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Testing motives for charitable giving: A revealed-preference methodology with experimental evidence[☆]

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ABSTRACT

A large economics literature seeks to understand the reasons why individuals make charitable contributions. Fundamental features of most models of charitable giving are the inclusion of externalities induced by other agents and the Lancasterian characteristics approach to specifying utility functions. This paper develops a general, revealed-preference methodology for testing a variety of preference structures that allow for both externalities and characteristics. The tests are simple linear programs that are transparent, computationally efficient, and straightforward to implement. We show how the technique applies to standard models of privately provided public goods and novel models that account for other-regarding preferences based on relative consumption and donations among individuals. We also conduct an original experiment that enables testing and comparing many models on a single data set. Our experiment design allows us to focus on intrinsic motivations which are often hard to disentangle from other extrinsic or image effects in field data. The results provide the first revealed-preference evidence on the importance of social comparisons when individuals make charitable contributions. Models that include preferences for either relative consumption or donations yield significantly greater explanatory power than the standard model of impure altruism.

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1. Introduction

Why do individuals make charitable contributions? Despite a large economics literature on the subject, important questions remain. Standard explanations of private donations to a public good assume that individuals benefit from the aggregate level of the public good (Bergstrom et al., 1986) and may obtain an additional private benefit – commonly modeled as a “warm glow” – from their own giving (Cornes and Sandler, 1984; Andreoni, 1989, 1990). A notable feature of these standard models is that the contributions of others affect one's own charitable giving in only one way: crowding out through the total amount of the public good provided.

More recently, researchers have recognized that individuals may respond to the donations of others because of extrinsic, social concerns. For example, some studies seek to explain patterns of charitable giving based on reputation, signaling about income, and avoiding social

pressure.¹ There is, however, a much smaller body of work on how the actions of others may affect *intrinsic* motives for charitable giving, and this is surprising given evidence on the importance of “other-regarding” preferences in dictator and bargaining games.² It is easy to imagine, for example, that an individual's warm glow depends on how her donation compares to the donations of others, while other individuals may be reluctant to contribute if their wealthier peers appear relatively uncharitable. Alternatively, an individual may feel guilty if she donates less than a social norm while simultaneously having no desire to be overly charitable.

In this paper, we develop a theoretical and experimental framework to test whether intrinsic motivations play an important role in charitable giving. In doing so, our aim is not only to show the existence of

¹ See for example Hollander (1990), Glazer and Konrad (1986), Harbaugh (1998), Benabou and Tirole (2006), Ariely et al. (2009), and DellaVigna et al. (2012).

² Notable exceptions are Shang and Croson (2006, 2009) and Charness and Cheung (2013) that report the results of field experiments to study social comparisons. The former find that donors to a public radio station tend to adjust their contribution levels toward that of the social comparison. The latter show that varying the suggested contribution amount on a donation jar nonmonotonically affects contributions. Our analysis in the present paper, as we will show, is complementary in that we provide a close link to theory and show how tests for the importance of social comparisons (based on donations, private consumption, or both) can exploit multiple choices of the same individual rather than a cross section among individuals.

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such motives, but, additionally, to consider whether they are compatible with well-behaved preferences. We thus develop a revealed-preference methodology for testing different models of charitable giving. On one level, our theoretical framework nests the standard models of pure altruism, warm glow, and impure altruism (Bergstrom et al., 1986; Andreoni, 1989, 1990). More importantly, however, the framework readily accounts for models with other-regarding preferences based on concerns about relative donations, relative consumption, or both. Specifically, our specification of models, as we will show, allows for social comparisons in the well-established equity framework of Bolton and Ockenfels (2000) and the inequality framework of Fehr and Schmidt (1999).

We also provide evidence from a laboratory experiment showing that models incorporating other-regarding preferences are significantly better at explaining observed donations than the standard models. Our experimental approach exploits variation in a series of choices by each individual about charitable giving over different budget sets, relative prices, and information about the choices of others. With these data, we evaluate models based on whether there exists a concave and increasing utility function for each individual such that all of the observed choices are consistent with utility maximization. Hence, the revealed-preference tests on our experimental data provide “pure” tests of the various models, as the methodology is nonparametric, allows for complete heterogeneity across individuals, and is free of measurement error. While this procedure enables testing each model of charitable giving individually, we also show how specification tests are possible among models. Our statistical tests among competing models, as we will explain, account for differences in the power of revealed-preference tests according to adjustments proposed by Selten (1991) and Beatty and Crawford (2011).

Andreoni and Miller (2002) were the first to use revealed preferences to test for a particular form of altruism as an intrinsic motivation. They consider individual preferences of the form $U_i(x_i, y_i)$, where x_i and y_i are payoffs in a dictator game for oneself and another anonymous subject, respectively. They find that the specified utility function, which is considered altruistic because it accounts for another's payoff, rationalizes the vast majority of subject behavior.

Notwithstanding these results, the use of revealed preferences to test a broad set of motives for charitable giving poses new challenges. These arise because classical revealed-preference techniques do not readily accommodate two features that are central not only to models of charitable giving, but also to models of other-regarding preferences. One is externalities among agents, and the other is the Lancasterian characteristics within utility functions (Lancaster, 1971). Consider a simple demonstrative model involving two individuals with preferences $U_i(x_i, y_i - y_j, y_i + y_j)$ where x_i is private consumption, and y_i and y_j are the respective individual's contributions to a public good. This is essentially a characteristics model because one's own contribution enters the utility function in two places: the third argument as a standard contribution to the public good, and the second argument as a component of concern about relative donations. Negative and positive externalities are also present in the second and third arguments, respectively. As we will show, the two features of characteristics and externalities are fundamental to both standard models of public good provision and alternative models that incorporate social comparisons based on relative donations, consumption, or both.

A significant contribution of this paper is that we address new methodological challenges with the development of a revealed-preference approach for testing a range of models on charitable giving that include externalities and Lancasterian characteristics. The approach builds on recent innovations in revealed-preference theory that allow for both externalities (Carvajal, 2010; Deb, 2009) and characteristics (Blow et al., 2008) into a standard model of consumption. Empirically, the tests are simple linear programs that are transparent, computationally efficient, and straightforward to implement.

Our experimental results demonstrate the applicability of our revealed-preference framework and highlight the importance of other-regarding preferences as intrinsic motivation for charitable contributions. A distinct feature of our experiment design is that several models are testable on a single data set. Subjects in a laboratory setting face allocation choices based on the division of tokens between themselves and a local, charitable organization. Through a series of choices for each subject, we vary the endowment of tokens and the value per token for private consumption and charitable giving. Fundamental to our experiment design is that the subjects of primary interest are informed of the choices made by others in an earlier round when faced with the same token endowment and relative prices. This simple design allows both crowding out and social comparisons to affect subject choices, thereby enabling revealed-preference tests of different choice models. Additionally, the laboratory setting allows us to focus on intrinsic motivations that are often difficult to disentangle from extrinsic effects in the field.³ This is because our analysis is conducted separately on the choices made by each subject on multiple decision problems, which ensures that all other extrinsic factors such as beliefs about the quality of the charity, total donations by other subjects and donors are held constant across the choice scenarios.

We find new evidence on the importance of social comparisons as an intrinsic motivator for voluntary donations. Regarding the standard models, and after making power adjustments for revealed-preference tests, we find that impure altruism performs significantly better than the special cases of warm-glow giving and altruism consistent with provision of a pure public good. Importantly, however, impure altruism performs less well than alternative models based on intrinsic concerns about relative donations or relative private consumption. These results, along with robustness checks that we discuss, provide the first revealed-preference evidence on the importance of social comparisons to the understanding of charitable giving. While we consider a range of models in support of this conclusion, a strength of our methodology is its usefulness for revealed-preference analysis beyond the particular cases considered here. Indeed, we hope that our novel approach combined with the evidence herein will further research on the underlying motives for charitable contributions.

2. Theoretical framework

In this section, we develop our theoretical framework. While our experiment focuses on testing whether a single agent is best responding, we present the model in its full generality by allowing for multiple agents. We begin with the specification of a general utility function that nests different models for private provision of a public good, including the standard models and novel ones that account for other-regarding preferences. We then illustrate how Lancasterian characteristics and externalities, both of which are fundamental to the models we consider, complicate revealed-preference analysis. Finally, we establish a theorem that enables revealed-preference tests of any model based on preferences that satisfy properties of the general utility function.

2.1. The utility function

There are $i = 1, \dots, N$ agents in the economy. Each agent is endowed with wealth w_i that can be divided between consumption of a private good x_i and donations to a public good y_i .⁴ Prices are denoted p_x and

³ With respect to public goods, Vesterlund (2006) describes how the control that experimental methods afford the researcher has broadened the scope of empirical analysis beyond studies of crowding out to consider social norms, rules, and different ways of accounting for others' behavior. Also consistent with our revealed-preference approach, Vesterlund (2012) argues that “the objective is no longer to determine whether individuals are selfish or cooperative, but instead whether giving can be viewed as rational, and if so what set of preferences are consistent with the observed pattern of giving” (p. 2).

⁴ The model can be generalized to allow for multiple private and public goods for each agent i .

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