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Several Ways: Theory and
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Serving the Public Interest in Several Ways: Theory and Empirics

Abstract

We develop a model where people differ in their altruistic preferences and can serve the public interest in two ways: by making donations to charity and by taking a public service job and exerting effort on the job. Our theory predicts that people who are more altruistic are more likely to take a public service job and, for a given job, make higher donations to charity. Comparing equally altruistic workers, those with a regular job make higher donations to charity than those with a public service job by a simple substitution argument. We subsequently test these predictions using the German Socio-Economic Panel Study, which contains data on self-reported altruism, sector of employment, and donations to charity for more than 7,500 workers. We find support for most of our predictions.

JEL-Codes: D640, H110, J450, M500.

Keywords: altruism, charitable donations, public service motivation, public sector employment, self-selection.

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1 Introduction

Many people feel a need to serve the public interest or to increase the well-being of others, even of complete strangers. Andreoni and Miller (2002) study such altruistic preferences in the lab and find that a majority of people are willing to spend some money (anonymously) in order to increase the well-being of unknown others.¹ In practice, two common ways of serving the public interest are making a donation to charity and taking a job that involves helping others. Both these altruistic behaviors are prevalent in modern societies. List and Price (2012) report data showing that in rich countries typically more than half of the population make donations to charity. Data from the International Social Survey 2015 suggest that many people aspire and many have a job in which they can increase the well-being of others, see the first column of Table 1.

In this paper we develop a coherent framework to study the role of altruistic preferences in job choice, on-the-job effort provision, and charitable donations. We set up a simple theoretical model, and subsequently test the model's predictions using rich survey data. In our model, people differ in their altruism and can serve the public interest in two ways: by making a charitable donation and by taking a public service job and exerting effort on the job. People make three decisions: whether to take a public service job or a regular job, how much effort to exert at work, and how much of their income to donate to charity.

Our theoretical analysis yields the following predictions. First, as in related models that we discuss below, the likelihood of having a public service job (weakly) increases in a worker's altruism. The reason is that holding a public service job gives opportunities to contribute to the well-being of others at relatively low cost, which is appreciated by – and hence attracts – altruistic workers. Second, and quite naturally, for a given job type, charitable donations (weakly) increase in workers' altruism. Third, and perhaps more surprising, for a given altruism and income, workers holding a regular job donate more to charity than workers holding a public service job. The intuition behind this result is that public service workers already contribute to the well-being of others by exerting effort on the job and, hence, by a substitution argument, they donate less.

Our study is related to a rapidly expanding theoretical literature in eco-

¹See also Beckman et al. (2002) and Falk et al. (2005), among others.

nomics studying self-selection and workplace behavior of intrinsically motivated workers, see for example Francois (2000, 2007), Besley and Ghatak (2005), Prendergast (2007), Delfgaauw and Dur (2007, 2008), Brekke and Nyborg (2008), Dal Bó et al. (2013), Dur and Zoutenbier (2015), Manna (2015), Cassar (2016a), and Barigozzi and Burani (2016). In many of these studies, intrinsic motivation takes the form of altruism. We enrich this literature by allowing workers to serve the public interest in several ways – not only by exerting effort on certain types of jobs, but also by making charitable donations.

Our theoretical predictions point to a possible flaw in the empirical literature. Numerous public administration scholars and several economists have examined whether workers in some sectors or job types are more altruistic than in others (see Perry et al. 2010 and Perry and Vandenabeele 2015 for overviews). Many of these studies measure a worker’s altruistic preferences using data on the worker’s behavior outside the workplace, among others on the worker’s donations to charity (e.g. Brewer 2003, Houston 2006, Rotolo and Wilson 2006, Lee 2012, and Piatak 2015). Our theory suggests that this measure is flawed and leads to an underestimation of altruism of workers in public service jobs. Indeed, our theory does not rule out that workers in public service jobs on average donate less to charity than workers in regular jobs do, and yet are more altruistic. This is particularly likely when public service jobs offer ample opportunities to serve the public interest, such that workers in those jobs feel less of a need to make further contributions outside the workplace.²

We empirically examine our predictions using data from the German Socio-Economic Panel Study (SOEP). The SOEP is a representative longitudinal study covering 30,000 persons in 11,000 households. It contains questions about individual’s education, earnings, employment, personality characteristics, and behavior. The key variables that we use for our analysis are self-reported altruism, money donations to charity, and job type or sector of employment. Following Becker et al. (2012) and Dur and Zoutenbier

²See Buurman et al. (2012) and Tonin and Vlassopoulos (2015) for related, though less precise, arguments. Another related paper is the recent study by Aldashev et al. (2016) that examines rent extraction, charitable donations, and self-selection of altruistic and selfish managers into for-profit and not-for-profit organizations, and finds that multiple equilibria may arise. Our theory also relates to the literature on moral licensing in social psychology, which posits that people tend to take immoral decisions following past good deeds (see Merritt et al. (2010) for a recent review).

(2015), we measure a worker’s altruism by his response to the question: “How important do you find it to be there for others currently?” Donations to charity are measured by the response to the question: “Did you donate money last year (not counting membership fees)?” If the answer to this question is yes, the respondent is asked to report the total amount donated. Lastly, in line with the literature, we use several definitions of what a public service job exactly is.³

Consistent with our theory, we find that workers who are more altruistic are more likely to take a public service job and, for a given job type, donate a higher amount to charity. Furthermore, we find that workers in a regular job make significantly higher donations to charity than equally altruistic workers in a public service job. However, this difference moves close to zero and becomes statistically insignificant when we control for income. Moreover, the result turns out to be sensitive to the estimation method. For the subsample of highly educated workers and for male workers we find results that are more supportive for our predictions, and we discuss reasons for why this may be the case.

Studying workers’ charitable behavior and self-selection into jobs is interesting in itself as well as relevant from a policy perspective. Studies like ours contribute to the body of knowledge about the prevalence of work motivations in different job types and sectors, which can be used when designing HR-policies. Moreover, as our study provides insights into the drivers of charitable donations, our results may be useful for charitable organizations in designing and targeting their promotion activities.

An essential assumption underlying our theory is that jobs differ in the opportunities they give workers to serve the public interest. Table 1 shows some recent data supporting this assumption. The International Social Survey 2015 asked workers whether they can help other people in their job and

³In the literature there is no agreement on what a public service job exactly is. Following Perry and Wise (1990)’s concept of public service motivation, many papers compare workers employed in the public sector with those employed in the private sector, for example Vandenabeele (2008), Steijn (2008), and Christensen and Wright (2011). Other papers also compare workers employed in different industries or job types, see for example Gregg et al. (2011), Houston (2011), Christensen and Wright (2011), and Kjeldsen and Jacobsen (2013). In our empirical work we use two definitions. First, we define public service jobs as jobs in the public sector and regular jobs as jobs in the private sector. Later, we define public service jobs as jobs in certain industries (health, sport and education, and public administration) and regular jobs as jobs in the remaining industries. The results we obtain are roughly the same.

whether their job is useful to society. Workers holding a public sector job report significantly higher scores on both dimensions as compared to workers holding a private sector job. Lockwood et al. (2016) review estimates of the economy-wide externalities generated in a number of professions, showing positive and substantial externalities for teaching and research and negative externalities for finance and law. The number of professions for which an estimate is available is, however, very limited.

The remainder of this paper is organized as follows. In the next section we develop and analyze our theoretical model and derive predictions. In Section 3 we describe the data and the empirical strategy. Section 4 presents our empirical results. Section 5 concludes.

2 Theory

2.1 Model

We develop a model where workers take three decisions: they choose between a regular job ($s = 0$) and a public service job ($s = 1$), how much effort to exert on the job ($e_{s,i} \geq 0$), and how much of their income to donate to charity ($d_{s,i} \geq 0$). Workers are heterogeneous in two ways. First, they differ in their altruism denoted by γ_i . We assume altruism is impure, as in Andreoni (1990). That is, a worker receives a ‘warm-glow’ utility from making a contribution to the well-being of others, but he does not directly care about other’s utility. This approach is in line with earlier related models such as Besley and Ghatak (2005), Delfgaauw and Dur (2008), Dur and Zoutenbier (2015), and Aldashev et al. (2016).⁴ Tonin and Vlassopoulos (2010) provide field-experimental evidence supporting this assumption. The altruism parameter γ_i follows a continuous distribution with boundaries $[0, \bar{\gamma}]$ with $\bar{\gamma} > 0$. Second, workers differ in a fixed benefit (or cost) from choosing a public service job, denoted by ε_i . This variable is meant to represent worker i ’s preference for job aspects other than those stressed by our theory, such as commuting time, pension plans, and other job (dis)amenities. ε_i is drawn from a continuous distribution with boundaries $[\underline{\varepsilon}, \bar{\varepsilon}]$ where $\underline{\varepsilon} < 0 < \bar{\varepsilon}$. We shall assume a sufficiently rich type space (sufficiently low $\underline{\varepsilon}$ and sufficiently high $\bar{\varepsilon}$), so that in equilibrium any possible altruism type γ_i is present in

⁴For an overview of theoretical papers applying different types of altruism, see Francois and Vlassopoulos (2008).

both types of jobs.

A worker's utility depends on his private consumption, on his cost of effort, the fixed benefit or cost ε_i when working in a public service job ($s = 1$), and – if the worker is altruistic ($\gamma_i > 0$) – on his contribution to the well-being of others. More specifically, we assume that worker i 's utility increases linearly in his private consumption, that his effort costs are quadratic, and that his 'altruistic utility' is log-linear in his contributions to the well-being of others:⁵

$$U_i(d_{s,i}, e_{s,i}) = w_{s,i} - d_{s,i} - \frac{1}{2}\theta e_{s,i}^2 + \gamma_i \ln(d_{s,i} + \beta_s e_{s,i}) + s\varepsilon_i,$$

where $w_{s,i}$ denotes worker i 's wage when working in sector s , private consumption is the difference between the worker's wage ($w_{s,i}$) and his donation to charity ($d_{s,i} \geq 0$), the parameter θ is a measure for the cost of effort, and β_s is the effect of a unit of effort in job type s on the well-being of others. For simplicity, we assume $\beta_0 = 0$ and $\beta_1 > 0$. That is, only effort in a public service job increases the well-being of others, while effort in a regular job does not. However, our key predictions are similar if on-the-job effort would increase the well-being of others in all jobs but more so in public service jobs, which is in line with the available empirical evidence discussed in the Introduction. Besides exerting effort in a public service job, workers can serve the public interest by donating money to charity, and we assume that these two instruments are substitutes. For convenience, we assume that they are perfect substitutes.⁶ Furthermore, we assume that workers are paid for performance in regular jobs, while workers receive a flat wage in a public service job. More precisely, wages in regular and public service jobs equal $w_0 = a + xe_0$ and $w_1 = z$, respectively, where x equals the marginal product of effort of workers in a regular job (assuming perfect competition in the labor market) and z is such that the demand for public services equals the supply of those services provided by workers in public service jobs in equilibrium.

⁵The linearity of utility in private consumption implies that we abstract from income effects. This greatly simplifies the analysis. In the empirics, we run analyses with and without controlling for income.

⁶Volunteering is another important way to serve the public interest. We abstract from volunteering in our analysis, because volunteering can have meaningful private returns in the labor market as well, see e.g. the field-experimental evidence in Baert and Vujić (2016) and the references therein. Yeomans and Al-Ubaydli (2016) study the relation between volunteering for and making charitable donations to the same non-profit firm and find some evidence for substitutability.

The assumption of flat wages in public service jobs is in line with the stylized fact that pay is typically less dependent on performance in those jobs.⁷ Our key predictions need not change if we allow for performance pay in all jobs.

The timing of the events is as follows. First, nature draws each worker's γ_i and ε_i . Second, workers choose either a regular or a public service job. Finally, workers choose their effort and donations.

2.2 Analysis

We solve the model by backward induction and first derive the on-the-job effort and charitable donations a worker chooses for a given job type. Next, we will analyze which worker types, in terms of γ_i and ε_i , sort into which job type. Along the way, we will formulate predictions that will be empirically examined in Section 4.

If worker i has a regular job ($s = 0$), his optimization problem reads

$$\max_{e_{0,i}, d_{0,i}} a + xe_{0,i} - d_{0,i} - \frac{1}{2}\theta e_{0,i}^2 + \gamma_i \ln(d_{0,i}).$$

Optimal effort $e_{0,i}^* \geq 0$ and optimal donations $d_{0,i}^* \geq 0$, are found by simultaneously solving the following first-order conditions:

$$\frac{\partial U(\cdot)}{\partial e_{0,i}} = x - \theta e_{0,i}^* = 0,$$

$$\frac{\partial U(\cdot)}{\partial d_{0,i}} = -1 + \frac{\gamma_i}{d_{0,i}^*} = 0,$$

which results in:

$$e_{0,i}^* = \frac{x}{\theta}, \tag{1}$$

$$d_{0,i}^* = \gamma_i. \tag{2}$$

Hence, workers with a regular job all exert the same level of effort, independent of their altruistic preferences.⁸ Altruistic workers with a regular job donate a part of their income to charity, and the more so the stronger

⁷For example, Burgess and Metcalfe (1999) report that incentive pay is more prevalent in private sector jobs than in public sector jobs. Likewise, in the education industry, pay is generally based on experience and academic degrees and not on effort or performance, see e.g. Podgursky (2007).

⁸This stems from the assumption that utility increases linearly in private consumption.

their altruistic preferences. Selfish workers (those with $\gamma_i = 0$) would like to extract money from charities ($d_{0,i}^* < 0$), but the non-negativity constraint naturally prevents this, and so their donations equal zero.

If worker i has a public service job, his optimization problem reads

$$\max_{e_{1,i}, d_{1,i}} z - d_{1,i} - \frac{1}{2}\theta e_{1,i}^2 + \gamma_i \ln(d_{1,i} + \beta_1 e_{1,i}) + \varepsilon_i.$$

Optimal effort $e_{1,i}^* \geq 0$ and optimal charitable donations $d_{1,i}^* \geq 0$ are found by simultaneously solving the first-order conditions:

$$\frac{\partial U(\cdot)}{\partial e_{1,i}} = -\theta e_{1,i}^* + \frac{\gamma_i \beta_1}{d_{1,i}^* + \beta_1 e_{1,i}^*} = 0,$$

$$\frac{\partial U(\cdot)}{\partial d_{1,i}} = -1 + \frac{\gamma_i}{d_{1,i}^* + \beta_1 e_{1,i}^*} = 0,$$

which gives after solving:

$$\text{if } \gamma_i \leq \frac{\beta_1^2}{\theta} \Rightarrow e_{1,i}^* = \sqrt{\frac{\gamma_i}{\theta}} \text{ and } d_{1,i}^* = 0; \quad (3)$$

$$\text{if } \gamma_i > \frac{\beta_1^2}{\theta} \Rightarrow e_{1,i}^* = \frac{\beta_1}{\theta} \text{ and } d_{1,i}^* = \gamma_i - \frac{\beta_1^2}{\theta}. \quad (4)$$

Clearly, not all of the altruistic workers in a public service job make donations to charity. Those with altruism lower than or equal to β_1^2/θ only exert effort and do not supplement it by making charitable donations. The reason for this is that, up to some point, exerting effort on the job is a less costly way to serve the public interest than making charitable donations. Consequently, workers with relatively low levels of altruism will only make use of this less costly instrument, and the more so, the more altruistic the worker is. When work effort reaches a critical level, making charitable donations becomes the less costly option at the margin. As a result, workers whose altruism is higher than β_1^2/θ use both effort and donations to serve the public interest. Note that starting at the threshold level of altruism of β_1^2/θ , higher altruism results in an increase in donations, while effort remains the same. Thus, as compared to models where people can only serve the public interest through on-the-job effort, we find that adding the option to make charitable donations truncates effort for public service jobs. Note that the level at which effort is truncated critically depends on the effectiveness of effort as compared to that

of charitable donations, as measured by β_1 . Clearly, when on-the-job effort is more effective in raising the well-being of others, effort plays a bigger role at the expense of charitable donations. Lastly, note that (2), (3), and (4) imply that, for a given altruism, a worker's charitable donations are always higher when holding a regular job as compared to holding a public service job. The reverse holds, however, for total contributions to the public interest ($d + \beta e$) for workers with altruism smaller than β_1^2/θ . The intuition is that workers with a public service job can contribute to the public interest at a lower cost, and hence contribute more. For workers with altruism equal to or higher than β_1^2/θ , total contributions are the same across job types for a given level of altruism. The reason is that, for those workers, the marginal costs of charitable donations drives their total contribution, which is independent of job type.

The choices that workers make are depicted in Figure 1.

[Figure 1]

In Section 4, we will empirically examine the following predictions regarding worker's charitable donations:

Prediction 1: For a given job, charitable donations (weakly) increase in a worker's altruism.

Prediction 2: For a given worker's altruism, charitable donations are higher when holding a regular job as compared to when holding a public service job.

We shall examine whether these predictions find support in the data, with and without controlling for worker's income in the regressions.

Now that we have analyzed the behavior of workers in a given job type, we examine which worker types sort into which job type. Substituting (1) and (2) into the utility function gives, after some rewriting, the utility derived from taking a regular job:

$$U_i(d_{0,i}, e_{0,i}) = a + \frac{x^2}{2\theta} - \gamma_i + \gamma_i \ln(\gamma_i).$$

Workers taking a public service job attain utility:

$$\begin{aligned}
 U_i(d_{1,i}, e_{1,i}) &= z - \frac{\gamma_i}{2} + \gamma_i \ln(\beta_1 \sqrt{\frac{\gamma_i}{\theta}}) + \varepsilon_i \text{ when } \gamma_i \leq \frac{\beta_1^2}{\theta}; \\
 U_i(d_{1,i}, e_{1,i}) &= z + \frac{\beta_1^2}{2\theta} - \gamma_i + \gamma_i \ln(\gamma_i) + \varepsilon_i \text{ when } \gamma_i > \frac{\beta_1^2}{\theta},
 \end{aligned}$$

which follows from substituting (3) and (4) into the utility function. Comparing the utilities attained in a regular and public service job, it follows that workers with $\gamma_i \leq \beta_1^2/\theta$ choose a public service job if:

$$z - a - \frac{1}{2} \frac{x^2}{\theta} + \frac{1}{2} \gamma_i + \gamma_i \ln\left(\beta_1 \sqrt{\frac{\gamma_i}{\theta}}\right) - \gamma_i \ln(\gamma_i) + \varepsilon_i \geq 0. \quad (5)$$

There is an interior solution for any possible γ -type if $\bar{\varepsilon}$ is sufficiently large and $\underline{\varepsilon}$ is sufficiently low. It is also straightforward to derive that the left-hand side of the inequality increases with γ_i . Hence, for workers whose altruism is smaller than or equal to β_1^2/θ , it holds that those with stronger altruistic preferences are more likely to choose a public service job. The intuition is that a public service job offers an opportunity to serve the public interest at a relatively low cost, which is more attractive for workers with stronger altruistic preferences as they make more use of it. For workers with $\gamma_i > \beta_1^2/\theta$, we find that they prefer a public service job if:

$$z - a + \frac{\beta_1^2}{2\theta} - \frac{x^2}{2\theta} + \varepsilon_i \geq 0. \quad (6)$$

Hence, for these highly altruistic workers, the attractiveness of a public service job does not increase with the worker's altruism. The reason is that all workers within this group use the opportunity to serve the public interest on the job to the same extent, see equation (4) above. Hence, the probability of choosing a public service job does not further increase with altruism starting at $\gamma_i = \beta_1^2/\theta$.

The preferences for job type are depicted in Figure 2.

[Figure 2]

In equilibrium, the wage for public service jobs z will be such that supply of and demand for services are equal:

$$\int_0^{\gamma^*} \int_{\varepsilon(\gamma)}^{\bar{\varepsilon}} \sqrt{\frac{\gamma_i}{\theta}} f(\varepsilon, \gamma) d\varepsilon d\gamma + \int_{\gamma^*}^{\bar{\gamma}} \int_{\varepsilon(\gamma^*)}^{\bar{\varepsilon}} \frac{\beta_1}{\theta} f(\varepsilon, \gamma) d\varepsilon d\gamma = D \quad (7)$$

where $\gamma^* = \beta_1^2/\theta$, $\varepsilon(\gamma)$ is the relation resulting from condition (5) holding with equality, $f(\varepsilon, \gamma)$ is the probability density function, and D represents the demand for public services measured in units of effort (which may well depend on the cost per unit, but is assumed to be constant here for convenience). Without loss of generality, we assume a mass of workers equal to unity. Note that when z goes up, $\varepsilon(\gamma)$ goes down, implying an increase in supply. Note also that whether in equilibrium a negative or positive wage differential arises for public service jobs depends crucially on the distribution of the fixed job benefit ε , the supply of altruistic workers as captured by the distribution of γ , as well as on the size of the demand for public services D .

The prediction that will be studied in Section 4 resulting from the analysis of job choice is:

Prediction 3: Workers who are more altruistic are (weakly) more likely to choose a public service job.

3 Data and Empirical Strategy

We use data from the German Socio-Economic Panel Study (SOEP).⁹ The SOEP is an unbalanced panel which contains survey questions about employment, earnings, preferences, and personality measures among others (see Wagner et al. 2007). Our key variables of interest are self-reported monetary donations to charity, altruistic preferences, and job type or sector of employment. We measure charitable donations by the response to the question: "Did you donate money last year (not counting membership fees)?"¹⁰ The respondents who answered this question with "yes" were subsequently

⁹Detailed information about the SOEP can be found at <http://www.diw.de/en/soep>.

¹⁰In the questionnaire, it is further stated that "We understand donations here as giving money for social, church, cultural, community, and charitable aims, without receiving any direct compensation in return. These donations can be large sums of money but also smaller sums, for example, the change one puts into a collection box. We also count church offerings."

asked how much money they donated in total. Following Becker et al. (2012) and Dur and Zoutenbier (2015), we measure altruistic preferences by the respondent's answer to the question: "How important are the following things [being there for others] currently for you?" Answers are given on a four point scale, ranging from "not at all important" to "very important". Finally, we allow for two distinct definitions of what regular and public service jobs are. We start with defining public service jobs as jobs in the public sector and regular jobs as jobs in the private sector.¹¹ Next, we define public service jobs as jobs in certain industries (health, sport and education, and public administration) and regular jobs as jobs in the remaining industries. We exclude all people without a job from our sample.

One may be sceptical about the reliability of the questionnaire data we use, particularly about the self-reported altruistic preferences and donations. For instance, it might well be that people paint a too rosy picture of their altruistic preferences and their generosity. Even worse, such misrepresentation may correlate with job type. Recent findings from an incentivized experiment by Abeler et al. (2014), however, suggest that we should not be too sceptical about self-reported data. They find among a representative sample of the German population that participants forego considerable amounts of money to avoid lying.¹² Moreover, lying appears to be uncorrelated with sector of employment (personal communication with Johannes Abeler). Relatedly, Falk et al. (2016) examine the predictive power of survey questions for incentivized choices and find a sizeable correlation of 0.4 between stated and revealed willingness to donate part of a windfall gain to a charity.

We restrict our analysis to the year 2010, because this is the only year in which the question about charitable donations is included in the survey. The question that measures a respondent's altruism is taken from the 2008 wave, which is the most recent wave that includes this question. We have a sample of 7,527 respondents of which 26.2% is employed in the public sector and the remaining 73.8% is employed in the private sector (the corresponding figures for the alternative definition of a public service job are 33.0% and 67.0%).

To examine whether there is support for our predictions, we run an ordinary least squares (OLS) regression with money donations to charity as the

¹¹Unfortunately, it is not possible to distinguish between for-profit and not-for-profit employers in the private sector. This likely results in a downward bias in our estimates.

¹²See also Abeler et al. (2016) who use data from 72 experimental studies and find that people lie surprisingly little.

dependent variable.¹³ Our main specification is:

$$C = \alpha + \beta \cdot A + \psi \cdot S + \kappa \cdot I + \phi \cdot X + \eta,$$

where C is the amount of charitable donations, A is a worker's self-reported altruism, S is a dummy variable that equals one if a worker has a public service job, I is worker's income, X is a vector of other control variables, and η is the residual. In line with theoretical predictions 1 and 2, we expect that an increase in altruism leads to an increase in donations ($\beta > 0$) and that, for a given altruism, having a public service job instead of a regular job decreases donations ($\psi < 0$). While our theoretical model abstracts from income effects, we allow for those in the empirical analysis by including the worker's income. To examine theoretical prediction 3 regarding the altruism of workers with a public service job, we estimate the following regression equation:

$$S = \delta + \mu \cdot A + \lambda \cdot Z + \omega,$$

where S is a dummy variable equal to one if the worker has a public service job, A is the worker's altruism, Z is a vector of other control variables, and ω is the residual. In line with theoretical prediction 3 we expect that workers' probability to sort into a public service job increases in altruism ($\mu > 0$). The specification we estimate is identical to Dur and Zoutenbier (2015) who study the same issue using an earlier wave of the German Socio-Economic Panel. Following the terminology in Clemens (2017), this part of our analysis can be described as a form of replication called reproduction test.

In Table 2 we display the descriptive statistics of our sample. Since in most of our empirical analysis we compare public sector workers with private sector workers, we distinguish between these two in the descriptive statistics as well. There are several striking differences between public and private sector workers. For instance, the average donation made by public sector workers is 121.95 euros, while private sector workers on average donate 107.37 euros. There is quite a bit of variation in donations in both sectors. Public sector workers report to be more altruistic than private sector workers, though the difference in the average is small. Furthermore, public sector workers are on average older, are more often female, and are much higher educated than private sector workers. Also, public sector workers earn on

¹³As a robustness check, we also estimated a tobit model and a negative binomial regression model, and found very imprecise estimates with those models.

average a higher yearly income, while the standard deviation of their income is much lower than the standard deviation of incomes in the private sector.

Table 3 shows the correlations between our variables of interest. Charitable donations and altruism are positively correlated and the same is true for charitable donations and public sector employment and for altruism and public sector employment. Figure 3 plots the average charitable donations by sector of employment and altruism. Charitable donations tend to increase with a worker's altruism.¹⁴ Moreover, it turns out that, for a given altruism, public sector workers on average donate more than private sector workers. While this runs counter to our theoretical predictions, we should keep in mind that these are raw correlations, which do not control for important heterogeneity between public and private sector employees, among others in education, gender, and income. To control for these, we now turn to regression analysis.

[Figure 3]

4 Results

Table 4 reports the results of regressing charitable donations (measured in euros) on a worker's altruism, sector of employment, and a rich set of demographics. We include altruism in the most flexible manner, i.e. we take up three dummies for altruism categories 1, 2, and 4, while category 3 – workers who answered they find it "important" to be there for others – forms the baseline category. We find evidence in line with predictions 1 and 2. That is, charitable donations increase with self-reported altruism and, for a given level of altruism, public sector workers donate significantly less than private sector workers. The difference is 32.51 euro, which is close to 30% of mean donations. The second column of Table 4 adds the worker's income as a control in a very flexible manner by taking up 10 dummies for income categories. The estimates show a positive convex relation between donations and income. More importantly, controlling for income moves the coefficient for public sector employment close to zero. Clearly, without controlling for income, the public sector dummy picked up that workers in the public sector

¹⁴Note that none of the respondents in the lowest altruism category (those who state that they find it not important at all to be there for others) donate any money to charity. Hence the lack of bars for this category in Figure 3.

make smaller donations because they earn less than comparable others in the private sector. Many of the other control variables have the same sign and are of similar size as compared to earlier studies. For example, highly educated workers donate more than lower educated workers (cf. Bekker and Wiepking 2011), though the difference decreases with almost 40 percent when controlling for income. Contrary to earlier studies, we don't find that females donate more than males (cf. Mesch et al. 2006). However, we should keep in mind that, in contrast to earlier studies, our regressions control for self-reported altruism, which is strongly positively correlated with gender (see Table 3).

Table 5 shows the same regressions using a different definition of a public service job, namely jobs in the health industry, sport and education industry, and public administration.¹⁵ The results are qualitatively the same, even though the coefficient for public service job is smaller and far from significant even when we do not control for income.

All our results so far are based on the full sample of workers. Motivated by Lewis and Frank (2002), Buurman et al. (2012), and Dur and Zoutenbier (2015) we replicated our results using a subsample of highly educated workers (i.e. more than high school). The main reason for this is that it might be that highly educated workers have more on-the-job opportunities to serve the public interest than less educated workers. Our results are in line with this, see Table 6 column 1 and 2. We find that for the subsample of highly educated workers, working in the public sector goes hand in hand with a bigger drop in charitable donations, which remains substantial (but loses significance) even when we control for income. In the third and fourth column of Table 6, we analyze the subsample of male workers. Male and female workers may differ in their cost of effort at work (measured by θ) because women tend to perform more household work and child care. As a result, the difference between charitable donations made by regular workers and public service workers may be bigger for male workers than for female workers, see (2), (3), and (4), or see Figure 1. The results in the third and fourth column of Table 6 are in line with this.

Lastly, we examine selection into type of job. Table 7 reports the re-

¹⁵The other industries are: Agriculture, Fisheries, Energy/Water, Mining, Chemicals, Synthetics, Earth/Clay/Stone, Iron/Steel, Mechanical Engineering, Electrical Engineering, Wood/Paper/Print, Clothing, Food, Construction, Wholesale, Trading Agents, Retail, Train System, Postal System, Other transport, Financial Institutions, Insurance, Restaurants, Service Industries, Trash Removal, Legal Services, Other Services, Church, Private Household.

sults of a linear probability model similar to Dur and Zoutenbier (2015), where the dependent variable in column 1 is employment in the public sector whereas the dependent variable in column 2 is holding a job in health, sport, education, or public administration. In addition to altruism and the usual demographics, we follow Dur and Zoutenbier by including two other self-reported preference measures: laziness and risk aversion. In line with prediction 3, we find in column 1 that workers with stronger altruistic preferences are more likely to end up in the public sector, though the coefficient is marginally insignificant ($p=0.104$). We find a much higher and significant estimate when employing the alternative definition of a public service job, see column 2. For each point increase on the altruism scale, the likelihood of employment in health, education, or public administration increases by 3.3 percentage points, which is sizeable given the average likelihood of having such a job of 33.0%. These results as well as the other coefficients are well in line with Dur and Zoutenbier (2015), who used an earlier wave of the German Socio-Economic Panel. It is worth noting that the coefficient for the worker’s laziness is marginally insignificant ($p=0.109$ and $p=0.105$, respectively).

5 Concluding Remarks

We have studied the role of a worker’s altruistic preferences in occupational choice, on-the-job effort provision, and donations to charity. We developed a simple model producing three key predictions: 1) Given job type, workers with stronger altruistic preferences make higher donations to charity; 2) Given a worker’s altruism, those working in a public service job (i.e. a job that involves making a contribution to society) donate less than workers in a regular job; and 3) Workers with stronger altruistic preferences are more likely to take a public service job. We examined data from the German Socio-Economic Panel Study – which contains rich data on (self-reported) altruism, charitable donations, and job type – and found support for our predictions, though some results are not significant. Our analysis implies that we should be careful with using charitable donations as a proxy for altruistic preferences in studies that compare workers in different sectors. Indeed, our theory predicts and the evidence indicates that workers in public service jobs are more altruistic, and yet make smaller donations to charity than their empirical counterparts in regular jobs. The reason suggested by our theory is a simple substitution argument: Since workers in public service jobs serve the pub-

lic interest on the job, they are less inclined to make substantial charitable donations.

In our theoretical model, workers differed not only in altruism, but also in their preference for other job (dis)amenities specific to public service jobs, such as job protection or flexible working hours. In future work, we wish to study how the provision of these (dis)amenities affects the self-selection of worker types to public service jobs. Another interesting avenue for theoretical research would be to allow for heterogeneity in sector-specific ability. In such a model, some highly altruistic workers may forego the opportunity to serve the public interest in a public sector job, because their high productivity – and hence high earnings – in the private sector enable them to serve the public interest better by making high donations to charity. There is some anecdotal evidence for this.¹⁶

Regarding empirical work, it would be interesting to follow workers over time, in particular when they switch job types for exogenous reasons, or experience a change in the mission of the organization they work for (as in Zoutenbier 2016). The release of the next wave of the SOEP may provide opportunities to do so. In Van Lent (2017), one of us exploits Dutch panel data in order to test whether there is substitutability between workers' contributions to other peoples' well-being on the job and volunteering activities outside of work. Two sources of variation in workers' opportunities to help others on the job are exploited: i) variation arising from job switches and ii) plausibly exogenous changes in workers' match of mission preferences with their employer. The results are broadly in line with the results we reported in this paper. Finally, the lab may also provide a useful test bed for more directly testing the substitutability between on-the-job contributions to society and charitable donations (see e.g. Gerhards 2015, Banuri and Keefer 2016, Cassar 2016b, and Carpenter and Gong 2016).

¹⁶The New York Times (4 April 2015) reports about Matt Wage who took a job at an arbitrage trading firm on Wall Street. "Wage reasoned that if he took a high-paying job in finance, he could contribute more to charity. Sure enough, he says that in 2013 he donated more than \$100,000, roughly half his pretax income."

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Tables and Figures

Table 1: Opportunities to help others and to be useful to society on the job, by sector (mean values on a 5-point scale).

	Full sample	Public sector	Private sector	t-test: p-value
How important is...				
... a job that allows someone to help others	3.98	4.11	3.91	0.00***
... a job that is useful to society	4.00	4.16	3.92	0.00***
In my job I can help other people	3.94	4.22	3.81	0.00***
My job is useful to society	3.96	4.34	3.79	0.00***
Observations	27,715	9,109	18,606	

Source: International Social Survey Program: Work Orientations 2015, ISSP Research Group (2017).

The questions that start with "How important ..." are measured on a 5-point scale where 1= Not at all important, 2= Not important, 3= Neither important nor unimportant, 4= Important, and 5=Very important. The questions that start with "[In] My job ..." are measured on a 5-point scale where 1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree, and 5= Strongly agree. *** p<0.01, ** p<0.05, * p<0.10.

Table 2: Descriptive Statistics

	Total	Public (26,2%)	Private(73.8%)
Donations: mean	111.20	121.95	107.37
standard deviation	522.26	411.40	556.38
Altruism (1): %	0.2	0.2	0.2
Altruism (2): %	6.6	5.2	7.1
Altruism (3): %	68.9	69.1	68.9
Altruism (4): %	24.3	25.5	23.8
Altruism: mean	3.17	3.20	3.16
standard deviation	0.54	0.53	0.54
Age: mean	45.5	46.4	45.2
standard deviation	11.1	10.8	11.2
Female: %	48.8	56.3	46.1
Yearly income: mean	21287.17	23077.86	20650.17
standard deviation	17324.48	12535.22	18694.91
Nr. of children in HH: mean	0.55	0.50	0.57
standard deviation	0.87	0.84	0.88
Married: %	64.2	64.5	64.1
Single: %	22.2	20.8	22.7
Widowed: %	1.6	1.5	1.7
Divorced: %	9.8	10.9	9.4
Separated: %	2.2	2.3	2.1
Education: less than HS: %	7.1	5.5	7.7
Education: HS: %	63.0	47.3	68.6
Education: more than HS: %	29.9	47.2	23.7
Tenure: mean	12.4	15.7	11.2
standard deviation	10.6	11.7	9.9
Religion: other religion: %	0.3	0.3	0.2
Islamic: %	1.8	1.0	2.1
Protestant: %	30.9	33.3	30.1
Catholic: %	28.0	30.2	27.3
Other christian: %	1.9	1.5	2.0
Not religious: %	37.1	33.7	38.3
Observations	7527	1975	5552

Table 3: Correlations

	1	2	3	4	5	6	7	8	9	10	11
1.Donation	1,000										
2.Public sector	0.012	1,000									
3.Altruism	0.023**	0.029**	1,000								
4.Age	0.118***	0.049***	-0.137***	1,000							
5.No. of children in HH	0.005	-0.034***	0.076***	-0.231***	1,000						
6.Female	-0.061***	0.089***	0.177***	-0.034***	-0.040***	1,000					
7.Income	0.378***	0.062***	-0.066***	0.154***	0.032***	-0.338***	1,000				
8.Marital Status	-0.037**	0.012	-0.005	-0.053***	-0.191***	0.067***	-0.050***	1,000			
9.Education	0.145***	0.202***	0.019*	0.088***	0.001	-0.043***	0.324***	-0.018	1,000		
10.Religion	-0.065***	-0.016	-0.062***	0.037**	-0.121***	-0.035***	0.057***	0.077***	0.070***	1,000	
11.Tenure in years	0.084***	0.186***	-0.085***	0.502***	-0.139***	0.113***	0.260***	-0.072***	0.056***	0.005	1,000

Note: correlations are calculated using 7527 observations; *, **, *** indicate significance at the 0.10, 0.05, 0.01 level, respectively.

Table 4: OLS regression comparing public and private sector workers.

Dependent variable: Donations		
Public Sector	-32.51** (14.08)	-1.57 (13.52)
Altruism (1)	-117.85 (123.72)	-81.55 (117.47)
Altruism (2)	-56.91** (24.02)	-58.86*** (22.81)
Altruism (4)	29.88** (14.12)	27.36** (13.40)
Age	-13.68*** (3.94)	-13.43*** (3.81)
Age*Age	0.21*** (0.04)	0.20*** (0.04)
No. of children	25.13*** (7.94)	16.35** (7.60)
Female	-52.30*** (12.24)	-14.26 (12.90)
Education: High School (HS)	30.77 (23.63)	24.02 (22.50)
Education: More than HS	195.88*** (25.17)	118.90*** (24.79)
Tenure in years	1.60** (0.66)	0.67 (0.66)
Constant	430.23*** (152.51)	425.80*** (145.10)
Control for Income	NO	YES
Control for marital status	YES	YES
Control for religion	YES	YES
Observations	7527	7527

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.10. Baseline category Altruism: 3, Education: Less than High School (HS). Income is included using 10 dummies for income categories with a range of 10,000, i.e. [0-10,000]; [10,001-20,000]; ...; [100,001 and higher].

Table 5: OLS comparing public service industries with the other industries.

Dependent variable: Donations		
Public Service	-13.72 (12.88)	-1.11 (12.34)
Altruism (1)	-117.38 (121.00)	-83.71 (115.66)
Altruism (2)	-51.11** (23.04)	-54.08** (22.03)
Altruism (4)	32.53** (13.54)	29.70** (12.94)
Age	-17.58*** (3.81)	-17.29*** (3.70)
Age*Age	0.26*** (0.04)	0.24*** (0.04)
No. of children	27.05*** (7.63)	18.26** (7.35)
Female	-49.58*** (12.04)	-11.66 (12.69)
Education: High School (HS)	33.83 (22.74)	25.61 (21.80)
Education: More than HS	185.73*** (24.38)	113.97*** (24.19)
Tenure in years	1.47** (0.62)	0.70 (0.63)
Constant	468.98*** (148.71)	476.22*** (142.46)
Control for Income	NO	YES
Control for marital status	YES	YES
Control for religion	YES	YES
Observations	7348	7348

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Baseline category Altruism: 3, Education: Less than High School (HS). Income is included using 10 dummies for income categories with a range of 10,000, i.e. [0-10,000]; [10,001-20,000]; ...; [100,001 and higher].

Table 6: OLS regression comparing public and private sector workers.

Dep. variable: Donations	Sample: Highly Educated		Sample: Males	
Public Sector	-92.27** (39.27)	-23.84 (37.77)	-75.68*** (27.37)	-18.34 (25.86)
Altruism (1)	-99.46 (498.50)	-37.91 (467.92)	-124.94 (174.79)	-87.90 (163.47)
Altruism (2)	-139.01* (75.90)	-158.54** (71.27)	-65.44* (37.66)	-67.50* (35.24)
Altruism (4)	73.47* (43.35)	68.14* (40.71)	46.20 (28.72)	43.85 (26.88)
Age	-26.04** (12.85)	-38.21*** (12.24)	-21.43*** (6.897)	-23.55*** (6.69)
Age*Age	0.41*** (0.13)	0.52*** (0.13)	0.32*** (0.07)	0.32*** (0.07)
No. of children	42.17* (23.51)	27.17 (22.32)	20.01 (14.40)	2.50 (13.56)
Female	-121.34*** (38.07)	-21.59 (39.73)		
Education: High School (HS)			34.40 (47.34)	25.63 (44.34)
Education: More than HS			263.55*** (50.28)	130.70*** (48.85)
Tenure in years	3.00 (2.15)	1.28 (2.10)	1.70 (1.18)	0.55 (1.16)
Constant	475.58 (531.72)	573.24 (500.95)	787.02*** (275.76)	793.54*** (259.56)
Control for Income	NO	YES	NO	YES
Control for marital status	YES	YES	YES	YES
Control for religion	YES	YES	YES	YES
Observations	2,247	2,247	3,857	3,857

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Baseline category Altruism: 3, Education: Less than High School (HS). Income is included using 10 dummies for income categories with a range of 10,000, i.e. [0-10,000]; [10,001-20,000]; ...; [100,001 and higher].

Table 7: Linear probability model of selection of workers

Dependent variable:	Public sector	Public service
Altruism	0.015 (0.009)	0.033*** (0.010)
Laziness	0.005 (0.003)	0.006 (0.003)
Risk aversion	0.011*** (0.002)	0.008*** (0.002)
Age	0.007** (0.003)	-0.004 (0.003)
Age*Age	0.000** (0.000)	0.000 (0.000)
Female	0.069*** (0.010)	0.213*** (0.011)
German nationality	0.082*** (0.026)	0.076*** (0.027)
No. of children	-0.019*** (0.007)	-0.007 (0.007)
Education: High School (HS)	-0.015 (0.020)	0.033 (0.021)
Education: More than HS	0.205*** (0.021)	0.301*** (0.022)
Constant	-0.132 (0.094)	0.047 (0.099)
Control for marital status	YES	YES
Control for region	YES	YES
Observations	7470	7240

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Baseline category Altruism: 3, Education: Less than High school (HS).

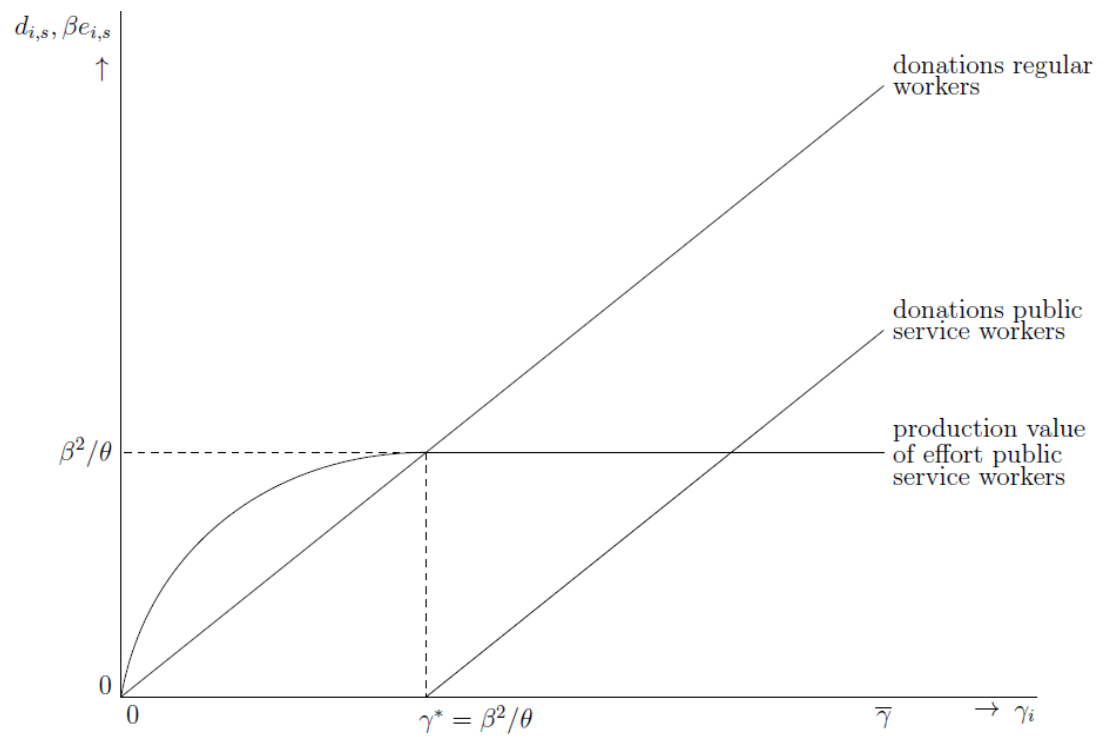


Figure 1: Contributions to the public interest by regular and public service workers for all levels of worker's altruism γ_i .

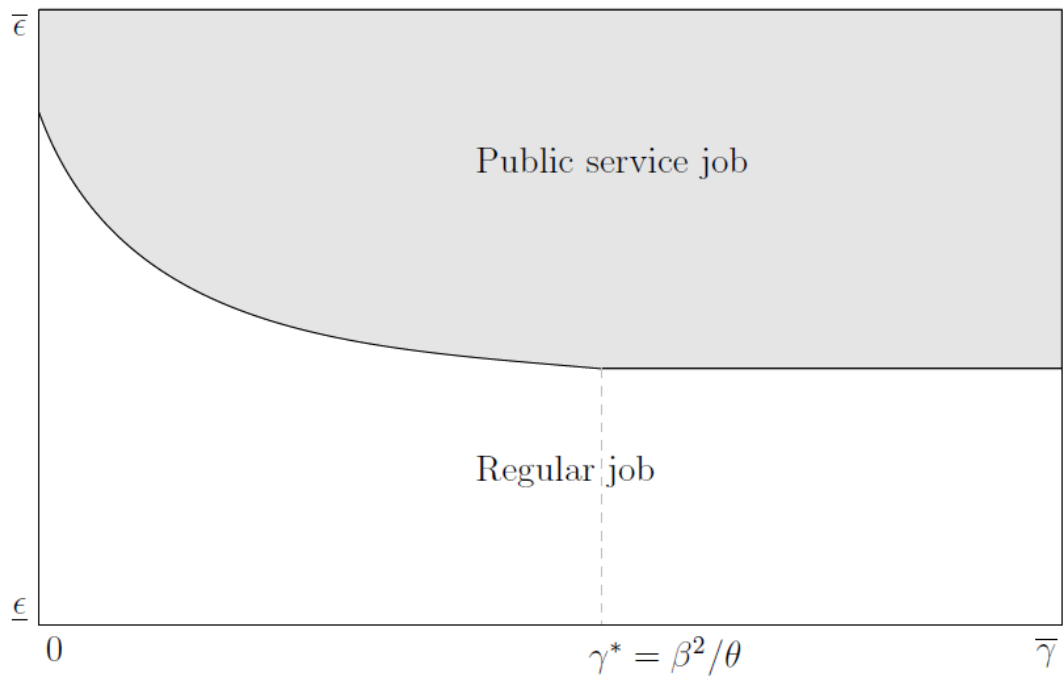


Figure 2: Worker's choice of job type

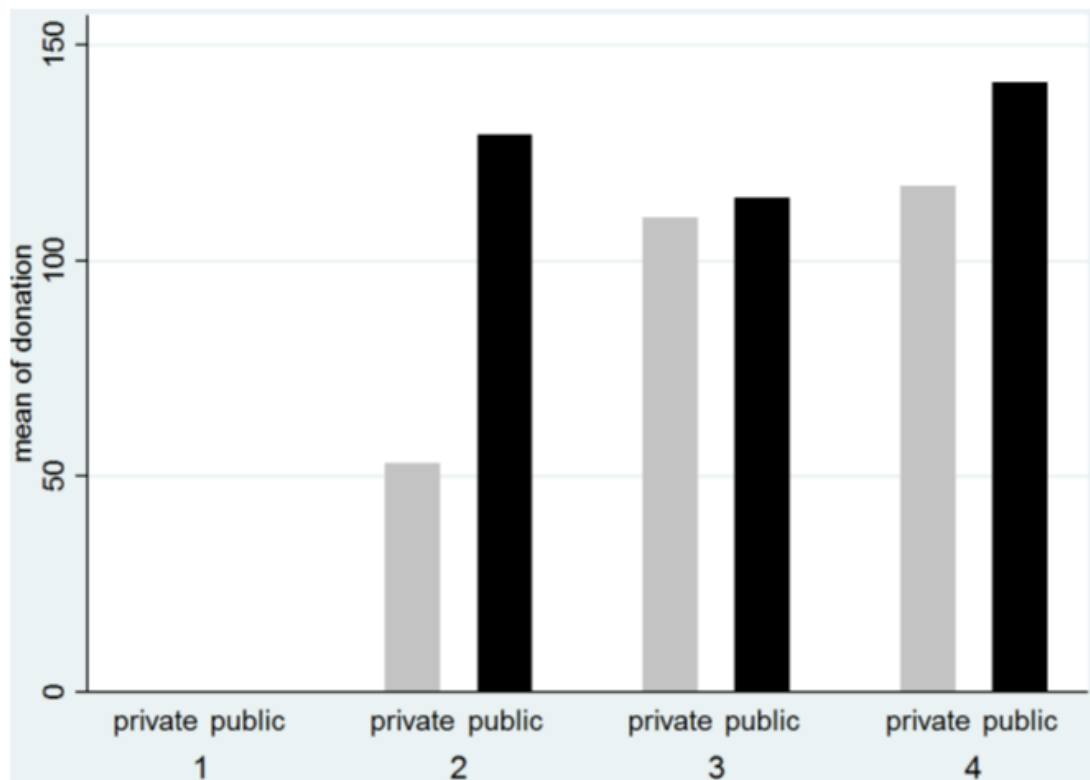


Figure 3: Mean of donations by altruism category and sector of employment. 1, 2, 3, 4 refer to the respondents' answers to the question: "How important are the following things [being there for others] currently for you?" Answers are given on a four point scale, ranging from "not at all important" (1) to "very important" (4).