elasticity of giving.

6.4 Across charities

Our analysis reveals notable heterogeneity in price elasticity across charities, as reported in Figure 8. Donors' responsiveness to changes in the price of giving varies widely across different charitable organizations. We find that the median price elasticity ranges from -0.5 to -2.0, with the highest elasticity observed in donors who give to international charities and the lowest elasticity in those who give to religious charities.

Furthermore, we also observe significant heterogeneity in price elasticity within each specific charity, which again is more notable than it across charities. For instance, among donors who give to international charities, the price elasticity ranges from around 0 to smaller than -6.0, indicating substantial variability in the degree to which these donors respond to changes in the price of giving.

6.5 Across regions

In recent years, researchers have become increasingly interested in understanding how the price elasticity of charitable giving varies across regions in the United States. Previous studies have found notable heterogeneity in the price elasticity of giving across various demographic and behavioral characteristics, such as age, education, and income. However, little research has been conducted on the heterogeneity of price elasticity across different regions of the country.

Our analysis of the price elasticity of charitable giving across regions and within each region in the US, as shown in Figure 9, reveals some heterogeneity across regions. Specifically, we find that the mean price elasticity in the West is the higher than others'. Interestingly, the distribution of elasticities is noticeably wider in both West and Northest regions, indicating greater variability in how donors respond to changes in the price of giving.

When examining heterogeneity within a specific region, we observe considerable variation in price elasticity in each region, which again is more remarkable than is across regions. For example, in the Northeast region, donors' price elasticity of giving is over -3 at the $10th$ precentile, while it is almost zero at $90th$ percentile. Our findings suggest that accounting for regional differences is important in accurately estimating the price elasticity of charitable giving, and that examining heterogeneity within specific regions can provide valuable insights for charitable organizations and policymakers.

6.6 Across political parties

Donors affiliated with different political parties have different preferences and values, which can affect how they respond to changes in the price of giving. Therefore, understanding the heterogeneity in price elasticity across political parties is crucial for designing effective policies to encourage charitable giving. For example, (Kim et al., 2021) show that people with conservative political orientation tend to respond less significantly to the tax incentive.

These results of the heterogeneity in price elasticity of giving across political parties in the

US are reported in Figure 10. Our analysis reveals that the price elasticity of giving varies considerably across political parties, with the mean elasticity ranging from -1.4 among donors affiliated with the Democratic Party to -1.2 among donors affiliated with the Republican Party. Within both parties, there exists even more considerable heterogeneity in the price elasticity than it across parties, with some donors being highly responsive to changes in the price of giving, while others are relatively unresponsive. This finding highlights the need to consider political affiliation when estimating the price elasticity of charitable giving, as it can have a significant impact on the responsiveness of donors to changes in the price of giving.

6.7 Across races

Individuals' charitable giving behavior is influenced by a range of factors, including demographic characteristics such as race. Previous studies have explored the heterogeneity of price elasticity across these factors, highlighting the need for targeted policy interventions that can better promote charitable giving in diverse populations. In particular, the identification of the heterogeneity in price elasticity across races can shed light on the unique charitable giving motivations and preferences of different communities, informing the development of more effective strategies for encouraging charitable giving. For example, (Blumenthal et al., 2012) and (Bradley et al., 2005) investigate the price elasticity heterogeneity across races and find that whites and Asians gave less relative to other races.

In this subsection, we focus specifically on the heterogeneity in price elasticity across races, including white, black, American Indian, Asian, and other. The analysis is reported in Figure 11. Our results reveal that American Indians have the highest price elasticity, while Asians have the lowest. Again, within each race, we observe considerable heterogeneity in price elasticity. Both white and American Indian donors exhibit a wide distribution of elasticities, indicating a large degree of variation within these groups. In contrast, Asian donors exhibit the narrowest distribution of elasticities, indicating less variability in how

they respond to changes in the price of giving. These findings suggest that nonprofits should take into account the significant variation in price elasticity among different racial groups when developing targeted fundraising campaigns.

6.8 Across genders

Research has shown that men and women have different motivations and attitudes towards charitable giving, which may lead to differences in their price elasticity of giving. For example, (Blumenthal et al., 2012) finds that females give more in gross contribution than males.

Our analysis examines the heterogeneity in price elasticity of charitable giving across genders, which is reported in Figure 12. We find that the mean price elasticity of giving for female donors is higher than is for male donors. This indicates that, on average, female donors are less responsive to changes in the price of giving than male donors.

More interestingly, the distribution of price elasticities within each gender reveals even more considerable heterogeneity than it across genders. Among male donors, the distribution of elasticities is noticeably wider than among female donors, indicating a greater degree of variability in how male donors respond to changes in the price of giving. Specifically, we find that the $10th$ and $90th$ percentiles are -3.1 and 0.05 for male donors, while the $10th$ and $90th$ percentiles are -2.3 and -0.05 for female donors. This suggests that there is a greater potential for identifying subgroups of male donors who may be more or less responsive to changes in the price of giving.

6.9 Across employment status

Studies have found that employment status can have a significant impact on charitable giving, with factors such as income, job security, and time constraints affecting the willingness and ability of individuals to give. For example, Tietz and Parker (2014) examined the relationship between employment status and charitable giving in Canada. They found that both employed and self-employed individuals were more likely to donate to charity than un-

employed individuals. Moreover, they found that self-employed individuals were more likely to donate and gave more money to charity than employed individuals. The study suggests that employment status is an important factor to consider when analyzing charitable giving behavior.

Our analysis reveals notable heterogeneity in the price elasticity of charitable giving across employment status, which is reported in Figure 13. Overall, we find that the heterogeneity is more pronounced within each employment status group than across different employment status groups one more time. Specifically, we find that Homemakers have the highest price elasticity of charitable giving, whereas Retired individuals have the lowest price elasticity. Moreover, our results suggest that the price elasticity of charitable giving varies significantly within each employment status group, indicating that broad generalizations about the effect of employment status on price elasticity may not be appropriate. In sum, our findings underscore the importance of considering the heterogeneity both in price elasticity of charitable giving both within and across employment status when designing fundraising campaigns targeted at specific employment status groups.

7 Conclusion

In this paper, we estimate the individual-level price elasticity of charitable giving using an artifactual field experiment and structural estimation. Our findings contribute to the literature on charitable giving by providing more accurate estimates of price elasticity and identifying sources of heterogeneity across subgroups.

We find that the average individual-level price elasticity of charitable giving is -1.22, indicating that a 1% increase in the price of giving results in a 1.22% decrease in giving. Furthermore, we identify significant heterogeneity in price elasticity across subgroups, including demographic characteristics such as age, education, and income, as well as behavioral factors such as rationality and political affiliation. Interestingly, we observe that the het-

erogeneity of price elasticity is more pronounced within subgroups than across subgroups, indicating greater variability within demographic categories than between them.

Our simulations further highlight the importance of accurately estimating individual-level price elasticities. Specifically, we find that using a mean elasticity to estimate the impact of a tax policy on charitable giving can result in misleading estimates, as the impact varies significantly across donors with different elasticities.

Our findings have important implications for policymakers and charities. Our results suggest that targeting specific subgroups with tailored messaging and price incentives could be an effective strategy for increasing charitable giving. For example, charities may want to consider offering different price incentives to donors based on their income or rationality levels. Additionally, policymakers may want to consider implementing tax policies that incentivize giving among certain subgroups.

In conclusion, this study provides important insights into the heterogeneity in price elasticity of charitable giving and underscores the importance of accounting for individual-level differences in charitable behavior. By incorporating demographic subgroups and individual-level heterogeneity into our analysis, we gain a more nuanced understanding of how changes in the price of giving affect charitable behavior. These findings have important implications for policymakers and practitioners seeking to design effective interventions to promote charitable giving.

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Tables

	Obs.	Mean	Median	25%	75%	Min.	Max.
All	1009	-1.221	-0.759	-1.599	-0.307	-9.784	-0.048
CCEI$\geq$ 0.6	973	-1.239	-0.760	-1.621	-0.314	-9.784	-0.048
CCEI$\geq$ 0.7	930	-1.238	-0.753	-1.611	-0.295	-9.784	-0.048
CCEI$\geq$ 0.8	792	-1.234	-0.704	-1.581	-0.273	-9.784	-0.048
CCEI$\geq$ 0.9	548	-1.265	-0.612	-1.410	-0.196	-9.784	-0.048
CCEI$\geq$ 0.95	399	-1.399	-0.577	-1.675	-0.141	-9.776	-0.048

Table 2: Summary elasticity by CCEI without outliers

	Obs.	Mean	Median	25%	75%	Min.	Max.
All	1009	-1.221	-0.759	-1.599	-0.307	-9.784	-0.048
Men	453	-1.210	-0.726	-1.580	-0.289	-9.784	-0.048
Women	557	-1.227	-0.787	-1.614	-0.329	-9.712	-0.048
(0-65]	765	-1.278	-0.787	-1.685	-0.346	-9.712	-0.048
65+	272	-1.067	-0.619	-1.229	-0.203	-9.784	-0.048
High School	186	-1.273	-0.868	-1.676	-0.390	-9.784	-0.048
H-Bachelor	619	-1.147	-0.716	-1.549	-0.280	-9.448	-0.048
Master	152	-1.409	-0.789	-1.605	-0.287	-9.712	-0.048
PSD	27	-1.273	-0.588	-1.718	-0.247	-4.863	-0.048
Doctorate degree	29	-1.386	-0.921	-2.196	-0.361	-6.631	-0.048
White	805	-1.238	-0.746	-1.605	-0.294	-9.784	-0.048
Black	106	-1.120	-0.807	-1.485	-0.351	-9.664	-0.048
American Idian	14	-1.668	-1.418	-1.770	-0.443	-6.373	-0.154
Asian	24	-0.685	-0.499	-0.916	-0.100	-3.226	-0.048
Other	64	-1.250	-0.988	-1.883	-0.382	-7.956	-0.048
Employed	560	-1.263	-0.761	-1.595	-0.347	-9.513	-0.048
Unemployed	69	-1.347	-1.057	-1.770	-0.294	-8.324	-0.048
Disabled	114	-1.042	-0.790	-1.570	-0.392	-4.705	-0.048
Retired	282	-1.080	-0.629	-1.297	-0.216	-9.784	-0.048
Homemaker	78	-1.540	-0.975	-1.877	-0.352	-9.712	-0.048
Other	31	-1.227	-0.758	-1.832	-0.265	-5.444	-0.048

Table 1: Summary elasticity across demographic subgroups without outliers

	Obs.	Mean	Median	25%	75%	Min.	Max.
All	1009	-1.221	-0.759	-1.599	-0.307	-9.784	-0.048
Less than $5,000	29	-1.720	-1.698	-2.022	-1.155	-3.834	-0.054
$5,000-$7,499	15	-1.350	-0.872	-1.842	-0.290	-6.373	-0.048
$7,500-$9,999	37	-1.352	-1.001	-1.824	-0.499	-6.576	-0.048
$10,000-$12,499	23	-0.951	-0.590	-1.393	-0.418	-3.939	-0.048
$12,500-$14,999	27	-1.257	-1.117	-1.477	-0.340	-6.650	-0.048
$15,000-$19.999	50	-0.846	-0.617	-1.284	-0.239	-3.226	-0.048
$20,000-$24,999	45	-1.094	-0.813	-1.565	-0.285	-6.365	-0.048
$25,000-$29,999	62	-1.049	-0.707	-1.734	-0.218	-7.438	-0.048
$30,000-$34,999	51	-1.001	-0.765	-1.628	-0.425	-3.197	-0.049
$35,000-$39,999	53	-1.175	-0.947	-1.518	-0.375	-8.749	-0.048
$40,000-$49,999	85	-0.880	-0.658	-1.131	-0.126	-7.573	-0.048
$50,000-$59,999	92	-1.125	-0.626	-1.418	-0.248	-9.784	-0.048
$60,000-$74,999	117	-1.094	-0.664	-1.345	-0.270	-9.776	-0.048
$75,000 or more	320	-1.485	-0.796	-1.841	-0.328	-9.712	-0.048

Table 3: Summary elasticity across income levels without outliers

Income Bracket	Tax Rate
$0 to $10,275	10%
$10,276 to $41,775	12%
$41,776 to $89,075	22%
$89,076 to $170,050	24%
$170,051 to $215,950	32%
$215,951 to $539,900	35%
$539,901 or more	37%

Table 4: Tax Brackets and Rates

Figures

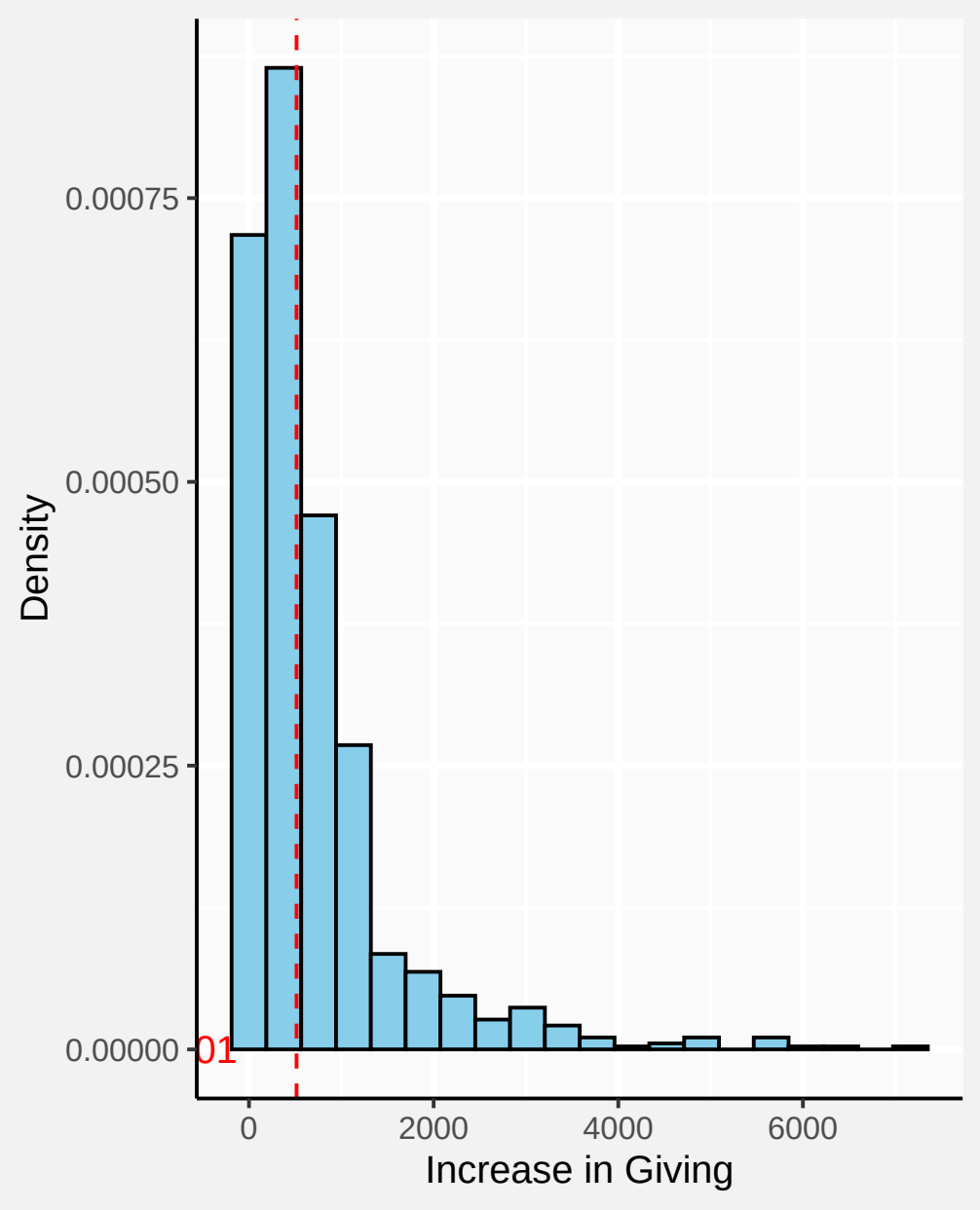


Figure 1: The distribution of increase in giving
Note: The red dashed line is the increase in giving using the mean of the price elasticity.

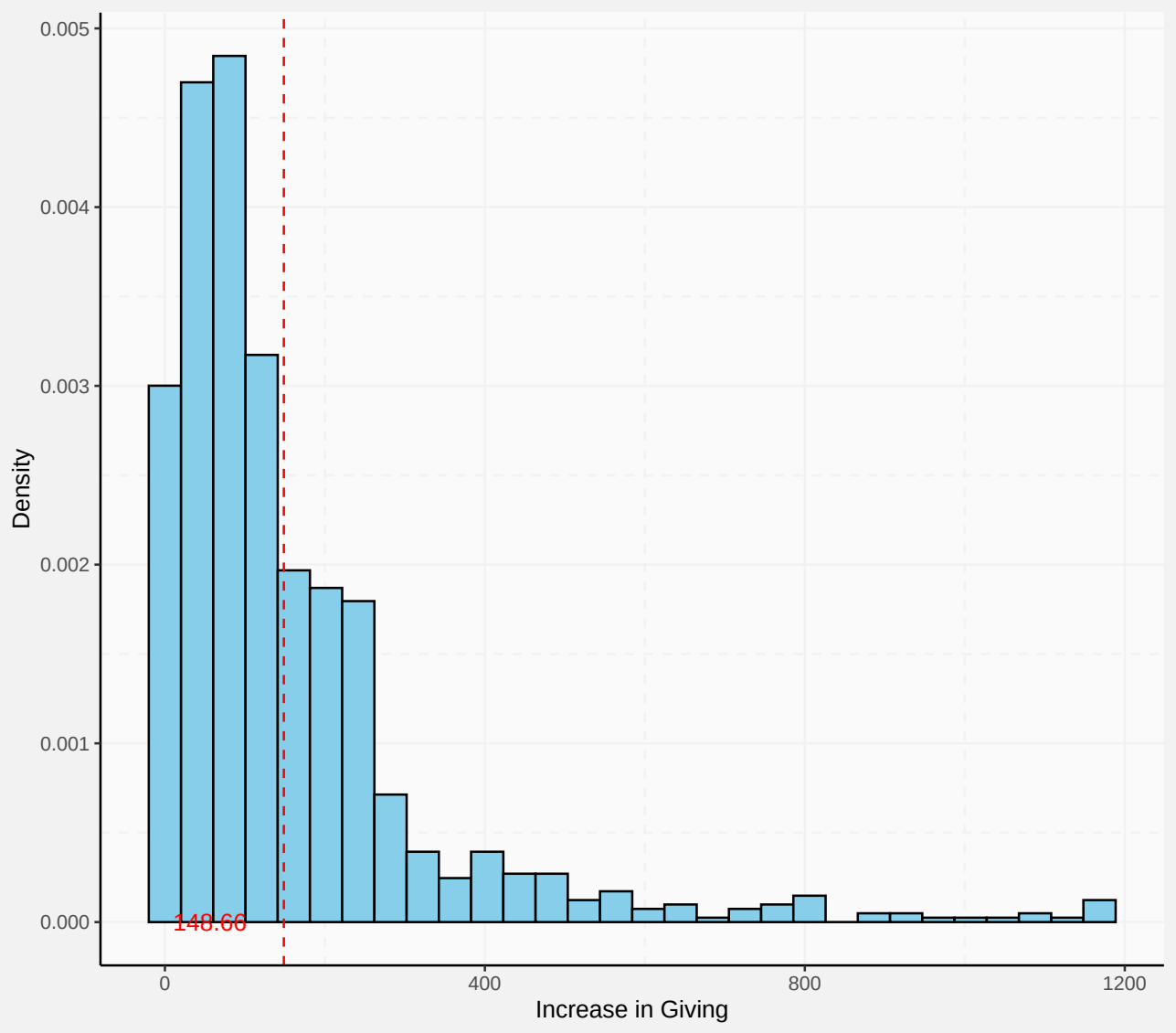


Figure 2: The distribution of increase in giving

Note: The red dashed line is the increase in giving using the mean of the price elasticity.

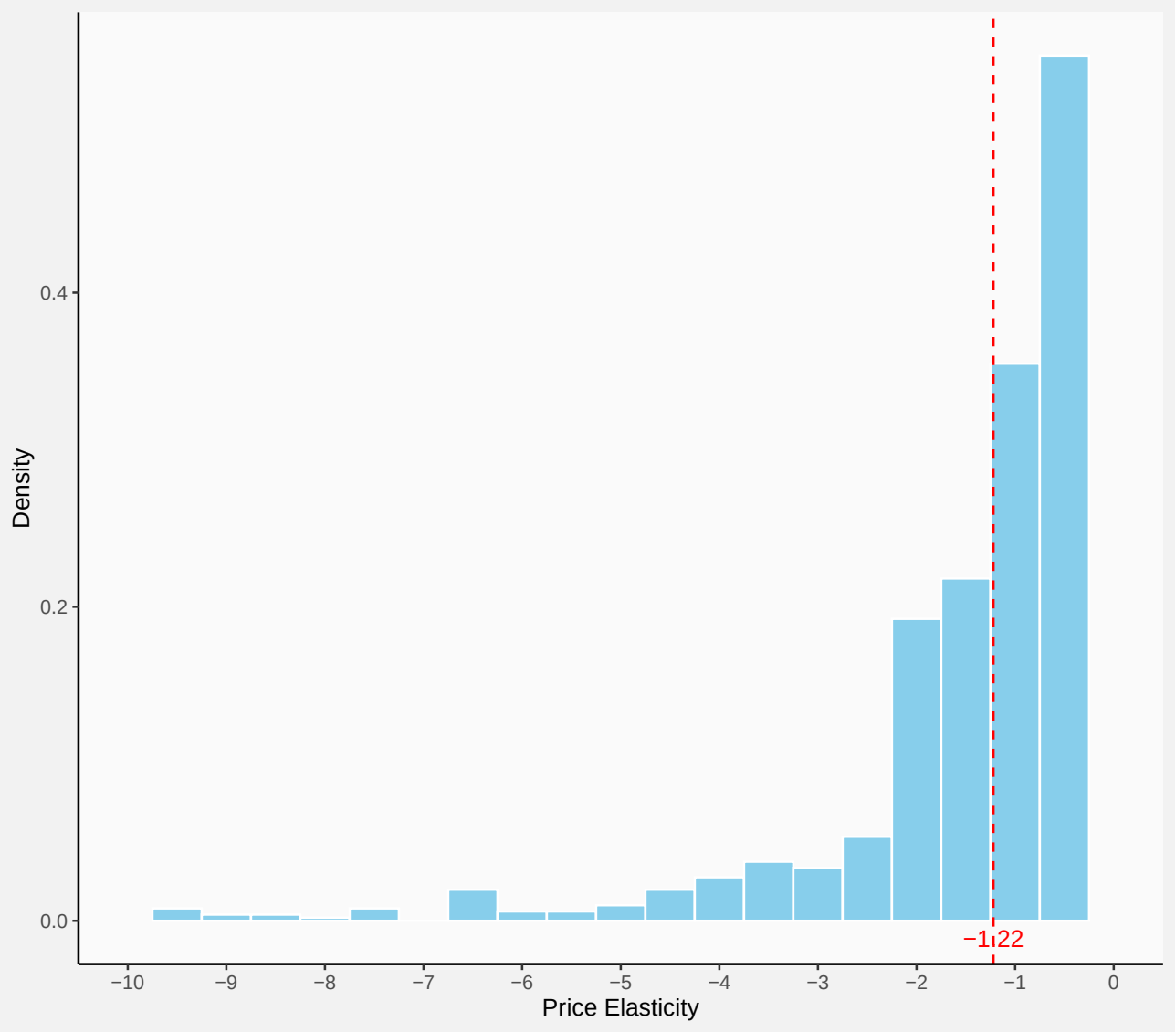


Figure 3: The distribution of the price elasticity without income effect

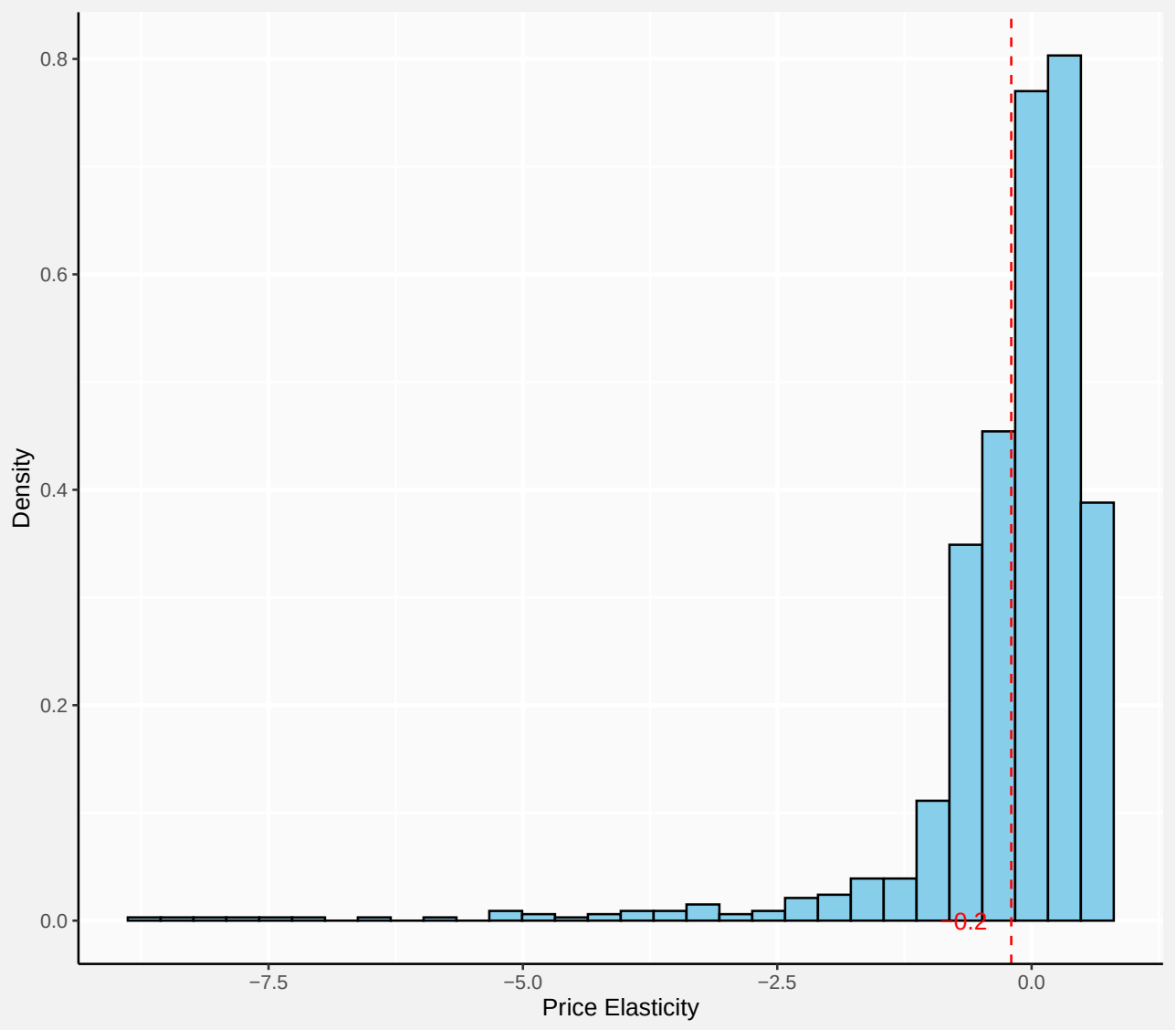


Figure 4: The distribution of the price elasticity with income effect

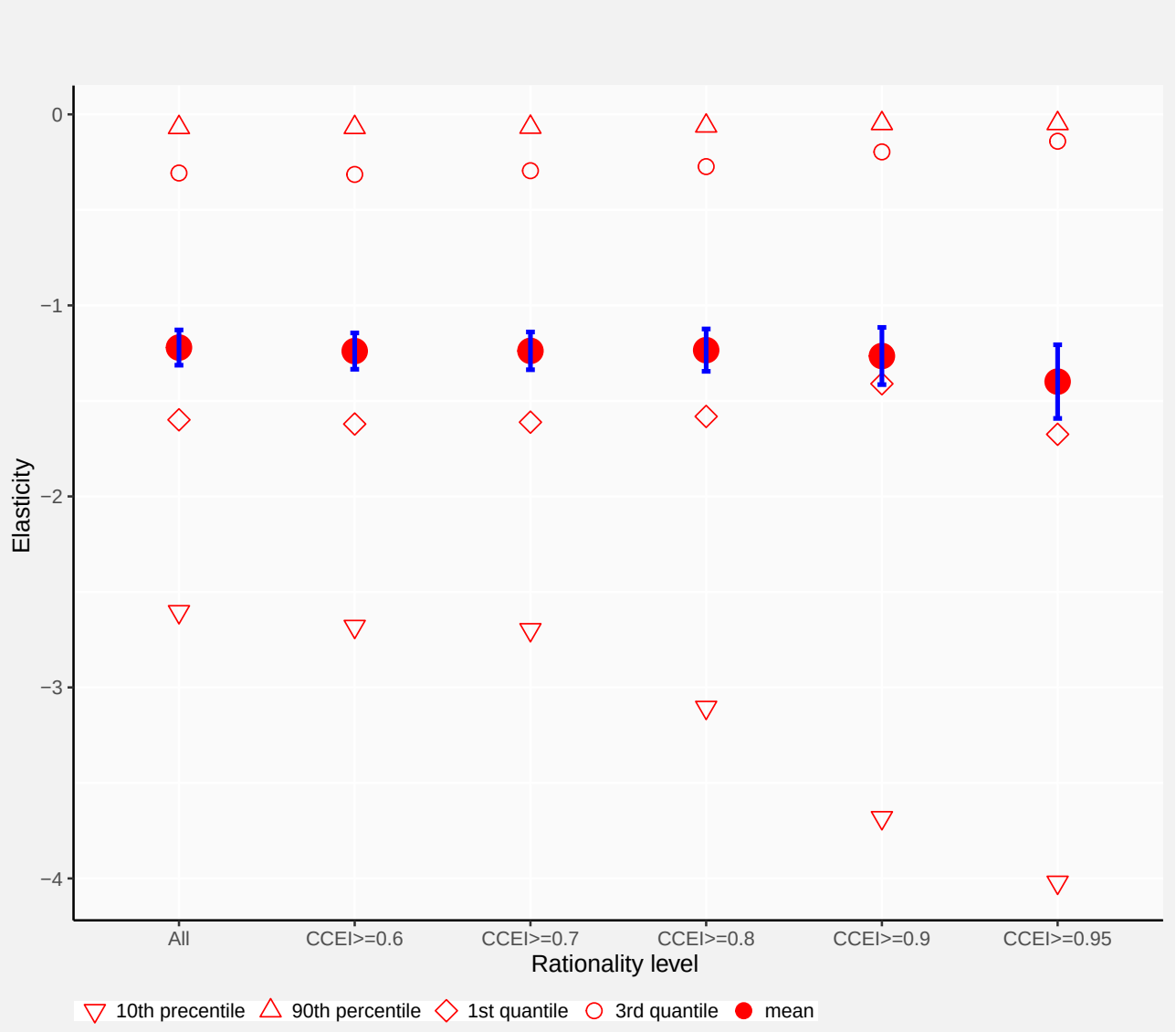


Figure 5: The distribution of the price elasticity across rationality levels

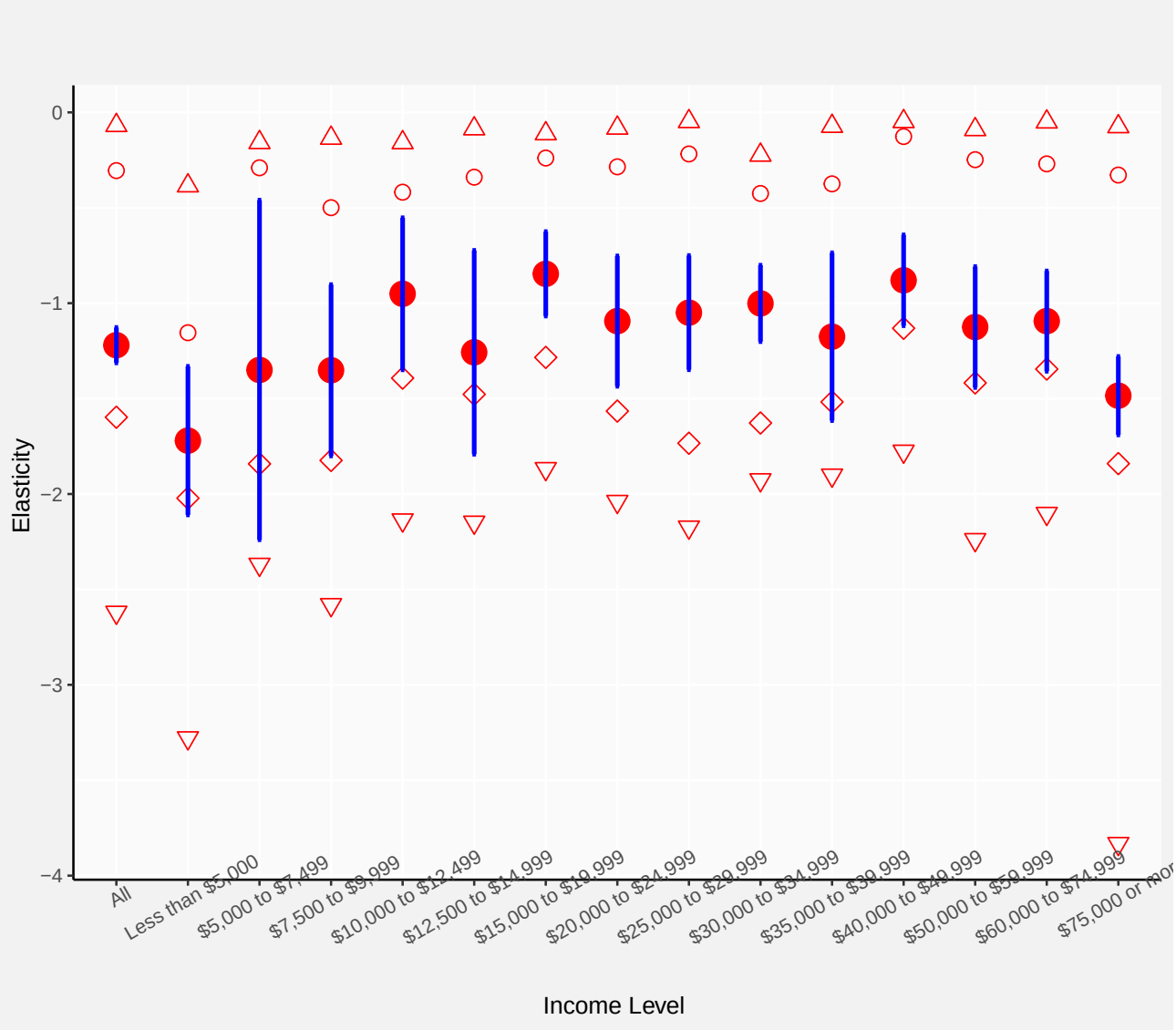


Figure 6: The distribution of the price elasticity across income levels

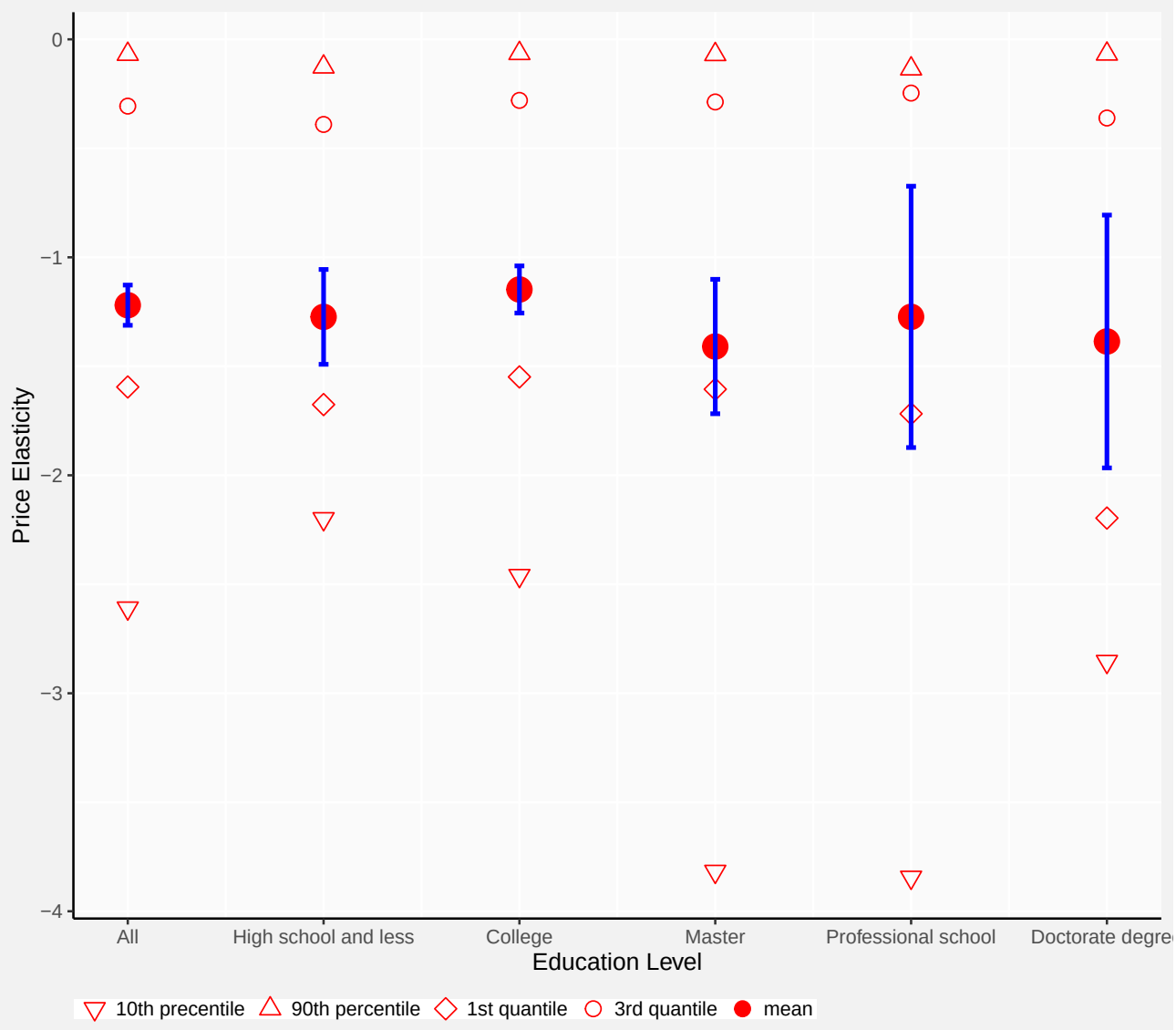


Figure 7: The distribution of the price elasticity across education levels

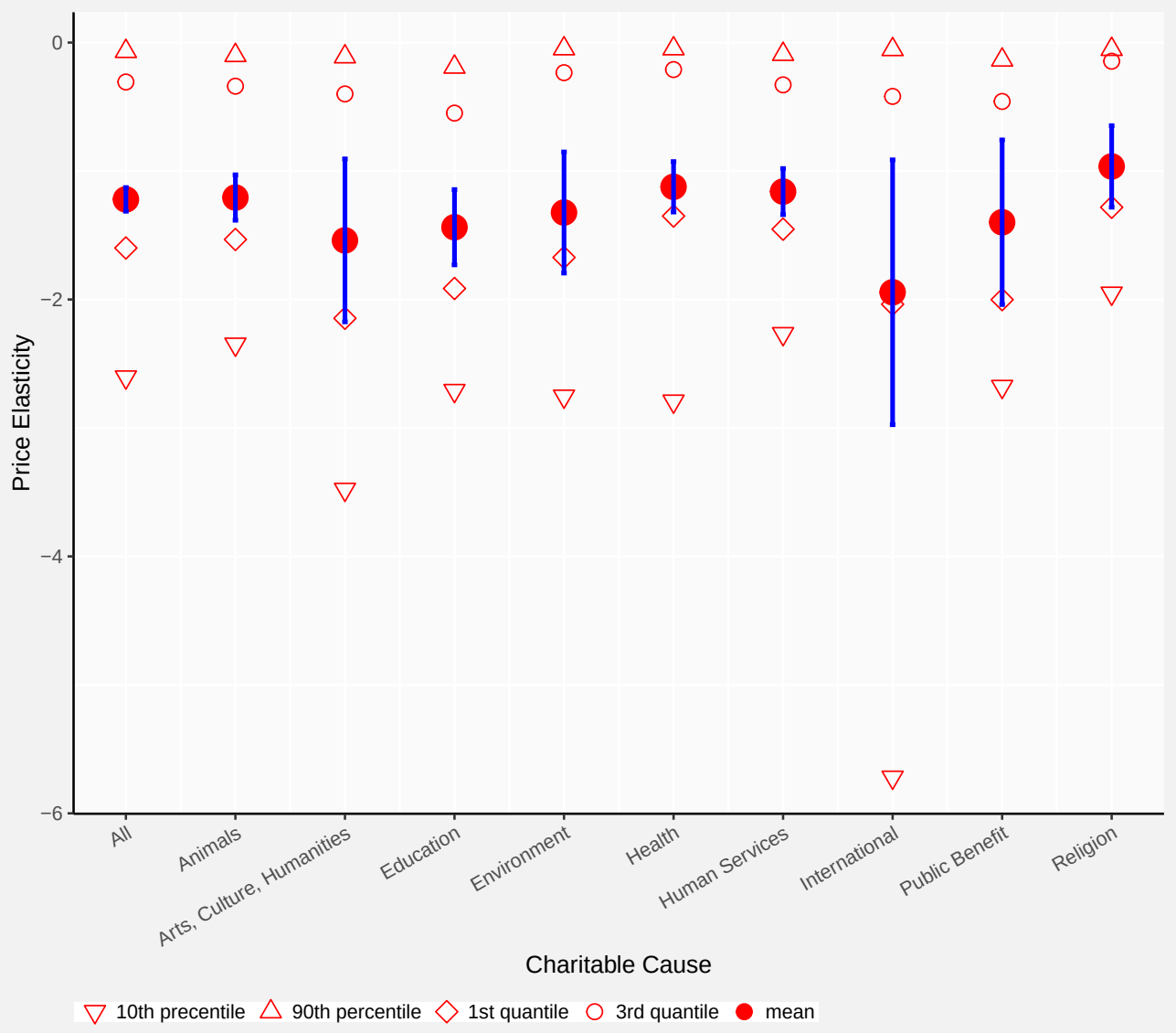


Figure 8: The distribution of the price elasticity across charitable causes

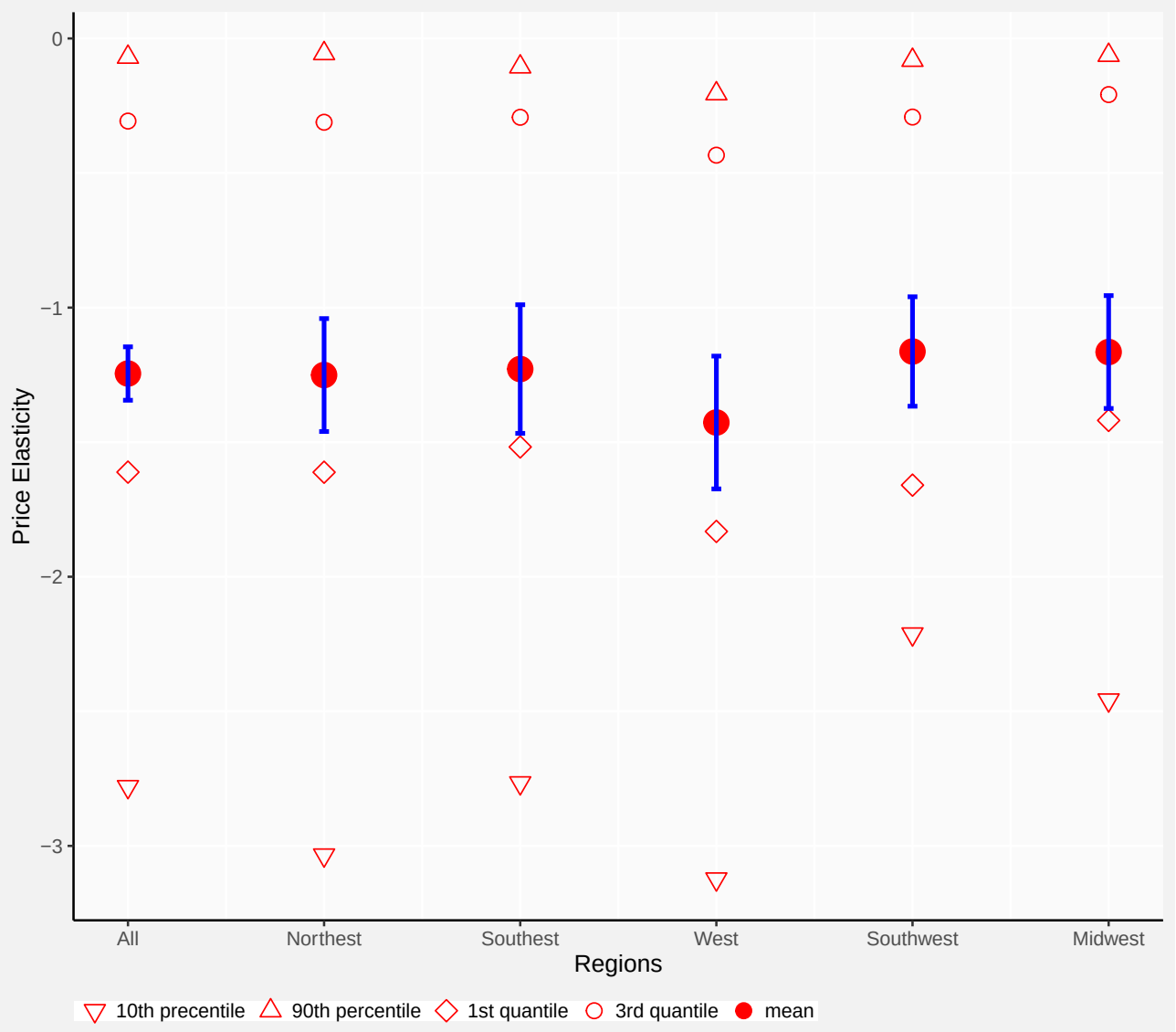


Figure 9: The distribution of the price elasticity across regions

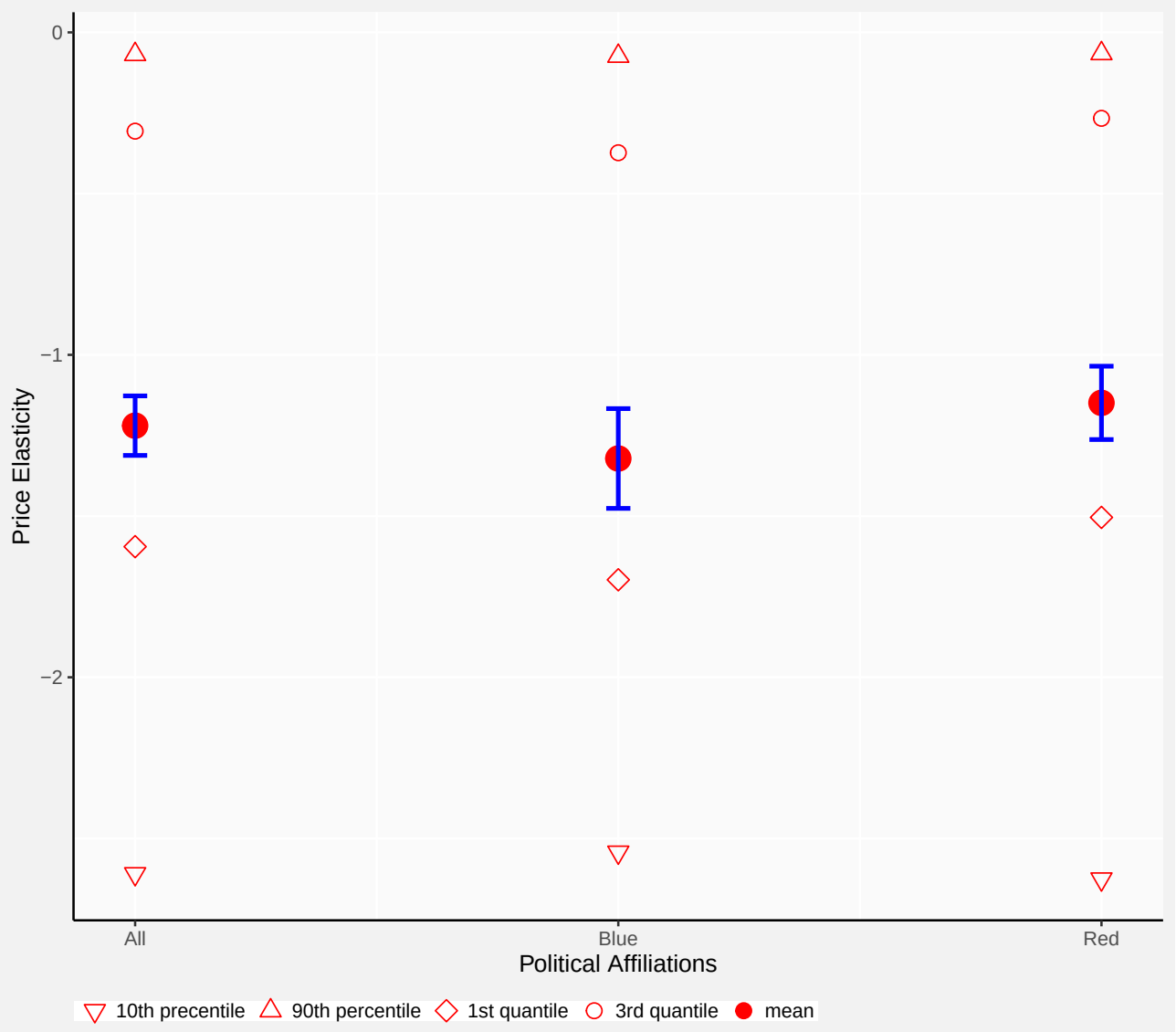


Figure 10: The distribution of the price elasticity across political affiliations

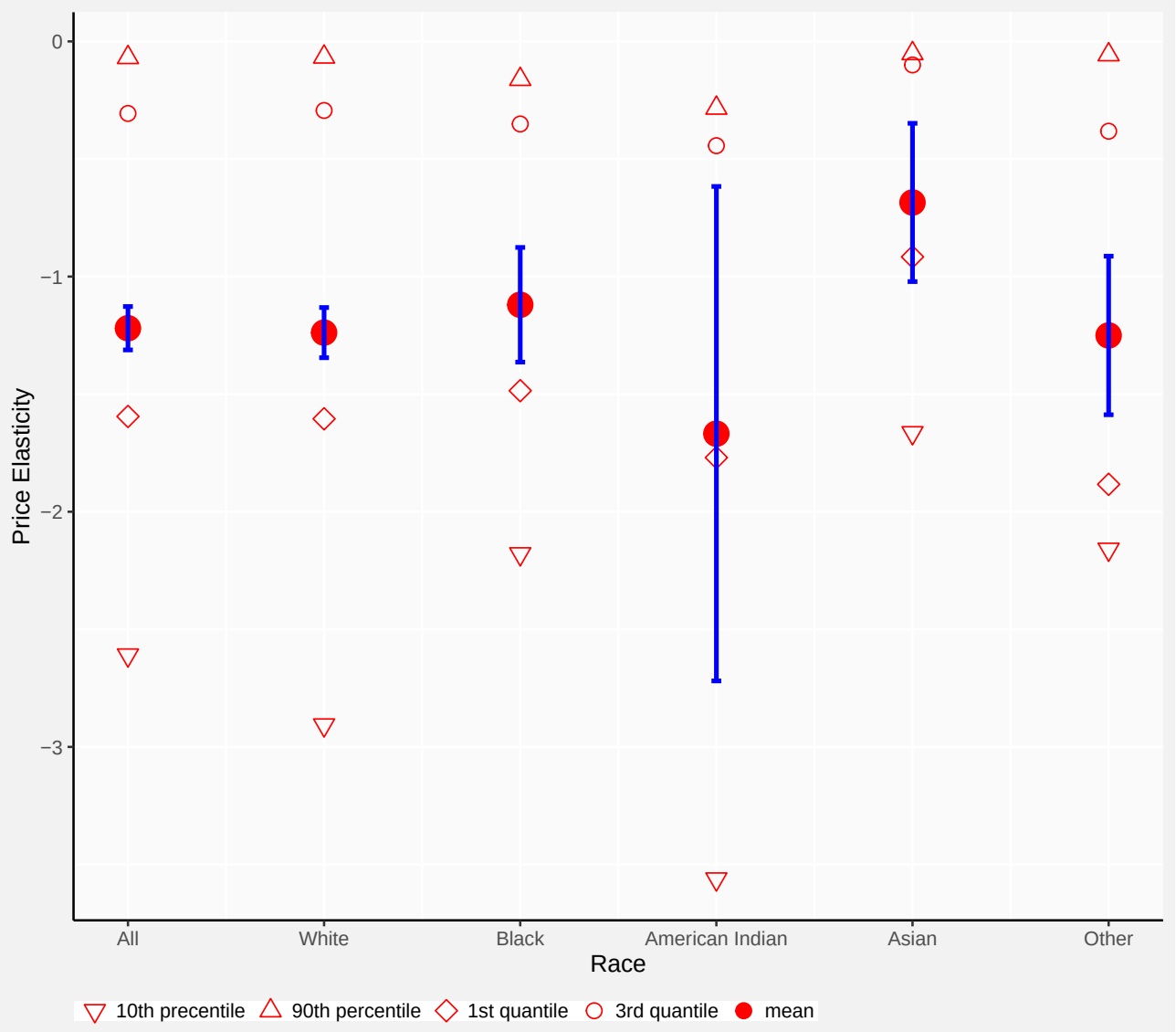


Figure 11: The distribution of the price elasticity across races

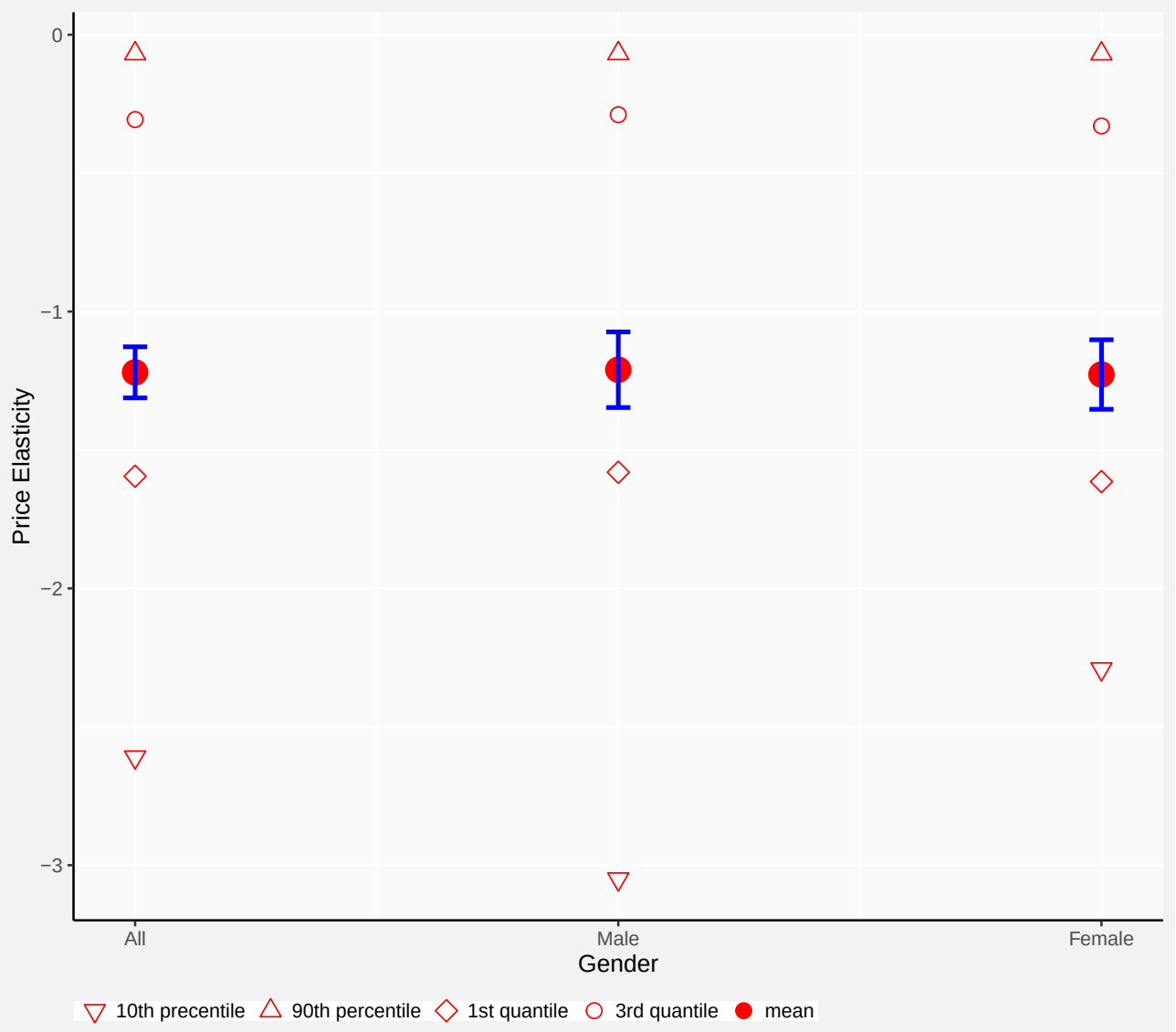


Figure 12: The distribution of the price elasticity across genders

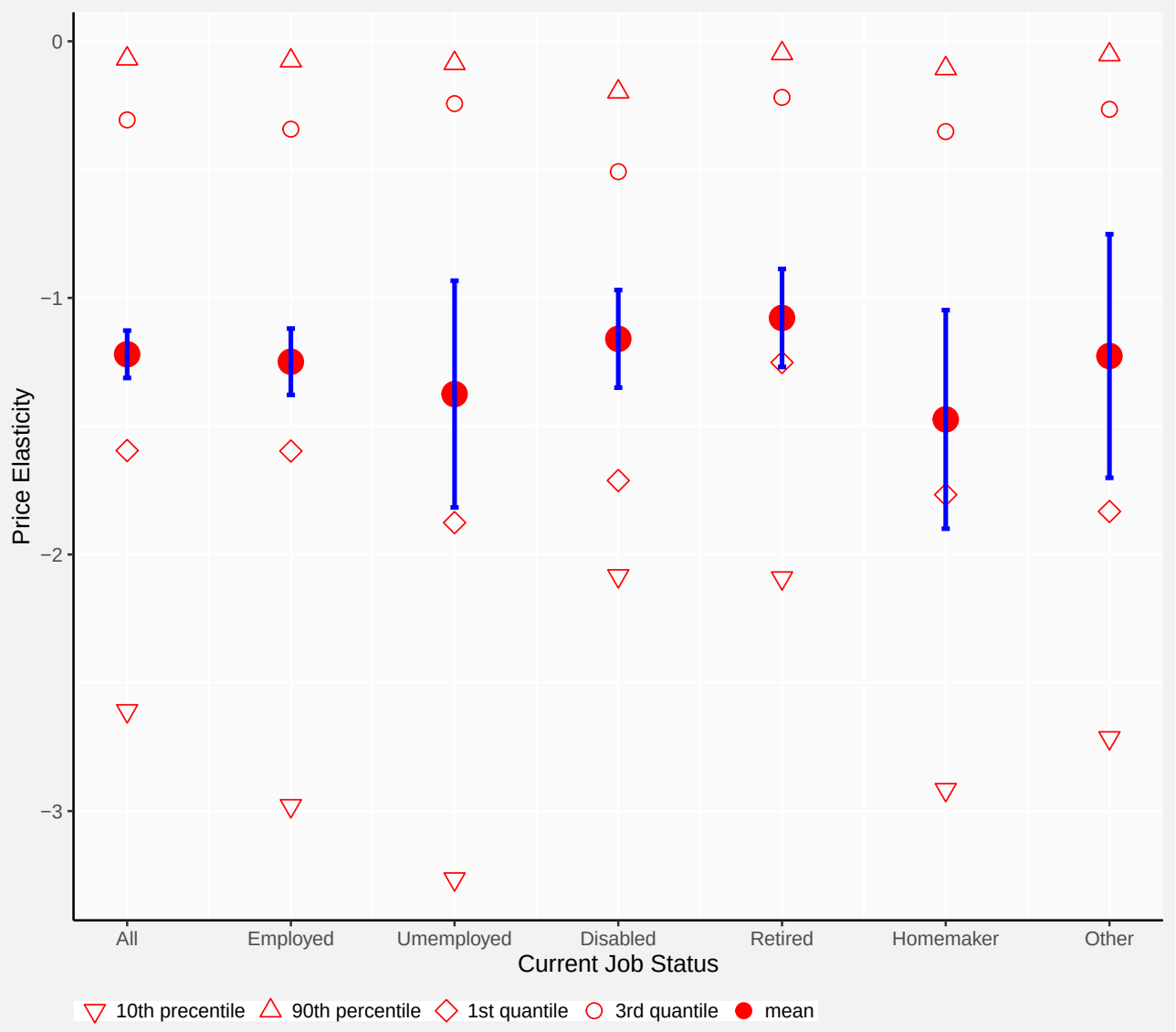


Figure 13: The distribution of the price elasticity across job statuses

Appendix A.Experimental Screens and Instructions

Instructions (TEXT ONLY)

Welcome to the survey

Login code:_____

Please remember that participation in this survey is voluntary and you may skip over any questions that you would prefer not to answer. You will not be identified in any reports on this study.

This is an experiment in decision-making. Your payoffs will depend partly on your decisions and partly on chance. Please pay careful attention to the instructions as a considerable amount of money is at stake.

During the experiment we will speak in terms of experimental tokens instead of dollars. Your payoffs will be calculated in terms of tokens and then translated into dollars at the end of the experiment at the following rate: **2 Tokens = 1 Dollar**.

You are free to stop at any time. If you do not complete the experiment now, you may return to complete the experimental session at any time between now and 04-01-2016. If you do not complete the experiment before then, you will not receive any payment. Details of how you will make decisions and receive payments will be provided below.

This is an experiment in two stages. For stage one, you will be presented with information on several charitable organizations taken from the website www.CharityNavigator.com; afterwards you will be asked to select a preferred organization.

In stage two you will participate repeatedly in 50 independent decision problems that share a common form. We next describe in detail the process that will be repeated in all decision problems and the computer program that you will use to make your decisions.

In each decision problem you will be asked to allocate tokens between yourself and the charitable organization you selected in the previous stage. We will refer to the tokens that you allocate to yourself as tokens that you **Hold**, and tokes that you allocate to the chosen charity as **Pass**.

Charity navigator is a website that evaluates organizations which rely on public support and actively solicit donations from the public. It rates organizations which file IRS Form 990 along several dimensions and has been acclaimed by numerous publications as among the best or most useful websites.

They have identified 9 charitable categories and several causes within each category. The table on the next screen is adapted from the charity navigator website and contains information on the top ten charities within each cause. Please review the information in this table carefully and select your most preferred charity. If you like, you can also write in a different

charity of your choice. The Charity I select is_____

Each choice will involve choosing a point on a line representing possible token allocations to you (**Hold**) and to your charity (**Pass**). In each choice, you may choose any Hold / Pass pair that is on the line. Examples of lines that you might face appear in the diagrams below. In each graph. **Hold** corresponds to the vertical axis and **Pass** corresponds to the horizontal axis. The points on the diagonal lines in the graphs represent possible token allocations to **Hold** (tokens to you) and **Pass** (tokens to the charity) that you might choose.

By picking a point on the diagonal line, you choose how many tokens to hold for yourself and how many to pass to the charity. You may select any allocation to **Hold** or **Pass** on that line.

If, for example, the diagonal line runs from 50 tokens on the **Hold** axis to 50 tokens on the **Pass** axis (See Diagram 4), you could choose to hold all 50 tokens for yourself or pass all 50 tokens to the charity.

To further illustrate, in the example below, choice A represents an allocation in which you hold y tokens and pass **x** tokens. Thus if you chose this allocation you will keep **y** tokens for yourself and pass **x** tokens to the charity. Another possible allocation is B, in which you hold **w** tokens and pass **z** to the charity.

Each of the 50 decision problems will start by having the computer select a diagonal line at random. All of the lines that the computer will select will intersect with at least one of the axes at 50 or more tokens, but will not intersect either axis at more than 100 tokens. The lines selected for you in different decision problems are independent of each other and depend solely upon chance.

The computer program dialog window is shown here. In each round, you will choose an allocation by using the mouse to move the pointer on the computer screen to the allocation that you wish to choose (note that the pointer does not need to be precisely on the diagonal line to shift the allocation). When you are ready to make your decision, left-click to enter your chosen allocation. After that, confirm your decision by clicking on the OK button. Note that you can choose only Hold and Pass combinations that are on the diagonal line. Once you have clicked the OK button, your decision cannot be revised. After you submit each choice, you will be asked to make another allocation in a different decision problem involving a different diagonal line representing possible allocations. Again, all decision problems are independent of each other. This process will be repeated until all 50 decision rounds are completed. At the end of the last round, you will be informed that the experiment has ended.

Next, you will have a practice decision round. The choices you make in this practice round will have no impact on the final payoffs to you or to the charity. In this round, you

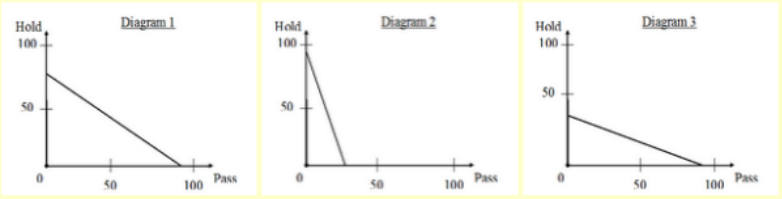
may choose any combination of tokens to Hold (tokens to you) and Pass (tokens to the charity) that are on the line. To choose an allocation, use the mouse to move the cursor on the computer screen to the allocation that you desire. When you are ready to make your practice choice, left-click to enter your chosen allocation. To revise your allocation in the first practice round, click the CANCEL button. To confirm your decision, click on the OK button. You will then be automatically moved to the second practice round. After you complete the practice round, click NEXT to proceed to the next screen.

Payoffs will be determined as follows: At the end of the experiment, the computer will randomly select one of the 50 decisions you made to carry out for real payoffs. You will receive the tokens you held in that round (the tokens allocated to Hold). Your selected charity will receive the tokens that you passed (the tokens allocated to Pass). Note that the charity you selected is not making any allocation decisions. At the end of last round, you will be informed of the round selected for payment, and your choice and payment for the round. At the end of the experiment, the tokens will be converted into money. Each token will be worth 0.50 dollars, and payoffs will be rounded up to the nearest cent. Recall that you are free to stop at any time, and you may return to complete the experimental session at any time between now and 04-01-2016. If you do not complete the experiment between now and 04-01-2016, neither you nor your selected charity will receive any payment.

To review, in every decision problem in this experiment, you will be asked to allocate tokens to Hold and Pass. At the end of the experiment, the computer will randomly select one of the 50 decision problems to carry out for payoffs. The round selected depends solely upon chance. You will then receive the number of tokens you allocated to Hold in the chosen round. The charity you selected will receive the number of tokens you allocated to Pass in the chosen round. Each token will be worth 50 cents. If everything is clear, you are ready to start. Please click NEXT to proceed to the actual experiment.

Experimental Screens

Each decision will involve choosing a point on a line representing possible token allocations to you (**Hold**) and to your charity (**Pass**). In each choice, you may choose any Hold / Pass pair that is on the line. Examples of lines that you might face appear in the diagrams below. In each graph **Hold** corresponds to the vertical axis and **Pass** corresponds to the horizontal axis. The points on the diagonal lines in the graphs represent possible token allocations to **Hold** (tokens to you) and **Pass** (tokens to the charity) that you might choose.



Please click the NEXT button below to proceed to the next screen.

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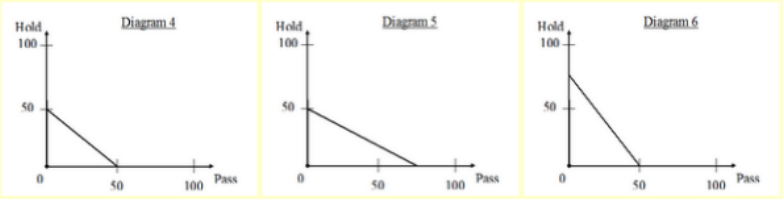
RAND American Life Panel

By picking a point on the diagonal line, you choose how many tokens to hold for yourself and how many to pass to the charity. You may select any allocation to **Hold** and **Pass** on that line.

If, for example, the diagonal line runs from 50 tokens on the **Hold** axis to 50 tokens on the **Pass** axis (see Diagram 4), you could choose to hold all 50 tokens for yourself, or pass all 50 tokens to the charity, or anything in between.

However, most of the decision problems will involve flatter or steeper lines: if the line is flatter (see Diagram 5), one less token for yourself means *more than* one additional token is passed to the charity; if the line is steeper (see Diagram 6), one less token held means *less than* one additional token passed to the charity.



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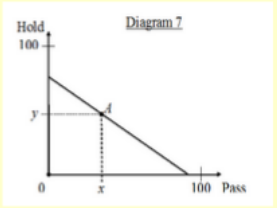
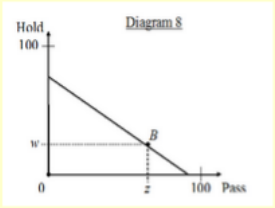
RAND American Life Panel

To further illustrate, in the example below, choice A represents an allocation in which you hold **y** tokens and pass **x** tokens. Thus, if you choose this allocation, you will hold **y** tokens for yourself and you will pass **x** tokens to the charity. Another possible allocation is B, in which you hold **w** tokens and pass **z** tokens to the charity.





Please click the NEXT button below to proceed to the next screen.

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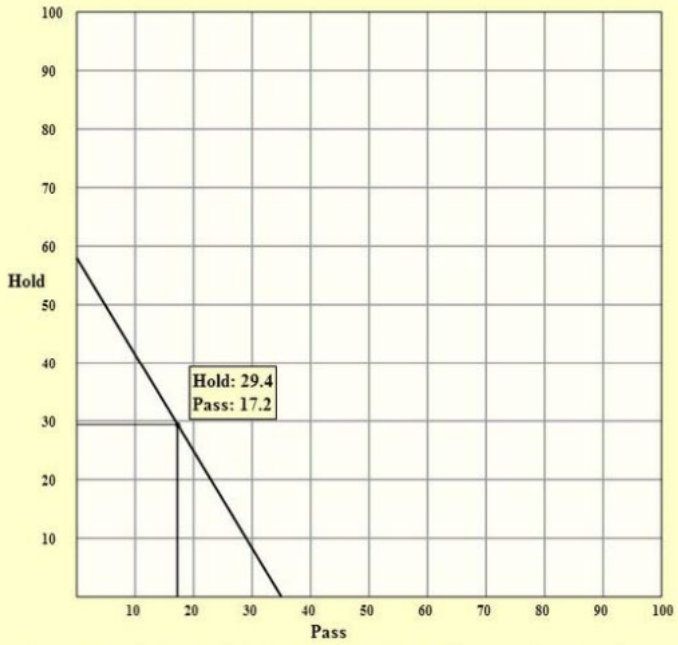
RAND American Life Panel

The computer program dialog window is shown here. In each round, you will choose an allocation by using the mouse to move the pointer on the computer screen to the allocation that you wish to choose (note that the pointer does not need to be precisely *on* the diagonal line to shift the allocation).

When you are ready to make your decision, left-click to enter your chosen allocation. After that, confirm your decision by clicking on the OK button. Note that you can choose only **Hold** and **Pass** combinations that are on the diagonal line. Once you have clicked the OK button, your decision cannot be revised.

Round 1 of 50



After you submit each choice, you will be asked to make another allocation in a different decision problem involving a different diagonal line representing possible allocations. Again, all decision problems are independent of each other. This process will be repeated until all 50 decision rounds are completed. At the end of the last round, you will be informed that the experiment has ended.

Please click the NEXT button below to proceed to the next screen.

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RAND American Life

Next, you will have two practice decision rounds. The choices you make in these practice rounds will have no impact on the final payoffs to you or to the other ALP respondent. In each round, you may choose any combination of tokens to **Hold** (tokens to you) and **Pass** (tokens to the charity) that are on the line. To choose an allocation, use the mouse to move the cursor on the computer screen to the allocation that you desire.

When you are ready to make your first practice choice, left-click to enter your chosen allocation. To revise your allocation in the first practice round, click the CANCEL button. To confirm your decision, click on the OK button. You will then be automatically moved to the second practice round. After you complete the two practice rounds, click NEXT to proceed to the next screen.

Please click the NEXT button below to enter the first practice round.

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RAND American Life Panel