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Why do Individuals Contribute to Public Radio?

Jose Asturias
University of Pennsylvania

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Introduction

The benefits of many public goods—traditionally defined as being non-rival and non-excludable—are available to one and all nominally at no expense. That situation notwithstanding, millions of dollars are given voluntarily every year by private citizens to support those very services.

The puzzle has long baffled economists. Why do individuals donate money to public goods whose benefits they can equally consume without contributing? The facts do not conform to theories of self-interested utility maximization of individuals. Clearly, any amount donated by an individual out of his finite income is at the expense of his own overall consumption. The resulting reduction in consumption implies a decrease in utility, making *giving* the less attractive of the two choices.

Yet, paradoxically, charitable donations are huge: nearly $250 billion, or roughly 2% of GDP in 2004 (Giving USA, 2005). Moreover, many institutions, ranging from public radio to the Red Cross, depend on this source of income for a large part of their funding. If consumers are not maximizing self-interested utility, then what are they maximizing? This paper addresses the question through data collected in a public radio donation drive. As a non-rival and non-excludable public good that citizens actively fund, the institution of public radio offers a unique opportunity to collect data on the motivation behind the phenomenon.

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Background

      Economists have developed a body of literature over the last decades that attempts to explain charitable giving. Conscious that narrowly tying utility to consumption has failed to produce a good answer, these studies include other preferences.

      The theory of altruism (Becker, 1974) holds that individuals naturally want to improve the well-being of others. Becker's model describes a person's utility function as $U(x, y)$ where x measures an individual's private consumption and y measures the well-being of recipients of charity. The person wants to see others in society better off; as a result, a rational person will donate when the loss in utility from his reduction in private consumption is smaller than the gain in his utility as a result of others increased happiness. Much literature has been written challenging this theory. Sugden (1982, 1984) finds properties that contradict empirical findings. The most glaring problem with this model is the implication that if other donors increase their donations, an individual will decrease his own donations (see Sugden, 1982, page 346). As described later, a large body of empirical analysis contradicts this result.

      Warm-glow, a alternative theory proposed by Andreoni (1990), asserts that in addition to interdependent utility functions, the act of giving increases an individual's utility. Andreoni's model describes a person's utility function as $U(x, g, G)$ where x is private consumption, g is the gift to the public good, and $G = \sum g_i$ is the total size of the public good. This general form also permits two other cases. The first is when the person is purely altruistic and does not care about the gift. Hence, his utility will be of a form $U(x, G)$. The second is when the person is motivated only by the act of giving, or warm

glow. Hence, the utility will be U(x, g). If the utility function contains x, g, and G then the person is impurely altruistic.

Andreoni (1995) conducted a laboratory experiment that found that people are significantly more willing to donate if appeals are framed as positive externalities and not negative externalities. In other words, individuals are more likely to donate if those who request donations focus on the positive results of donating rather than the misfortunes that would occur if individual did not donate. This has implications in favor of the "warm-glow" model. The motivation at work, Andreoni notes, cannot be pure altruism, for under that theory individuals would behave in the same way regardless of the appeal's positive or negative thrust. He explains, "This indicates that much of the cooperation observed in public goods experiments is due to framing, and that the warm-glow of creating a positive externality appears to be stronger than the cold-prickle of creating a negative externality."

Implicit in this analysis is the pivotal role of framing in determining how individuals feel about giving and even about whether they experience warm-glow or not. The existence of an asymmetry in how people donate depending on the focus of the advertising shows the importance of framing. This shows that individuals receive different amounts of enjoyment from donating under different circumstances, with some sort of warm-glow phenomenon evidently at work.

Other theories concentrate on pro-social behavior focus and conditional cooperation—the notion that individuals are more likely to contribute when others contribute. Multiple empirical studies confirm that conditional cooperation strongly influences donations. List and Lucking-Reiley (2002) found that increasing seed money

significantly boosted participation rates and average gift size. More specifically, increasing seed money from 10 percent to 67 percent of the campaign goal produced a nearly six-fold increase in contributions, with significant effects of both participation rates and average gift size.

Frey and Meier (2004) conducted a field experiment at the University of Zurich during an annual fundraiser to benefit student financial aid programs. Some students were presented with information that a relatively high percentage of the student population (64 percent) contributed whereas another group was given information that a relatively low percentage had donated (46 percent). Using a conditional logit model to analyze the results, the researchers estimated that a change in expectations from 46 percent to 64 percent increases the probability of contributing for an individual by around 11.5 percentage points.

Shang and Croson (2004a), (2004b), (2005c) and Shang, Croson and Reed (2005) confirmed these findings in the context of public radio. In these series of field experiments, operators at a public radio station described donation sizes of prior callers. There was also a control group in which the operator did not mention any amount. The studies found that if the amount indicated by the operator was $300 (94 percentile) then contributions by new members increased by about $52 or 43% as compared to the control group. Only when the amount in the operator's prompt was above the 99th percentile, the studies found, did individuals not increase their donations.

This behavior of conditional cooperation is consistent with multiple theoretical frameworks. First, Sugden (1984) proposed the theory of reciprocity. It rests on the idea of "practical morality," which sustains that individuals attempt to maximize their own

consumption only within certain moral bounds. In this case, it means that an individual will feel morally bound to donate to a public good if many other individuals are donating as well.

Rabin (1993) develops another interesting theory that could shed light on this "practical morality" of Sugden's. Why do individuals feel morally obligated to donate when many others are donating? This theory holds that individuals tend to respond to generous acts, even if it is costly to them. Individuals do not always necessarily want to be generous to everyone as Becker's altruism would suggest. In short, individuals will not be charitable to all; rather, they will do so according to the generosity of the other person.

To some theorists, charity can take the form of a transaction: "you give me something nice and I give you something nice back." What the donor receives can vary widely, and need not take tangible form. It can simply be what we might broadly call a service. Its thrust could be practical, emotional, esthetic, etc. Regardless of its form and other particulars, it will always be something the recipient enjoys and/or values. Hence, we would expect increased donations from increased usage under this theory. In addition, if many others are donating money, then the individual may see this as a gift and hence increase his own donations. Thus, this theory is also consistent with reciprocity.

Transactions can specifically involve an exchange of gifts, a formula analyzed by several empirical studies. Falk (2003) compared contribution levels when gifts were and were not included in letters requesting donations, finding that small gifts increased contributions by 17 percent and large ones by 75 percent. This finding, Falk (2003)

notes, may also shed light on the results found by List and Lucking-Reiley (2002). The reason that increasing seed money significantly boosted participation rates and average gift size, Falk observes, could be that individuals see seed money as a gift that is reciprocated with higher donation rates. Hence, even under the gift-exchange hypothesis, we would still expect to see a higher donation when others increase their own donations as well, which is consistent with reciprocity.

Another possible theory, that of "social norms" (Bernheim, 1994), may also shed light on conditional cooperation. Because a person's status within a group is determined by his adherence to its social norms, Bernheim theorizes that in gift-giving people have an eye on their social status in addition to being concerned about the utility they derive directly from consumption (the author calls this "intrinsic" utility). Hence, when status is sufficiently important relative to "intrinsic" utility, individuals will choose to give up some of their own consumption in order to gain social status or avoid chastisement from the group. In fact, psychological, anthropological, and sociological research has shown that often individuals who do not follow norms will be socially chastised.

Festinger (1954) proposed the theory of social comparisons, one that is both consistent with reciprocity and social norms. In that theory, people look towards the behavior of other people in order to provide information on the appropriate behavior to follow. Once this information has been given, we can expect individuals to gravitate towards this behavior.

Social comparisons appear to be part of a larger phenomenon observed in marketing: the "anchor point" or "reference point" (Desmet, and Feinberg, 2003). Consumers have been found to avail themselves of anchor points to price products on a

relative rather than an absolute basis, thus revealing they want an indication of what they *ought* to pay for a product. Anchor points can be internal or external. Internal ones may come, for example, from prior experience or some preconceived notion of the consumer, while advertising is a common form of the external variant.

Desmet and Feinberg (2003) conducted a large-scale experiment as part of a French charity's national fundraising campaign to test the existence of these anchor points in a fundraising setting. The researchers manipulated the suggested donation sizes listed on solicitations. They found that different amounts (i.e., anchor points) led to very different distribution of donations. Regardless of whether individuals interpret these higher donation sizes as reflecting higher average donations or not, we still see that anchor points convey social information (in this case the amount expected from the charity), which influences donation sizes.

Vesterlund (2003) has focused on methods via which contributors identify which charities are of a high-enough quality to support. We have 600,000 charities, with an additional 30,000 added every year. Because of the sheer numbers involved, the author points out, there is a major lack of information regarding most charities. For the public, Vesterlund believes, large contributions equal broad-based support, which in turn equal a reputation for quality. Thus an organization's donation-based financing is taken by many donors as a reflection of its intrinsic quality. This can explain the common practice in fundraising campaigns of announcing large "leadership" contributions throughout the campaign. In addition, it could explain why many fundraising campaigns begin with a low-key effort in order to accumulate some seed money.

Potter (2001) conducted a laboratory experiment in order to test this hypothesis. In the first setting, only the first donor is given information regarding the quality of the public good. After his donation size is announced, the other subjects decide how much to donate. Researchers found that subsequent donors tended to follow the size of the first donor. In another experiment, the quality of the public good was announced to everybody. In this setting, announcing the first person's donation size had no effect on subsequent donation levels, showing evidence for the signaling hypothesis.

As this short review demonstrates, there are many proposed theories as to why individuals donate to public goods. Some can exist parallel to each other, while some are mutually exclusive. As more tests are conducted over time we will be able to identify the most credible.
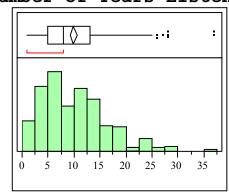
To briefly summarize the ground covered, altruism suggests that an individual donates because he receives satisfaction from improving other people's welfare, while warm-glow contends that an individual receives satisfaction from donating. Other theories focus on pro-social behavior and are consistent with conditional cooperation—that individuals are more likely to donate if others are donating. The exchange theory focuses on donations being triggered by the receipt of something the donors values or enjoys. Reciprocity suggests that if many people donate then a person will feel morally obligated to donate as well. A possible explanation may be that individuals try to respond to generous acts—if many other people are donating it may be seen as a gift that much be reciprocated with a higher donation. The theory of social norms suggests that in some circumstances individuals may give up their own consumption in order to follow a social norm. Hence, the person may donate in order to avoid social chastisement or

receive praise from others. Lastly, the quality hypothesis holds that large donations signals that the charity is of high quality.

Goals

With such a bewildering abundance of theories purporting to explain charitable behavior, any chance to test them against actual data is useful. This study will use survey data collected from individuals who gave to public radio in order to test these theories. Using a regression, we will assess which theory is most influential in determining donation sizes. From these results, we will be able to see which motivations are borne out by the findings, and their importance relative to each other.

Note should be made that Vesterlund's "quality" hypothesis (large contributions are a way of identifying high-quality organizations) cannot be tested in the setting of public radio. On the other hand, it is safe to assume that public radio donors already have all the information they need about it. As can be seen in the chart below, those who donate have listened to public radio for a considerable number of years. The median number of years is 8 and the middle 50% is 5-13 years. Thus, while this theory does hold much potential, it will not be tested in this paper.

Number of Years Listened

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Data

The data used in this paper was collected during the 2003 annual fundraiser of an east coast public radio station. This survey was enclosed in the renewal package sent to all renewing members. Those who responded filled out the survey at approximately the same time that they decided their donation amounts. These surveys were returned directly to the researchers in a separate envelope. See Appendix I for a copy of the survey. Note that the questions on all surveys were the same; however, the order of the questions varied to control for any differences posed by any one ordering. These differences did not turn out to be statistically significant.

The survey consisted of two parts. The first contained 21 questions that tried to elicit from the individuals the motivations for donating. For each listed motivation the individual indicated how well it matched his reason for donating by choosing a number ranging from 1 ("Not at all"), to 5 ("Very well"). Each of these questions was tied to a specific theory. For example, "I contribute because it feels good to contribute" attempted to identify individuals influenced by warm-glow. "To increase the quality of the service that other listeners get" corresponded to an altruistic motivation. These questions allow researchers to infer motivations for donating.

The 14 questions in Part II elicit data about the individual. Questions including listener usage, number of friends and family who also listen to public radio, estimated average contribution of other donors, number of other stations listened to, and other organizations the person donates to. Lastly, the donor was asked his sex, age, education, ethnicity, zip code, and relationship status in order to control for demographic differences across donors.

As an incentive to return the survey, a donation of $5 was promised to the first 200 responders. There was a response rate of 14%, or 423 individuals. All the information collected from the survey was then linked the individual's donation history. Hence, the dataset contains motivations for donating and the amount donated, in addition to demographic data.

The advantage of using a survey is that it provides data of different types to test many different theories. Do donation sizes increase as the estimated average donation increase as implied by conditional cooperation? Do individuals with friends that listen tend to donate more money, as "social norms" indicates? These different theories can be tested using this survey. In addition, it allows for the easy collection of demographic data to control for other factors.

The main criticism of using surveys is the possibility of inaccurate data. All pollsters know that some questions test better than others, for people's wish to meet presumed expectations gets in the way of their truthfulness. For example, in this sample it was found that individuals tend to overestimate the amount they donated. So it seems reasonable to assume some inaccurate reporting when data that could be used to "judge" the person is being collected. On the other hand, a large segment of the questions did not ask for this kind of data. A person has little reason to lie, for instance, if he is being asked for the reasons he contributes.

Another potential problem is that of noisy data, which is prevalent in survey information. The results will be that the alternative hypothesis (that a regressor has some predictive power) will be rejected too often (see Appendix II). A possible remedy of this

problem may be to use instrument variables, although this issue will not be addressed in this paper.

A much larger concern is whether the sample is iid across individuals. The fact that only 14% of those surveyed responded is not in itself problematic, for national election polls estimate the voting patters of over 100 million people using a sample of only a couple hundred persons. The question is whether the 14% that responded is representative of the contributors to public radio. One possible way in which to address this issue is to compare the demographic of those who responded to the survey and the general donating population. This analysis would give a fairly good idea if there is a very large bias.

That said, the limited participation in this survey places some restrictions on its uses. The small number of people questioned in national polls is chosen by the pollsters, while here the participants selected themselves. What distortions this fact might cause are impossible to predict. Despite this problem, there is still much insight we can still glean from this data.

General Description of Participant Data

Approximately 75% of individuals indicated an age between 35 and 54. Over 90% attended college and 77% graduated. 96% identified themselves as white. Individuals reported listening an average of 3 hours per day and tuning in to an average of 1.8 other stations. The average and median donation sizes over three years (actual donations, not self-reported) were $109 and $82. The average and median of the estimated donation of other contributors were $83 and $67. In addition, the average

individual knew 6 others who listened. However, the average individual only knew 1.5 other people who actually contributed.

Preparing for the Regression

The aim of this project is understand the motivations for individuals to donate to public radio. Using a regression, we can assess which types of individuals tend to donate money to public radio while controlling for many factors. We will regress average contributions (actual contributions, not self-reported) on the questions from the survey.
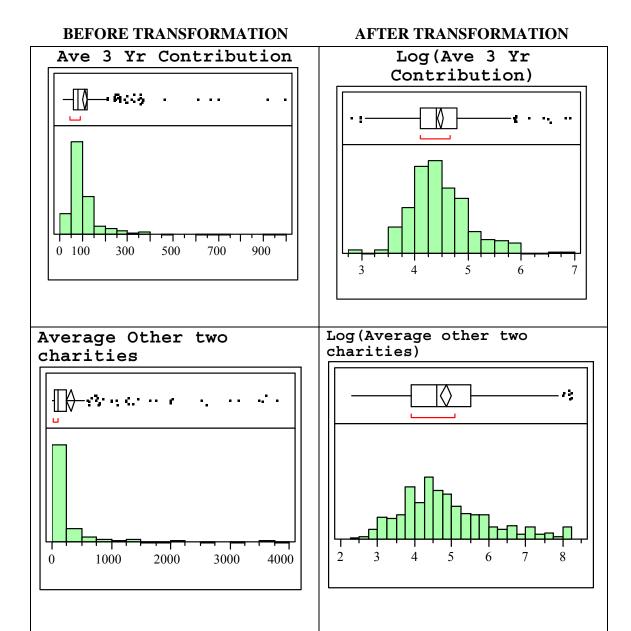
One of the first issues was choosing the dependent variable of the regression. The average 3 year contribution of the individual was chosen. By taking the average over 3 years, we ensured that the data provided a more accurate view of the person's donation patterns that just taking the latest year's donation size. Implicit in this assumption is that the person donates a certain mean plus epsilon where epsilon is a random term, with mean zero. By taking the average over a couple of years we have a better idea of the true average.

Next, it was necessary to choose the independent variables. The data from the first half of the survey, the part that asked the individual to rate different reasons for donating 1-5, could be handled in two potential ways. The first was to simply let each question be a dependent variable. The second method was to create indexes for each motivation. In the survey, there were some questions that were worded differently but corresponded to the same motivation. Using a correlation table and the survey one could identify which questions tapped into the same psychological motivation. An index could then be created taking the average response corresponding to each motivation.

This first method was used instead of the second. It seemed that taking the average of these measures to create the index arbitrarily assigned weights to them. If there were two questions that corresponded to one theory, then each one received a 50% weight without taking into account any intrinsic or statistical reason. In addition, by running a regression on all the responses, only the strongest overall variables would remain in the regression, providing a more accurate measure.

The other dependent variables were the remaining questions asked in the survey, including data about the number of friends/family members who listen, usage data, and demographic data.

Some steps needed to be taken in order to prepare the data for the regression. First, it was necessary to transform the data when necessary to remove outliers and to create a normal distribution. This was done by logging the average 3 year contribution (the dependent variable) and average amount given to other two charities (an independent variable). These transformations can be seen in the graphs below.

BEFORE TRANSFORMATION	AFTER TRANSFORMATION
Ave 3 Yr Contribution	**Log(Ave 3 Yr Contribution)**
Average Other two charities	**Log(Average other two charities)**

In addition the term "average amount given to other two charities" also had one extreme outlier that posed a problem despite the log transformation. In order to avoid the potential skewing of our results, that one data point was removed from the regression.

Furthermore, the raw data that came from the first part of the survey was problematic; simply entering the data into the regression would have ignored that some individuals tended to give higher marks to all motivations than others. Hence, to correct

for this problem, the average mark for each individual was calculated and then all the responses were subtracted from this average. In this manner, all individuals' marks were "standardized" to make interpretation possible.
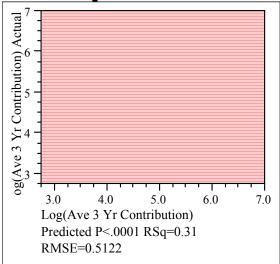
One criticism of this method may be that it only preserves the ordering of preferences but not necessarily the intensity of those preferences. For example, two individuals may have the same "standardized" preferences but different levels of intensity. Under this method they would both appear to be identical, resulting in a problem that cannot easily be overcome. The problem comes from the fact that it is hard, if not impossible, to distinguish between the intensity of these emotions and the arbitrary response tendencies of each person. Hence, it is argued that the only information that can be extracted from the data is the relative ranking of these preferences.

Regression Output

In order to arrive at the regression, the Log (three year average contribution) was regressed on all of the answers from the survey. All factors that were insignificant at the 5% level were removed.

Another important fact to note is that the correlation among the regressors is fairly low (see Appendix IV). In fact, the highest correlation is 0.25, which does not show much cause for concern.

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Actual by Predicted Plot

Predicted P<.0001 RSq=0.31
RMSE=0.5122

Goodness of Fit

R^2	0.313
R^2 Adjusted	0.288

Conditional Cooperation	**Coefficient**	**St. Error**
Estimated average donation	0.0057	(0.0011)
Social Norms		
Because friends donate	-0.084	(0.041)
I like others seeing my logo merchandise	-0.113	(0.034)
I feel obligated	-0.066	(0.030)
Altruism		
Listeners same quality	-0.069	(0.032)
Transactional		
Thank you gifts	0.076	(0.029)
Number of other stations	-0.110	(0.029)
To make sure that I will get the same quality service	-0.093	(0.035)
Warm Glow		
Log (Average donation to other charities)	0.185	(0.026)
Other Controls		
Female	-0.219	(0.067)

Using the outlined strategy above yielded a regression with an adjusted R^2 of 0.288. This is a fairly high R^2 considering that this is cross sectional data. Hence, a fairly significant portion of the variation in donation sizes can be explained by the answers from the survey.

One of the most significant factors of the regression is the estimated average donation. The correct interpretation of this coefficient is that an increase of $1 in the estimated average donation implies a (100*0.0057)% change in the average 3 year contribution, where 0.0057 is the term's coefficient. Suppose that an individual donates $100 and believes that the average donation is also $100. If his estimated average donation increases by $1 to $101, he will on average done $0.57 more. This term is extremely significant ($p < 0.01$) shows much explanatory power. This result confirms theories of conditional cooperation in which individuals are more likely to contribute if they think that others are contributing as well.[1]

Another interesting finding is that social norms proved to be a relatively weak influencer of donation sizes, reflected by the negative coefficients in the regression. It is important to note that negative coefficients should not be interpreted as a motivation having negative influence on an absolute scale. The scores for each motivation were "standardized" and are hence a measure people's preferences on a relative basis. The correct interpretation of a negative coefficient is that those who are influenced by a certain motivation tend to donate less money than those who prefer other motivations. Hence, those individuals who ranked highly the questions relating to social norms tended to donate less money on average than those who ranked it low. In addition, the fact that

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[1] Another possible explanation is that individuals use their own contributions to estimate the contributions of others. This issue was addressed by Frey and Meier (2004), p. 1717.

all three of these measures were negative provides more compelling evidence for this conclusion.

This conclusion seems to be consistent with the environment in which public radio operates. Its listeners are scattered throughout the region, making it difficult to establish social penalties for deviating from the norm. In fact, as indicated earlier, the average individual indicated knowing 6 people who listened but only 1.5 people who contributed. In this case, the average individual knows *more* people who *did not* donate than otherwise. A perception of social penalties for non-giving is doubtful.

Another possibility may be the presence of a positive element--that individuals do not get penalized for not donating but receive praise for donating. As the average contributor knows of only 6 other individuals who listen, this seems unlikely. It still leaves an extremely large percentage of people who may not even know about public radio. This fact is confirmed by the significant and negative term for the response: "because I like others seeing my logo merchandise." This motivation of social norms may be stronger in "sexier" charities that are supported by movie stars and famous musicians. Conceivably, wearing a shirt from a Bono-supported charity is likelier to garner praise than wearing a bag with a public radio logo.

The fact that "social norms" does not seem to be a powerful influencer in public radio donations is confirmed by the average scores to the motivations: "because my friends contribute" and "because I like it when other people see my logo merchandise." As can be seen in Appendix III their average scores were 1.58 and 1.75 respectively, and the average mark was 3.23. We can see that most donors do not consider this to be a major factor in donating.

The term that corresponded to altruism was also negative. Again, this means that individuals who rated altruism highly tended to donate less money, showing that high levels of altruism do not greatly increase donation sizes. This fact is consistent with past literature showing this theory to be inconsistent with empirical data.

Another theory tested was whether charity could be seen as a transaction or as an exchange of gifts. The term for thank you gifts came out to be positive, showing that those highly motivated by the receipt of a gift tended to donate more. By the same token, in such an exchange, two transactions are at play. That donation could, in theory, be divided into the amount being given in exchange for use of the service, and that being offered in exchange for the gift. The first can be thought of as traditional exchange, while in the second the donor is paying a certain amount for the merchandise. One way to see how much money donors are paying for the gift itself would be to remove the presents and see how much the people then donate.

The number of stations that the individual listened to also showed a negative coefficient, meaning that those who listened to more stations donated less money. This is also consistent with charity as a transaction. The less sense donors had of receiving a meaningful service from public radio, the less they gave, and visa versa. We can interpret the number of stations an individual listens to as a proxy for the value that he places on public radio: the more stations a person listens to, the less he values public radio. Under the transaction hypothesis if he values public radio less he will see his consumption as a smaller gift, hence donating less.

Both of these results are consistent with Falk's (2003) view of charity as gift exchange. In Falk's study for example, it was seen that if small gifts were enclosed in

solicitations for donations, people were be more likely to give money. In our current case, individuals received the "gift" of being able to listen to public radio. Donors gave a gift in return to the radio station. Lastly, the radio station gave the donor a gift for their contribution.

The last significant term with a transactional aspect is the motivation, "To make sure that I will get the same quality service." Again, the negative coefficient indicates that those who rated this highly relative to other motivations did not donate as much money. This result appears to be logical since contributors know that their contribution alone is not going to raise the quality of service. Hence, seeing donations as a transaction in this sense—a person donates in the belief that they will receive higher quality in exchange—does not hold up intuitively or in the data.
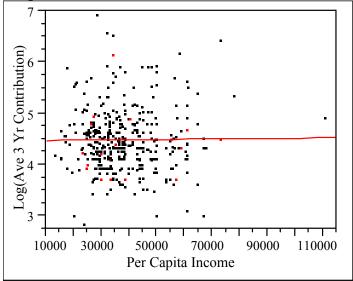
The term with the most explanatory power in the regression was the individual's average donations to other charities. As stated previously, it was necessary to transform the average donation to other charities in order to remove the outliers and create a normal distribution. Because both independent and dependent variable are log-transformed, a 1% change in average donation to two other charities results in 0.185% change in average 3 year contribution, where 0.185 is the coefficient of the term. Take the example of a person who donates $100 to public radio and $100 on average to two other charities. For every $1 increase in average donation to the two other charities, the person will increase his donation to public radio by $0.185. We know that this term could either account for wealth or some measure of warm glow.

Thus, the next step is to determine the extent to which this term proxies for wealth. Indeed, it would be expected that individuals who contribute to more charities

will also tend to be wealthier, for two reasons. The first is the result of the progressive tax structure in which wealthier people pay higher taxes on their marginal income. In addition, we would expect that those who have more resources tend to donate more money, while individuals who can only afford basic necessities will be unable to donate towards public goods.

There were several possible approaches in order to control for wealth. The first occurred in the regression; demographic factors such as education are highly correlated with earnings. However, education was not a significant factor in the regression (p-value = 0.52). The second attempt was through the use of the person's ZIP code in order to determine the average income of the neighborhood--and by extension its individual residents--as provided by the US Census Bureau. However, this factor also proved insignificant when included in the regression. Below is a scatter plot of the transformed average 3 year contribution and the per capita income of the neighborhood by ZIP code. The best-fit line has a slope of 0.00000543 and the R squared is 0.000122, showing that the average wealth of the neighborhood has no bearing on donation size. In a last attempt to control for income, an average income was determined for each person based on their level education and gender from US Census Bureau data. As before, there was no significant relationship between wealth and contribution size (p-value = 0.67).

Log(Ave 3 Yr Contribution) Vs. Per Capita Income

Linear Fit

Log(Ave 3 Yr Contribution) = 4.4535062 + 5.43e-7 Per Capita
Income

Summary of Fit

Rsquare	0.000122
RSquare Adj	-0.00252
Root Mean Square Error	0.591212
Mean of Response	4.474259
Observations (or Sum Wgts)	380

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	4.4535062	0.101136	44.03	<.0001
Per Capita Income	5.43e-7	0.000003	0.22	0.8298

Hence, we can conclude that wealth does not play a role in determining donation sizes.   This seems plausible given that the relatively small contributions do not significantly change rich donors' tax bills. Additionally, one may safely infer that public radio's preponderantly college-educated donors are middle class Americans whose

income makes donations possible. Hence, it appears that this measures some propensity to donate or the warm glow of the individual.

At the same time, altruism fails as an explanation, for under that theory donation sizes are contingent on income. As income increases, the marginal benefit of money goes down, while the marginal benefit of donating money remains the same. Hence, we would expect income to be positively correlated with donation size-- which is not the case.

Caveats

One basic consideration when interpreting these results is the absence of information on non-donors. It is almost certain that some regressors emerged as insignificant in determining donation size only because of the lack of non-donor information. In Appendix III we can see the average score for each question as well as the standard deviation. The motivation "because I listen" received an average score of 4.80, meaning that virtually everybody listed this as a motivation. However, because there is very little variance in the data this factor did not come out to be significant. On the other hand, if information of non-donors had been included, there would be much more variance in the response to this question. Hence, we see that the lack of inclusion of non-donors made certain regressors unlikely to show up as significant. Other factors such as wealth and level of education may prove to be significant once non-donors are included.

Another set of data is not included in our information: the arguments made during the relevant pledge drive to appeal to donors' wallets. Common sense, combined with our own familiarity with pledge drives, suggests that every sort of pitch imaginable was made

at some point during the multi-day activity. Surely the need to fill a large number of hours of air-time with an essentially brief, unchanging message must create a *sui generis* set of exigencies and even a certain amount of creative desperation. Still, the many obstacles to collecting the data aside, it would have been interesting to correlate the relationship between the various arguments in the station's presentation, and the relative weight of each, to the donors' subsequent data. It is not inconceivable that difference in emphasis of on the various motivations could create at least somewhat different results.

Another factor to keep in mind, as stated earlier, is the distinction between a charity like public radio and those which do not offer a good or service for the donor's active "consumption." The motivations of donors for tsunami relief charities, for example, will always be somewhat different than that of public radio's contributors. In the former, the transactional aspect would be absent, for no gift or direct service is at issue; conversely, we would expect urges like altruism to be much stronger. The pictures of starving children, conceivably, would activate a person's altruism in a way that an appeal from public radio cannot achieve.

Further Research

The gift-transactional aspect of donations would be an interesting area to explore further. In this "transaction" an individual receives public radio and a free gift in exchange for a donation. As indicated earlier, it would be interesting to decompose the value of the donation into the amount donated because of receiving public radio and the free gift, so as to better understand the effectiveness of free gifts for fundraising.

Also useful—on both an academic and a practical level—would to develop a more complete model of how individuals change their donations when their expectations of others' donations change. While donors, as we have seen, tend to make donations in line with the gift-giving of others, in fact their perceptions about others' giving is substantially underestimated. The average and median donation sizes (actual donations, not self-reported) were $109 and $82. The average and median of the estimated donation of other contributors were $83 and $67. Hence, the result of that research could give guidance to public radio on increasing income by merely changing perceptions of the average donation. In addition, if public radio could somehow raise these perceptions, it would give researchers a natural occurring instance in which expectations are exogenously changing.

Conclusion

Much has been written about the puzzle of why individuals contribute to public goods, paying for something they can obtain for free. Various theories, which range from complementary to exclusionary in their inter-relationship, have been proposed. This paper explores donors' motivations by using data supplied by contributors themselves, via a public radio survey.

The answers reveal distinct patterns. Public radio's typical donor has a long-standing relationship with the station and is an "active consumer" of its "product." The notion of "exchange" is a big motivator in their gift-giving. Very strong support exists for "conditional cooperation"--individuals donate more willingly if they perceive others are doing so as well. The "warm-glow" factor had evident appeal as well. The data

reflected, at the same time, which motivators were less influential. The "social norm" factor, for example, does not seem to be nearly as strong as the ones cited earlier. This is not surprising, given that most listeners know few people who donate, making it difficult to establish social penalties for not donating. It is also consistent with a picture that emerges of donors giving because of their perceived personal relationship with the station, and not because of what others may think.

There is a limit to the information that can be gleaned from one study. At the same time, research has a way of identifying new questions even as it provides answers to old ones. There is more to be explored, and this paper has touched on some interesting possibilities. Still, we have gathered important insights into the character and motivations of public radio listeners, a fact which will be of tremendous importance both to the institution of public radio itself and to others with a comparable function. .

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Appendix I

In order to measure the effectiveness of this fund-raising effort, you are invited to join in a study conducted by Professor Rachel Croson from the University of Pennsylvania. If you could spend 5 minutes filling out this survey and send it back in the yellow self-addressed envelope by Oct. 15, 2003, this station will receive <u>an additional contribution of $5</u> from the survey group for each of the first 200 surveys returned. **Note that your membership renewal and this survey should be returned in two <u>separate</u> envelopes.** Thank you for your participation!

1 Why do you contribute to public radio? Please circle one of the five numbers for each reason to indicate <u>how well</u> they describe why you contribute. Number "1" represents " not at all" and number "5" represents "very well".

I contribute …

Not at all

Very well

Because I listen	1	2	3	4	5
Because it feels good to contribute	1	2	3	4	5
To make sure other listeners *will* get the same quality service	1	2	3	4	5
To make sure that I will get the same quality service	1	2	3	4	5
Because other people I know (e.g. friends, colleagues) contribute	1	2	3	4	5
So I do not feel guilty when I listen	1	2	3	4	5
To increase the quality of the service that other listeners get	1	2	3	4	5
Because I want to do my share	1	2	3	4	5
Because I like the thank you gifts provided	1	2	3	4	5
Because I want to set an example for other listeners	1	2	3	4	5
Because I want to set an example for my children	1	2	3	4	5
Because public radio is important in my life	1	2	3	4	5
Because I believe other funding sources are not sufficient	1	2	3	4	5
Because I want to help others	1	2	3	4	5
To prevent the station from going off the air	1	2	3	4	5
Because I believe that other listeners contribute	1	2	3	4	5
Because it is the right thing to do	1	2	3	4	5
Because I feel obliged to contribute	1	2	3	4	5
Because the staff works hard to provide the service	1	2	3	4	5
To increase the quality of the service I get	1	2	3	4	5
Because I like it when other people see my logo merchandise	1	2	3	4	5

2 In what year did you first start listening? _____

3 For how many hours (approximately) have you listened each day during the past year?

5 If you listen to stations other than this one, please list the top other three stations:
    (leave the lines blank, if you do not listen to other stations either on the radio or online)
        1. _____   2. _____   3. _____

6 What is your closest estimate of the <u>average</u> contribution of members?
        ☐ < $ 50   ☐ $ 60 - $74   ☐ $ 75 - $99   ☐ $100 -
$124
        ☐ $125 – $ 179   ☐ $ 180 - $239   ☐ $ 240 - $ 360   ☐ Other ____
        _____

7 How many people do you know who <u>listen to</u> this station?
        Family Members ☐ no one ☐ 1 person ☐ 2 people ☐ 3 people ☐
Other _
        Co-workers   ☐ no one ☐ 1 person ☐ 2 people ☐ 3 people ☐
Other _
        Friends   ☐ no one ☐ 1 person ☐ 2 people ☐ 3 people ☐
Other _

8 How many people do you know who <u>contribute to</u> this station?
        Family Members ☐ no one ☐ 1 person ☐ 2 people ☐ 3 people ☐
Other _
        Co-workers   ☐ no one ☐ 1 person ☐ 2 people ☐ 3 people ☐
Other _
        Friends   ☐ no one ☐ 1 person ☐ 2 people ☐ 3 people ☐
Other _

9 What is your sex?   ☐ Male   ☐ Female

10 What is your age?
        ☐ 18 – 24 years   ☐ 25 – 29 years   ☐ 30 – 34 years   ☐   35 – 44
years
        ☐ 45 – 54 years   ☐ 55 – 64 years   ☐ 65 – 74 years   ☐ 75 years or
over

11 What is the highest level of formal education you have completed?
        ☐ Grade 8 or less   ☐ Grade 9-11 years   ☐   Graduated high
        school
        ☐ 1-3 years of college   ☐ 4 year college degree   ☐ S ome graduate
        credits
        ☐ Advanced degree (MA, MD, PHD)

12 Please indicate the category which best describes yourself
        ☐ Hispanic/Latino   ☐ Black/African American ☐   A   sian/Pacific
        Islander
        ☐ White/Caucasian   ☐ Native American/Indian
        ☐ Mixed/Other (Please write in) _____

13 Please indicate your relationship status?
        ☐ Now married   ☐ Widowed   ☐ Divorced   ☐ Separated

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Appendix II

Proof that measurement error will results in over-rejection of the alternative hypothesis:

Suppose that

$Y_i = B_0 + B_1 * x_i + U_i$

is the true relationship that we are trying to estimate. Now suppose that instead of x_i, we only have

$x_i' = x_i + V_i$

which represents "noisy" data. Hence, with this noisy data we will tend to estimate

$Y_i = A_0 + A_1 * x_i' + U_i$

which using OLS implies that

$$\hat{A}_1 = \frac{\sum Y_i x_i - N * \text{Mean}(Y) * \text{Mean}(x_i')}{\sum x_i' - N * \text{Mean}(x_i')^{\wedge}2}$$

which converges in probability to

$$\frac{B_1 * \sigma_x{}^{\wedge}2}{\sigma_x{}^{\wedge}2 + \sigma_{x'}{}^{\wedge}2} < B_1$$

Hence, with noisy data, which is the case for surveys, we will tend to consider more regressors insignificant than we should.

Appendix III

Question	Average	St. Dev.
Because I want to help others	2.93	1.25
increase other's quality	2.69	1.22
Listeners Same Quality	2.82	1.28
Because I want to set an example to others	2.83	1.35
To make sure that I will get the same quality service	3.78	1.15
To prevent the station from going off the air	4.27	1.00
Because the staff works hard to provide the service	3.82	1.11
Because it is important in my life	4.19	0.91
Because I like the thank you gifts	2.65	1.20
Because my friends contribute	1.58	0.91
Because I believe that other listeners contribute	2.54	1.26
Because I like it when other people see my logo merchandise	1.75	1.08
Because I want to do my share	4.25	0.83
Because I feel obliged to contribute	2.98	1.26
Funding not sufficient	3.47	1.13
Because it is the right thing to do	3.98	1.04
So I do not feel guilty when I listen	2.55	1.28
To increase the quality of the service I get	3.03	1.26
Because I listen	4.80	0.55
Because it feels good to contribute	3.71	1.08

	Average	3.23	1.11

Question	Average	St. Dev.
Because I want to help others	-0.31	0.96
increase other's quality	-0.55	0.92
Listeners Same Quality	-0.42	0.99
Because I want to set an example to others	-0.39	1.07
To make sure that I will get the same quality service	0.54	0.92
To prevent the station from going off the air	1.01	0.92
Because the staff works hard to provide the service	0.58	0.86
Because it is important in my life	0.94	0.84
Because I like the thank you gifts	-0.59	1.08
Because my friends contribute	-1.64	0.84
Because I believe that other listeners contribute	-0.69	1.01
Because I like it when other people see my logo merchandise	-1.47	0.96
Because I want to do my share	1.01	0.76
Because I feel obliged to contribute	-0.24	1.14
Funding not sufficient	0.23	1.05
Because it is the right thing to do	0.73	0.90
So I do not feel guilty when I listen	-0.67	1.16
To increase the quality of the service I get	-0.19	1.03
Because I listen	1.53	0.74
Because it feels good to contribute	0.46	0.88

	Average	-0.01	0.95

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Appendix IV

	Question6: Est_Average	Log(Average other two)	Gender	Other_Stations	Thank you Gifts	Listeners Same Quality	I same Quality	Friends	Like LOGO	obliged
Question6: Est_Average	1.00									
Log(Average other two)	-0.12	1.00								
Gender	-0.09	-0.23	1.00							
Other_Stations	0.05	0.06	-0.19	1.00						
Thank you Gifts	0.08	-0.02	-0.01	-0.07	1.00					
Listeners Same Quality	0.04	-0.02	-0.06	-0.01	-0.08	1.00				
I same Quality	-0.06	0.01	-0.06	0.02	-0.12	0.15	1.00			
Friends	0.05	0.05	-0.17	-0.03	0.19	-0.06	-0.25	1.00		
Like LOGO	0.01	0.02	-0.06	0.03	0.23	-0.10	-0.17	0.22	1.00	
obliged	-0.01	0.09	-0.13	0.13	-0.13	-0.26	-0.21	-0.11	-0.05	1.00