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ABSTRACT

Intrinsic Motivations of Public Sector Employees: Evidence for Germany*

We examine differences in altruism and laziness between public sector employees and private sector employees. Our theoretical model predicts that the likelihood of public sector employment increases with a worker's altruism, and increases or decreases with a worker's laziness depending on his altruism. Using questionnaire data from the German Socio-Economic Panel Study, we find that public sector employees are significantly more altruistic and lazy than observationally equivalent private sector employees. A series of robustness checks show that these patterns are stronger among higher educated workers; that the sorting of altruistic people to the public sector takes place only within the caring industries; and that the difference in altruism is already present at the start of people's career, while the difference in laziness is only present for employees with sufficiently long work experience.

JEL Classification: H1, J45, M5

Keywords: public service motivation, altruism, laziness, sorting,
public sector employment, personality characteristics

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1 Introduction

Public sector organizations often strive for multiple goals, most of them being difficult to describe in an objective and precise way (Dixit 2002). The multitude and vagueness of public sector organization's goals are also reflected in the way performance of employees is assessed in the public sector. As compared to employees in the private sector, performance assessment in the public sector is relatively rare and, if it exists, often tied to weaker incentives (Burgess and Metcalfe 1999). As a result, performance of employees in the public sector relies much more on intrinsic motivations than on extrinsic incentives. A key issue therefore is what types of intrinsic motivations are prevalent among public sector employees.

A rich empirical literature in public administration and a recent theoretical literature in economics have addressed this issue. A key finding from the public administration literature is that more altruistic people are more likely to end up in a public-sector job.¹ The economics literature has studied the interplay between employee compensation packages and self-selection of people with different motivations to the public sector.² A common finding is that the public sector can promote self-selection of motivated or altruistic employees by offering low pay (Handy and Katz 1998, Delfgaauw and Dur 2007). Further, several studies have shown that, even if performance assessment in the public sector is perfectly feasible, it can be optimal to provide weak incentives to employees in the public sector so as to extract rents (Besley and Ghatak 2005, Delfgaauw and Dur 2007, Francois 2007). Providing weak incentives may, however, also imply that the public sector becomes an attractive employer for lazy people (Delfgaauw and Dur 2008).

This paper examines differences in altruism and laziness between employees in the public sector and the private sector. We start our analysis by developing a simple model of sorting to the public sector in an economy

¹See among others Rainey (1982), Crewson (1997), Houston (2000 and 2006), Brewer (2003), Lewis and Frank (2002), and Frank and Lewis (2004). Perry et al. (2010) provide an overview of this literature.

²See among others Handy and Katz (1998), Francois (2000 and 2007), Besley and Ghatak (2005), Prendergast (2007), Delfgaauw and Dur (2007 and 2008), Nyborg and Brekke (2011), and Buurman and Dur (2012). Francois and Vlassopoulos (2008) provide an overview of this literature.

where workers differ in altruism and laziness. In line with the evidence cited above, we assume that in a public sector job, extrinsic rewards for performance are relatively low (because performance is more difficult to measure) while intrinsic rewards for performance are relatively high (because of the opportunity to contribute to other people's welfare in a public sector job). Our theoretical analysis predicts that a worker's likelihood of working in the public sector increases with his altruism, and increases or decreases with his laziness depending on his altruism. Altruism induces sorting to the public sector because public sector jobs offer an opportunity to contribute to other people's welfare. Laziness has a more indirect effect on sorting. As lazy people find it costly to work hard, their choice of sector is not so much driven by sectoral differences in rewards for performance, but more by sectoral differences in other benefits and costs that are unrelated to effort. Hence, for selfish workers, the likelihood of working in the public sector increases with laziness, because more lazy workers more likely forego the high extrinsic rewards for performance in the private sector to enjoy public sector benefits that are unrelated to effort (among others the base salary). The opposite holds for highly altruistic workers who find effort more rewarding in the public sector than in the private sector. When such highly altruistic workers are more lazy, they more likely forego the high intrinsic rewards for performance in the public sector in return for private sector benefits unrelated to effort. Hence, our theory predicts a negative interaction effect between a worker's altruism and laziness. Depending on the exact parameter values, either workers who are altruistic and energetic or workers who are altruistic and lazy are most likely to sort to a public-sector job. Workers who are selfish and energetic are always least likely to sort to the public sector.

We test our theoretical predictions using data from the German Socio-Economic Panel Study (SOEP). The SOEP is a yearly panel that started in 1984 and now covers over 11.000 German households (see Wagner et al. 2007). The rich set of personality measures and demographic variables in the SOEP offers a rare opportunity to study sorting of altruistic and lazy workers to the public sector. Following Becker et al. (2012), our measure for altruism is the worker's response to the survey question: How important is it for you to "be there for others"? This question was included in the 2004-wave. Our measure for laziness comes from the 2005-wave and is given by the worker's response to the statement: "I see myself as someone who tends to be lazy." We examine how these self-reported personality characteristics are related to

sector of employment after controlling for a rich set of demographics.³

The results of our empirical analysis are as follows. In line with our predictions, we find that the likelihood of working in the public sector is positively and significantly related to a worker's altruism. A one standard-deviation increase in altruism results in a 1.3 percentage points higher probability of working in the public sector. We find a similar result for a worker's laziness, both in size and statistical significance. A one standard-deviation increase in laziness results in a 1.4 percentage points higher probability of working in the public sector. In contrast to our predictions, we find no evidence for an interaction effect between a worker's altruism and laziness. The estimate of the interaction effect is insignificant and very close to zero. Our estimates imply that workers who are both altruistic and lazy have the highest likelihood of ending up in the public sector. The predicted probability of a highly altruistic and highly lazy worker of working in the public sector is 33%. Workers who are selfish and highly energetic are least likely work in the public sector, with a predicted probability of 20%.

Next, we do a series of robustness checks. First, we check whether the results are similar across education levels. In line with previous work for other countries (Lewis and Frank 2002, Dur and Zoutenbier 2014), we find stronger effects of altruism (and also of laziness) for better educated workers, with point estimates that are twice as large as those for the full sample. Next, following Gregg et al. (2011), we examine in how far our results are driven by the overrepresentation of 'caring' jobs in the public sector. Restricting the sample to employees in caring industries, we find that altruism becomes twice as important for sorting to the public sector, while we find no change in the importance of laziness (though the effect is no longer statistically significant). For employees in non-caring industries, we find positive and significant sorting of lazy people to the public sector, but no sorting of altruistic people. These results nicely complement those of Gregg et al. (2011) for the UK, who exploit panel data on self-reported unpaid overtime of employees in for-profit and not-for-profit caring and non-caring industries.

³One may wonder whether respondents always truthfully report such personality characteristics and, in particular, whether truth-telling might be correlated with sector of employment. While our data do not allow us to correct for such possible biases, a recent incentivized experiment by Abeler et al. (2014) finds among a representative sample of the German population that participants forego considerable amounts of money to avoid lying. Moreover, lying appears to be uncorrelated with sector of employment (personal communication with Johannes Abeler).

Lastly, we examine whether the sorting patterns that we find are mainly the result of self-selection at the beginning of people’s career, or whether the sorting patterns become more pronounced for more experienced employees. Work experience may affect sorting patterns for two reasons. First, initial years of people’s careers may be spent on ‘job shopping,’ with many people holding jobs that are not a good match with their tastes and abilities (as in the models by Johnson 1978, Jovanovic 1979, and Neal 1999). As a result, we would expect weaker sorting patterns for employees with shorter work experience. Second, employees’ preferences may adapt to experience, for instance as a result of organizational socialization (Brewer 2008). Such preference adaptation may result in stronger or weaker sorting patterns depending on how entrants’ attitudes differ from the prevailing organizational culture. Previous empirical work has found a decline in altruistic motivations with tenure among public sector employees (Blau 1960, Van Maanen 1975, Moynihan and Pandey 2007, De Cooman et al. 2009, and Buurman et al. 2012). We do not find a similar pattern in our data. Public sector employees are more altruistic as compared to their private sector counterparts at the start of their career, and by and large it remains like this throughout their career. However, we do find a striking pattern for laziness, with small differences between the public and private sector early in people’s career, and big differences later on. To what extent these differences are driven by early-career job shopping or preference adaptation is, unfortunately, hard to uncover due to the cross-sectional nature of our data.

The SOEP data have been used previously to examine sorting of workers to the public sector. Pfeifer (2011) focuses on risk attitude and finds clear evidence that people who are more risk averse are more likely to sort to the public sector. We include risk attitude as a control variable in our regressions and find a similar result. In addition to risk attitude, Dohmen and Falk (2010) take up a number of broad measures of people’s preferences and personality, such as (positive and negative) reciprocity, trust, and all of the ‘Big Five’ personality indicators. Likewise, Luechinger et al. (2010) include the self-assessed importance of ‘having a successful career’ and ‘being engaged in social and political activities’. In contrast to these studies, our empirical analysis is – inspired by our theory – confined to the role of more narrowly defined facets of personality, namely altruism and laziness. While the use of broad personality measures such as Big Five is quite common (see e.g. the reviews by Almlund et al. 2011 and Becker et al. 2012), these measures have been criticized for being too blunt and for suppressing important

underlying facets of personality (Borghans et al. 2008: 1008-1009). Indeed, several studies in psychology find that underlying trait measures do a better job in predicting and explaining behavior and outcomes than the Big Five indicators (e.g. Paunonen and Ashton 2001 and Roberts et al. 2005). In line with these findings, we find pretty strong sorting to the public sector on the basis of the narrowly defined traits of altruism and laziness, whereas Dohmen and Falk (2010) and Luechinger et al. (2010) find much weaker and often insignificant patterns using broader measures of social preferences and conscientiousness.

While the main aim of our study is to contribute to the body of knowledge about the nature and origin of public sector worker’s motivations, we believe that our findings may also help policy makers to design better HR policies. By learning about employees’ intrinsic motivations, HR-specialists are better able to fine-tune personnel policies in the public sector to the special needs and wishes of the current workforce. Moreover, in the light of our findings, policy makers may wish to reconsider current personnel policies so as to attract and retain a differently motivated workforce in the future.

The remainder of the paper is organized as follows. In the next section, we develop and analyze a simple model of sorting and derive our key hypotheses. Section 3 describes the data and our empirical strategy. The results of the empirical analysis are presented in Section 4. Lastly, Section 5 concludes.

2 Theory

Building on Delfgaauw and Dur (2008), we develop a simple model of sorting to the public sector. Workers in our model are heterogenous in two ways: they differ in altruism, denoted by $\gamma_i \in [0, \bar{\gamma}] \geq 0$, and in laziness, denoted by $\theta_i \in [\underline{\theta}, \bar{\theta}] > 0$. Both characteristics are private information of the individual and are drawn from a continuous distribution.⁴ As in Besley and Ghatak (2005) and Delfgaauw and Dur (2008), altruism in our model is of the impure form. That is, altruistic individuals care about their personal contribution to other people’s welfare, not about other people’s welfare per se (see Andreoni 1990). Tonin and Vlassopoulos (2010) provide field-experimental evidence supporting this assumption.

⁴This contrasts Delfgaauw and Dur (2008), who consider a three-type model (featuring motivated, regular, and lazy workers).

Workers choose their sector of employment, either the private sector or the public sector. The private sector is perfectly competitive such that workers are paid the full marginal product, denoted by p , for each unit of effort. For convenience, we abstract from opportunities to contribute to other people's welfare in the private sector, and so a worker's altruism γ does not affect his utility when working in the private sector.⁵ A worker's laziness θ enters the worker's utility function through the cost of effort, which is identical across sectors. The utility from working in the private sector is given by:

$$U^{private} = pe_i - \frac{\theta_i e_i^2}{2},$$

implying that optimal effort equals:

$$e_i^{private} = \frac{p}{\theta_i}.$$

By substituting optimal effort into the utility function, we obtain the indirect utility from working in the private sector for a worker of type (γ_i, θ_i) : $\frac{p^2}{2\theta_i}$. Thus, a worker's indirect utility from working in the private sector increases in the marginal product of effort and decreases in a worker's laziness.

In contrast to the private sector, a worker's effort in the public sector is unobservable. Hence, workers cannot be paid for performance and, instead, receive a base salary denoted by w .⁶ In addition, altruistic workers enjoy a nonpecuniary benefit equal to $\gamma_i e_i$ from making a contribution to public sector output. Thus, worker's utility from working in the public sector is given by:

$$U^{public} = w + \gamma_i e_i - \frac{\theta_i e_i^2}{2} - \varepsilon_i,$$

implying an optimal level of effort equal to:

$$e_i^{public} = \frac{\gamma_i}{\theta_i}.$$

⁵Allowing for such opportunities (e.g. making charitable donations, volunteering) would not change our results as long as such contributions are not a perfect substitute for work effort in the public sector. For instance, a public sector job may simply make it more easy or less costly to contribute to other people's welfare. Huck and Rasul (2010) provide convincing evidence for substantial transaction costs in making charitable donations.

⁶Complete absence of performance-related pay is, of course, an extreme assumption and made for convenience only. All of our results hold as long as incentive pay is weaker in the public sector than in the private sector.

The stochastic term ε_i captures an individual-specific difference in utility when employed in the public sector rather than in the private sector. It is drawn from a distribution with CDF $F(\varepsilon) = \Pr(\varepsilon_i \leq \varepsilon)$, PDF $f(\varepsilon) > 0$, and boundaries $\varepsilon \in [\underline{\varepsilon}, \bar{\varepsilon}]$ such that there is some variation in sector choice for each possible worker type (γ, θ) . We do not restrict ε to be positive. That is, ε could just as easily be added to the private sector utility.⁷ Substituting optimal effort into the utility function gives the indirect utility of working in the public sector for a worker of type (γ_i, θ_i) : $w + \frac{\gamma_i^2}{2\theta_i} - \varepsilon_i$. Hence, a worker's indirect utility from working in the public sector is increasing in his altruism and decreasing in his laziness.

A worker joins the public sector when the utility from working in the public sector is higher than or equal to the utility from working in the private sector:

$$w + \frac{\gamma_i^2}{2\theta_i} - \varepsilon_i \geq \frac{p^2}{2\theta_i}.$$

Hence, the fraction of workers of type (γ_i, θ_i) who choose to work in the public sector is given by:

$$\Pr(\varepsilon_i \leq w + \frac{\gamma_i^2 - p^2}{2\theta_i}) = F(w + \frac{\gamma_i^2 - p^2}{2\theta_i}).$$

It immediately follows that the likelihood of choosing a job in the public sector increases in altruism γ_i :

$$\frac{\partial F(\cdot)}{\partial \gamma_i} = \frac{\gamma_i}{\theta_i} f(w + \frac{\gamma_i^2 - p^2}{2\theta_i}) > 0.$$

The intuition is straightforward: Higher altruism implies that a job in the public sector becomes intrinsically more rewarding and, hence, more attractive. The effect of a worker's laziness θ_i on the likelihood of choosing a public sector job is described by:

$$\frac{\partial F(\cdot)}{\partial \theta_i} = \frac{p^2 - \gamma_i^2}{2\theta_i^2} f(w + \frac{\gamma_i^2 - p^2}{2\theta_i}).$$

Hence, for relatively selfish workers (those with $\gamma_i < p$), the likelihood of public sector employment increases with laziness, while the reverse holds

⁷As will become clear, our predictions on altruism and laziness are independent of ε . The ε term only has a level effect on the likelihood of public sector employment.

for highly altruistic workers (those with $\gamma_i > p$). The intuition is as follows. Workers choose sector by comparing extrinsic and intrinsic rewards for performance (p and γ_i) and other individual-specific sector benefits that are unrelated to effort or performance (the stochastic term ε_i and the base salary). The latter benefits are more important for sector choice of more lazy workers. The reason is that lazy people find it costly to work hard and so they gain less utility when effort becomes more rewarding (intrinsically or extrinsically). Consequently, a selfish worker's likelihood of working in the public sector increases in his laziness, because a more lazy worker more likely foregoes the extrinsic rewards for performance in the private sector to enjoy the public sector's benefits that are unrelated to effort. The opposite holds for a highly altruistic worker. His likelihood of choosing the public sector decreases with his laziness, as a more lazy worker more likely chooses to forego the high intrinsic rewards for performance in the public sector to enjoy the private sector's benefits that are unrelated to effort (represented by ε_i).

Combined these comparative statics imply that workers who are selfish and energetic are least likely to sort to the public sector. If the type space is sufficiently rich (more precisely, if $\bar{\gamma} > p$), then workers who are altruistic and energetic are most likely to work in the public sector, followed by workers who are altruistic and lazy. This is illustrated in Figure 1.⁸ If the type space is smaller such that $\bar{\gamma} < p$, then the effect of laziness on the likelihood of public sector employment is positive for all possible values of altruism. Hence, in that case, workers who are altruistic and lazy are most likely to sort to the public sector, see Figure 2.

3 Data and empirical strategy

We test our predictions using data from the German Socio-Economic Panel study (SOEP), conducted by the German Institute for Economic Research (DIW Berlin). The SOEP is an unbalanced panel, containing yearly survey data. The first wave was conducted in 1984. The survey includes questions on employment, earnings, health, and – in recent waves – a rich set of personality measures. The SOEP covers over 11.000 German households and 20.000

⁸In creating Figure 1 (and Figure 2) the stochastic term ε is assumed to follow a continuous uniform distribution on the interval $[\underline{\varepsilon}, \bar{\varepsilon}]$. The figures look similar with other distributions as long as second-order effects through $f'(\cdot)$ are not dominant.

people living in these households.⁹

Our key variables of interest are questions on stated altruism, laziness, and sector of employment. We measure altruism by the response to the question: "[How important] are the following things (Be there for others) currently for you?" Respondents rated themselves on a four-point scale, ranging from "not at all important" to "very important".¹⁰ Laziness is measured by the response to the statement: "I see myself as someone who tends to be lazy". The response is measured on a seven-point scale ranging from "does not apply to me at all" to "applies to me perfectly".¹¹ Lastly, respondents indicated whether they are employed in the public sector by the question: "Does the company in which you are employed belong to the public sector?" A limitation of the dataset is that we cannot infer whether a worker who does not work in the public sector is employed in a for-profit or not-for-profit organization. If not-for-profit organizations offer similar types of jobs as the public sector, our coefficients of interest are biased towards zero.

We restrict our analysis to respondents from the 2005 wave, because previous waves do not contain questions on a worker's laziness. The data on a worker's altruism are taken from the 2004 wave, because the question on altruism was not included in 2005. From the 2005 wave we select all workers (including self-employed workers) who answered the question on altruism in 2004 and who indicate that they are working in either the public sector or the private sector, resulting in a sample of 10.819 workers of whom 2.824 (26.1%) are employed in the public sector and 7.995 (73.9%) are employed in the private sector.

We use a Linear Probability Model to estimate the probability that a worker with given altruism and laziness is employed in the public sector instead of the private sector.¹² We control for a number of demographics such as gender, age, education, nationality, marital status, number of children, and state of residence.¹³ Additionally, we control for worker's risk prefer-

⁹Detailed information about the SOEP can be found at www.diw.de/gsoep/.

¹⁰The same measure for altruism is used in Becker et al. (2012), who study the relation between economic preferences and personality measures from psychology.

¹¹Our measure for laziness is an underlying facet of one of the 'Big Five' personality measures. In the Introduction, we briefly discuss the pros and cons of using underlying facets.

¹²We use the Linear Probability Model for ease of interpretation. Our results are robust to different model specifications: Probit or Logit give similar results. Fewer than 1% of all predicted outcomes using the Linear Probability Model fall outside the [0,1] interval.

¹³States included in the analysis are Bavaria, Baden-Wuerttemberg, Berlin (East),

ences, as in Dohmen and Falk (2010), Luechinger et al. (2010), and Pfeifer (2011). The measure for risk preferences is taken from the 2004 wave and indicates a person's general aversion to risk as measured on an eleven-point scale by the response to the question "How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?". Dohmen et al. (2011) have validated this measure through incentivized experiments.

Our regression specification is:

$$\Pr(\text{Sector} = \text{public}) = \alpha + vA + \omega L + \varphi(A \times L) + x'\delta + \varepsilon,$$

where A represents our measure of altruism, L is our measure of laziness, and the vector x contains all control variables. In line with our theoretical model we expect a positive effect of laziness ($\omega + \varphi \times A > 0$) for low values of altruism and a negative effect of laziness ($\omega + \varphi \times A < 0$) for high values of altruism. This implies that the conditional effect of laziness should be positive, $\omega > 0$, and the interaction effect of altruism and laziness should be negative, $\varphi < 0$. Next, we expect a positive effect of altruism for all values of laziness ($v + \varphi \times L > 0$); that is, we expect $v > 0$ to be sufficiently large as compared to $\varphi < 0$.

Table 1 shows the descriptive statistics of the sample. Public sector workers score themselves slightly higher as compared to private sector workers on altruism, laziness, and risk aversion. There are considerable differences between public sector workers and private sector workers in socio-demographic variables. Public sector workers are on average more likely to be female, older, higher educated, a German citizen, married, and have less children as compared to private sector workers. Table 2 shows correlations between the independent variables. Laziness shows a small but significant negative correlation with both altruism and risk aversion. The correlation between altruism and risk aversion is insignificant. Further, the table shows that our personality characteristics correlate with gender and age, suggesting that it is important to control for these demographics in the regression.

Berlin (West), Brandenburg, Bremen, Hamburg, Hessen, Lower Saxony, Mecklenburg-Vorpommern, North-Rhine-Westfalia, Rheinland-Pfalz, Saarland, Saxony, Saxony-Anhalt, Schleswig-Holstein, and Thuringa.

4 Results

Table 3 shows the estimation results of the linear probability model using the full sample. The coefficient estimates show the change in the decimal probability of working in the public sector instead of the private sector given a unit change in the independent variable. We report robust standard errors to correct for heteroskedasticity resulting from the binary structure of our response variable.

The first column shows the estimation results without taking up any control variables as well as without allowing for a possible interaction effect between altruism and laziness. The estimation results show that the likelihood that a worker is employed in the public sector is increasing in his altruism. This effect is positive and significant. A unit increase in altruism increases the likelihood of working in the public sector instead of the private sector by 3.3 percentage points. We find a weaker result for laziness. A unit increase in laziness has a positive but insignificant effect ($p = 0.117$) of 0.5 percentage points on the likelihood of working in the public sector.¹⁴

Next, we control for socio-demographics and risk preferences in column 2. The effect of a worker's altruism is robust in both sign and significance; the magnitude of the effect slightly decreases from 3.3 to 2.4 percentage points. We now also find a positive and highly significant effect of a worker's laziness on sector of employment. A unit increase in laziness results in a 0.9 percentage points increase in the likelihood of working in the public sector. The increase in the magnitude of the coefficient stems mainly from the inclusion of age and gender as control variables. Older people and females on average claim to be less lazy (see Table 2) as well as have a higher likelihood of working in the public sector (see Table 1). Omission of these control variables gave rise to a downward bias in the coefficient for laziness in column 1.

As discussed in the previous section, altruism is measured on a four-point scale whereas laziness is measured on a seven-point scale. We compare the effect size of altruism and laziness by computing standardized coefficients. We estimate the effect of a one standard deviation change in the independent variable on the likelihood of working in the public sector. We find that the effect sizes of altruism and laziness are similar in magnitude. An increase by one standard deviation in altruism results in a 1.3 percentage points in-

¹⁴We have checked for nonlinear effects of altruism and laziness on the likelihood of working in the public sector and found no significant nonlinear effects.

crease in the probability of working in the public sector. A one standard deviation increase in laziness results in a 1.4 percentage points increase in the probability of working in the public sector. These results suggest that altruism and laziness are equally important in determining a worker’s sector of employment.

Several of our control variables turn out to be important in explaining a worker’s sector of employment. In line with the literature on risk preferences, we find that workers who are more risk averse are significantly more likely to work in the public sector instead of the private sector. A unit increase in risk aversion results in a 0.5 percentage points higher likelihood of working in the public sector. This corresponds to a standardized effect size that is slightly smaller than the standardized effect sizes for altruism and laziness. Additionally, we find that public sector employees are more likely to be female, older, better educated, and have fewer kids. The state dummies, which control for unobserved heterogeneity between states, are jointly significant ($p < 0.01$).

Column 3 of Table 3 adds the interaction of altruism and laziness. In contrast to our theoretical predictions, we do not find evidence for an interaction effect between a worker’s altruism and laziness. The estimate of the coefficient is insignificant and very close to zero.¹⁵ The marginal effect of altruism on the likelihood of public sector employment does not change with laziness, as illustrated in Figure 3. Likewise, the marginal effect of laziness on the likelihood of public sector employment does not change with altruism, see Figure 4. This implies that not the most altruistic and energetic workers have the highest likelihood of being employed in the public sector, but those workers who are most altruistic and lazy. Our estimates imply that they face an estimated probability of working in the public sector of 32.8%.¹⁶ Workers who are most altruistic and energetic are significantly less likely to work in the public sector with an estimated probability of working in the public sec-

¹⁵One possible interpretation for the insignificant coefficient for the interaction term together with the significant coefficient for altruism is that public sector employees’ contribution to society is (partly) independent of their effort. For instance, public sector employees may consider the wage gap between the private sector and the public sector as a donation to society. This interpretation fits well with Perry and Wise (1990)’s classic typology of public service motivation that includes both the “desire to serve” as well as the “desire to participate”, where the former depends on a worker’s effort while the latter does not. A recent economic model including both types of public service motivation is Delfgaauw and Dur (2010).

¹⁶Predicted probabilities are calculated given the mean values of all control variables. Significance levels ($p < 0.01$) are calculated using delta method standard errors.

tor of 27.1%. This probability does not differ significantly ($p > 0.10$) from the corresponding probability for workers who are most selfish and lazy, who face an estimated probability of working in the public sector of 25.7%. Workers who are most selfish and energetic are least likely to sort to the public sector, with an estimated probability of 20%.

Recent literature suggests that intrinsic motivation is a more important determinant of sorting to the public sector for higher educated workers (Lewis and Frank 2002, Dur and Zoutenbier 2014). We find evidence in line with these studies for altruism and laziness. Table 4 shows the regression results for subsamples of each category of education. Neither a worker's altruism nor laziness has a significant effect on sector of employment for workers with less than high school education. We do find some evidence for sorting of altruistic workers and lazy workers to the public sector among high-school graduates. We find the strongest results for workers in the highest education category. A unit increase in altruism given median laziness (altruism and laziness are median centered) increases the likelihood of working in the public sector for a highly educated worker by 3.5 percentage points. A unit increase in laziness given median altruism increases the likelihood of working in the public sector for a highly educated worker by 1.7 percentage points. The estimated interaction effect of altruism with laziness is insignificant in all education subsamples. A possible reason why altruism matters more for the sorting of higher educated workers lies in the nature of their job, with higher educated workers having more opportunities to make a significant contribution to society in a public sector job. Laziness may matter more for the sorting of higher educated workers because in Germany extrinsic rewards for performance are generally rare among less educated workers and more prevalent among better educated workers (see tables 3 and 4 in Dur et al. 2010). We find some further support for this interpretation from our result that risk aversion only matters for sector of employment of the highly educated workers. The signs and significance of the other control variables are fairly similar across all levels of education, aside from risk aversion.

Next, we examine heterogeneity in sorting to the public sector between industries. Relatively many jobs in the public sector involve taking care for people. Our estimates of sorting to the public sector may be confounded if altruistic (and/or lazy) workers have a particular tendency to take a job in a caring industry. Following Gregg et al. (2011), we have constructed two

subsamples: the caring industries and the non-caring industries.¹⁷ Table 5 reports the regression results for these subsamples. While the coefficients for laziness hardly differ between industries, there is a big difference between industries in sorting of altruistic workers to the public sector. As compared to the full sample, the sorting of altruistic workers to the public sector is much stronger in the caring industries and is virtually absent in the non-caring industries. These results nicely fit with those of Gregg et al. (2011) for the UK. As in the full sample, we do not find significant interaction effects of altruism and laziness in the subsamples.

Finally, we explore whether the differences in altruism and laziness that we have found are more or less pronounced for more experienced employees. As discussed in the Introduction, sorting may be related to work experience in two important ways. First, workers might spend time at the start of their career on finding a job that is a good match with a workers' tastes and abilities (as in the 'job shopping' models by Johnson 1978, Jovanovic 1979, and Neal 1999). Following this line of reasoning we expect weaker sorting patterns for workers with little work experience. Second, sorting patterns may also be stronger or weaker for more experienced workers when workers adapt their preferences to the prevailing organizational culture (see Brewer 2008). Following this line of reasoning workers become more or less altruistic and lazy by working in the public sector. In Table 6, we show the results of regressions that include an interaction of altruism and (full-time) work experience, and of laziness and (full-time) work experience (measured in years).¹⁸ The first column shows that a unit increase in altruism for workers with no work experience, results in a positive and significant effect of 2.7 percentage points on the likelihood of working in the public sector.¹⁹ This suggests that

¹⁷The following 2 digit industry classifications are labeled a caring industry: Education and Sport, Health Service, Service Industries, Voluntary Church, and Private Household. The remaining 2 digit industry classifications are labeled a non-caring industry: Agriculture and Forestry, Fisheries, Energy and Water, Mining, Chemicals, Synthetics, Earth, Clay and Stone, Iron and Steel, Mechanical Engineering, Electrical Engineering, Wood, Paper and Print, Clothing and Textile, Food Industry, Construction, Construction Related, Wholesale, Other Transport, Financial Institutions, Insurance, Restaurants, Trash Removal, Other Services, and Public Administration.

¹⁸Unfortunately, we only have data on worker's aggregate work experience, not on work experience within a sector.

¹⁹We additionally examined sorting by workers who started their career only after their altruism and laziness had been measured (that is, workers who took their first job between 2005 and 2010). This certainly precludes any feedback effects from working in a particular

altruistic workers already at the start of their career self-select to the public sector. We do not find a clear relation between a worker's altruism and work experience in the likelihood of public sector employment. The interaction effect of altruism and work experience is negative and insignificant. This result is in contrast with a number of previous studies that do find a significant decrease in public sector worker's altruism with work experience (Blau 1960, Van Maanen 1975, Moynihan and Pandey 2007, De Cooman et al. 2009, and Buurman et al. 2012). The second column allows the effect of altruism to depend nonlinearly on work experience.²⁰ The combined interaction effects are interpreted by looking at the marginal effect of altruism given the number of years of work experience. This marginal effect is illustrated in Figure 5. We find that even though the effect of a worker's altruism slightly declines with work experience in the first few years of a worker's career, the effect slightly increases in the last years of a worker's career. Hence, overall, there is not a very clear relation between a worker's altruism and his work experience. Public sector employees are more altruistic as compared to their private sector counterparts at the start of their career, and by and large it remains like this throughout their career. For laziness, we do find a striking pattern. Column 1 shows that the effect of a unit increase in laziness for workers with low levels of work experience is insignificant and very close to zero. However, the effect of laziness increases for workers with higher levels of work experience. The estimated interaction effect of laziness with work experience is 0.1 percentage points and significant. The second column adds an interaction between a worker's laziness and work experience squared. Figure 6 illustrates the estimated marginal effect of laziness including the interaction effects of laziness and work experience and laziness and work experience squared. We find that a worker's laziness becomes more important for sorting as work experience increases. Whether this stems from preference adaptation or delayed self-selection cannot be assessed due to the cross-sectional nature

sector on personality traits, but does pose difficulties in obtaining a sufficiently large sample size. The results of this estimation are very similar in sign and magnitude as compared to the estimates for workers with low levels of work experience in Table 6. However, we do not find statistically significant results, which could well be due to the very limited sample size.

²⁰We have also estimated our regression including nonlinear terms for altruism and laziness. We find no evidence of nonlinearities in altruism and laziness.

of our data.²¹

5 Concluding remarks

We have studied how intrinsic motivations of public sector employees compare to those of private sector employees using a representative sample of German workers. In line with our theoretical predictions, we have found that public sector employees are significantly more altruistic than private sector employees. This difference is already present at the start of people's career and is more pronounced among highly educated employees and in caring industries. We have also found that public sector employees are significantly more lazy than private sector employees. This difference only shows up for more experienced employees, which could be due to early-career 'job shopping' or to preference adaptation. Lastly, we did not find evidence for our theoretical prediction of a negative interaction between altruism and laziness in the sorting to the public sector, which may indicate that public sector employees' contribution to society is (partly) independent of their effort. Together these results imply that workers who are both highly altruistic and lazy have the highest likelihood of sorting to the public sector (with a predicted probability of 33%), whereas selfish and highly energetic workers have the lowest likelihood of sorting to the public sector (with a predicted probability of 20%).

A natural next step would be to include wages in the empirical analysis, as in the endogenous switching regression models by Van der Gaag and Vijverberg (1988), Hartog and Oosterbeek (1993), and Dustmann and Van Soest (1998). Our theory predicts that wages in the private sector decrease in a worker's laziness and are independent of his altruism, whereas public sector wages are flat. It would be interesting to learn how much of the differences in personality characteristics between public sector and private sector employees that we have found in this study can be attributed to differences in the wage returns to altruism and laziness between sectors. Such a study does pose the challenge of finding variables that are credibly exogenous to wage determination but not to selection (or the other way around).

²¹To be sure, the SOEP is a panel, but the survey question on laziness was included only recently.

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Tables

Table 1: Descriptive statistics

	Obs.	Public	Private	Total
Altruism	10819			
Mean		3.21	3.16	3.18
Standard deviation		(0.56)	(0.57)	(0.56)
Laziness	10819			
Mean		2.24	2.19	2.20
Standard deviation		(1.48)	(1.47)	(1.48)
Risk aversion	10574			
Mean		5.33	5.13	5.18
Standard deviation		(2.13)	(2.25)	(2.22)
Gender: % Female	10574			
Mean		0.57	0.43	0.47
Standard deviation		(0.50)	(0.50)	(0.50)
Age	10574			
Mean		44.47	42.05	42.68
Standard deviation		(10.80)	(11.51)	(11.38)
Education: % level	10574			
Less than High School		0.07	0.12	0.11
High School		0.47	0.67	0.61
More than High School		0.46	0.21	0.28
Nationality: % German	10574			
Mean		0.97	0.92	0.93
Standard deviation		(0.18)	(0.27)	(0.25)
Relationship status: % type	10574			
Single		0.21	0.26	0.25
Married		0.66	0.63	0.64
Widowed		0.02	0.02	0.02
Divorced		0.08	0.08	0.08
Separated		0.03	0.02	0.02
Number of children	10574			
Mean		0.58	0.66	0.64
Standard deviation		(0.88)	(0.96)	(0.94)
State categories	17			
Observations		2824	7995	10819

Table 2: Correlation table independent variables

	1	2	3	4	5	6	7	8
1. Altruism								
2. Laziness	-.068***							
3. Risk aversion	.016	-.067***						
4. Female	.147***	-.073***	.198***					
5. Age	-.072***	-.162***	.098***	-.039***				
6. Education	-.004	.024**	-.076***	-.049***	.209***			
7. Nationality	-.013	.029***	-.056***	.017*	.039***	.175***		
8. Relationship	-.001	-.100***	.034***	.062***	.374***	.037***	-.018*	
9. No. of children	.057***	-.016	.019*	-.049***	-.165***	.008	-.082***	.065***

Notes: Correlations calculated using 10574 observations. *, **, and *** indicate significance at the .10, .05, and .01 levels, respectively.

Table 3: Results of the Linear Probability Model (full sample)

Dependent variable: sector of employment			
	(1)	(2)	(3)
Altruism	0.033*** (0.007)	0.024*** (0.007)	0.024*** (0.007)
Laziness	0.005 (0.003)	0.009*** (0.003)	0.009*** (0.003)
Altruism \times Laziness			0.001 (0.005)
Risk aversion		0.005*** (0.002)	0.005*** (0.002)
Female		0.112*** (0.009)	0.112*** (0.009)
Age		0.009*** (0.002)	0.009*** (0.002)
Age ²		-0.000*** (0.000)	-0.000*** (0.000)
Education: High School (HS)		0.006 (0.013)	0.006 (0.013)
Education: More than HS		0.242*** (0.015)	0.241*** (0.015)
Nationality (=German)		0.092*** (0.014)	0.092*** (0.014)
Married		0.007 (0.014)	0.007 (0.014)
Widowed		-0.013 (0.036)	-0.013 (0.036)
Divorced		-0.010 (0.019)	-0.010 (0.019)
Separated		0.022 (0.032)	0.022 (0.032)
Number of children		-0.016*** (0.005)	-0.016*** (0.005)
Intercept	Yes	Yes	Yes
State dummies	No	Yes	Yes
Observations Dep=0	7995	7792	7792
Observations Dep=1	2824	2782	2782
Total Observations	10819	10574	10574
R ²	0.002	0.095	0.095
Log Likelihood	-6439	-5805	-5805

Notes: Heteroskedasticity robust standard errors between parentheses. Variables altruism and laziness in column (3) are centred around their sample median. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 levels, respectively.

Table 4: Results of the Linear Probability Model with the sample split on education level

Dependent variable: sector of employment			
	(1)	(2)	(3)
	Less than High School	High School	More than High School
Altruism	0.009 (0.017)	0.021** (0.009)	0.035** (0.017)
Laziness	0.005 (0.008)	0.006* (0.004)	0.017** (0.006)
Altruism \times Laziness	0.002 (0.011)	-0.005 (0.006)	0.013 (0.011)
Risk aversion	-0.002 (0.004)	0.002 (0.002)	0.018*** (0.004)
Female	0.126*** (0.022)	0.106*** (0.010)	0.132*** (0.019)
Age	0.017*** (0.006)	0.009*** (0.003)	0.016** (0.006)
Age ²	-0.000*** (0.000)	-0.000** (0.000)	-0.000** (0.000)
Education: High School (HS)			
Education: More than HS			
Nationality (=German)	0.052** (0.025)	0.093*** (0.017)	0.124*** (0.045)
Married	-0.064 (0.042)	-0.005 (0.016)	0.057* (0.029)
Widowed	0.002 (0.105)	-0.052 (0.042)	0.097 (0.088)
Divorced	-0.103** (0.052)	-0.011 (0.023)	0.024 (0.044)
Separated	-0.058 (0.094)	0.041 (0.040)	0.019 (0.063)
Number of children	-0.005 (0.013)	-0.007 (0.006)	-0.043*** (0.010)
Intercept	Yes	Yes	Yes
State dummies	Yes	Yes	Yes
Observations Dep=0	962	5184	1646
Observations Dep=1	188	1309	1285
Total Observations	1150	6493	2931
R ²	0.050	0.037	0.055
Log Likelihood	-458	-3162	-2022

Notes: Heteroskedasticity robust standard errors between parentheses. Variables altruism and laziness are centred around their sample median. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 levels, respectively.

Table 5: Results of the Linear Probability Model with the sample split on industry

Dependent variable: sector of employment		
	(1)	(2)
	Caring Industries	Non-Caring Industries
Altruism	0.039** (0.016)	0.003 (0.008)
Laziness	0.007 (0.007)	0.009*** (0.003)
Altruism \times Laziness	0.004 (0.010)	-0.002 (0.005)
Risk aversion	0.014*** (0.004)	0.003 (0.002)
Female	0.071*** (0.020)	0.046*** (0.010)
Age	0.023*** (0.006)	0.006** (0.003)
Age ²	-0.000*** (0.000)	-0.000** (0.000)
Education: High School (HS)	-0.006 (0.035)	0.021* (0.012)
Education: More than HS	0.127*** (0.036)	0.221*** (0.017)
Nationality (=German)	0.112*** (0.041)	0.078*** (0.013)
Married	-0.003 (0.030)	0.018 (0.014)
Widowed	-0.000 (0.075)	0.002 (0.037)
Divorced	-0.020 (0.041)	0.004 (0.020)
Separated	0.011 (0.063)	0.039 (0.036)
Number of children	-0.031*** (0.010)	-0.012** (0.005)
Intercept	Yes	Yes
State dummies	Yes	Yes
Observations Dep=0	1628	5883
Observations Dep=1	1494	1238
Total Observations	3122	7121
R ²	0.046	0.073
Log Likelihood	-2190	-2924

Notes: Heteroskedasticity robust standard errors between parentheses. Variables altruism and laziness are centred around their sample median. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 levels, respectively.

Table 6: Results of the Linear Probability Model including the interaction of altruism and laziness with total work experience

Dependent variable: sector of employment		
	(1)	(2)
Altruism	0.027** (0.012)	0.038*** (0.014)
Laziness	0.002 (0.005)	0.006 (0.006)
Work experience	0.001 (0.002)	0.009 (0.006)
Altruism \times work experience	-0.000 (0.001)	-0.002 (0.002)
Laziness \times work experience	0.001** (0.000)	-0.000 (0.001)
Work experience ² /100		-0.023 (0.016)
Altruism \times work experience ² /100		0.006 (0.005)
Laziness \times work experience ² /100		0.002 (0.002)
Intercept	Yes	Yes
Control variables	Yes	Yes
State dummies	Yes	Yes
Observations Dep=0	7786	7786
Observations Dep=1	2781	2781
Total Observations	10567	10567
R ²	0.095	0.095
Log Likelihood	-5799	-5798

Notes: Heteroskedasticity robust standard errors between parentheses. Control variables included in estimation are risk aversion, gender, age, age squared, education, nationality, marital status, and number of children. The variable work experience is measured in years. *, **, and *** indicate significance based on a two sided test at the .10, .05, and .01 levels, respectively.

Figures

Figure 1: Predicted probabilities of working in the public sector (if $\bar{\gamma} > p$)

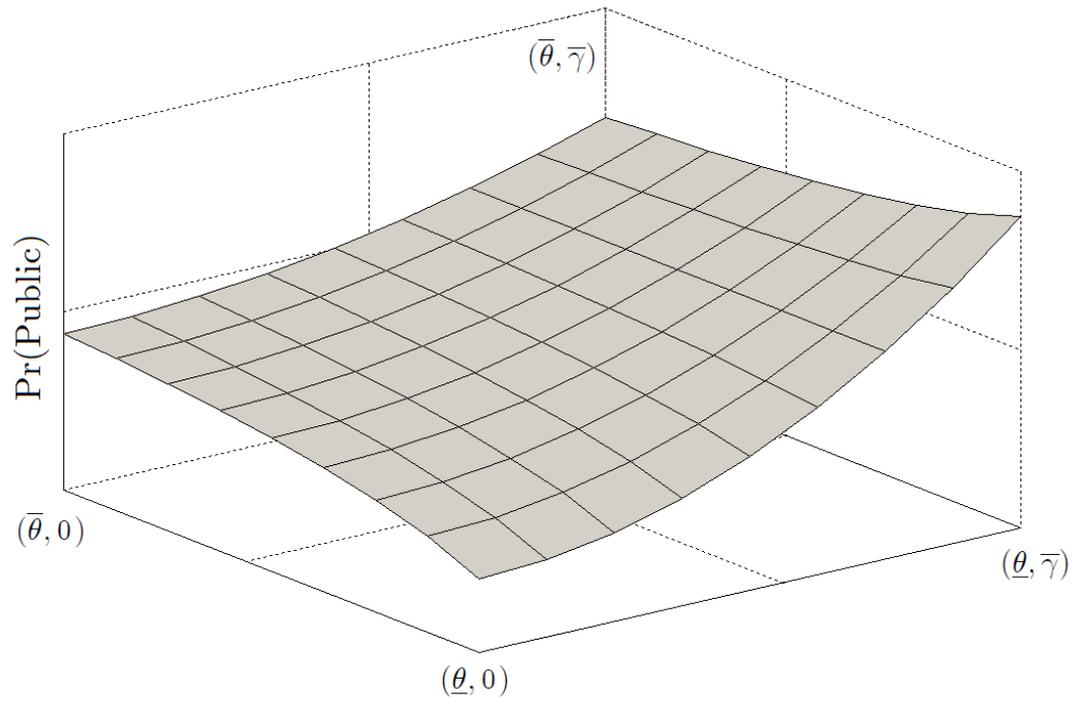


Figure 2: Predicted probabilities of working in the public sector (if $\bar{\gamma} < p$)

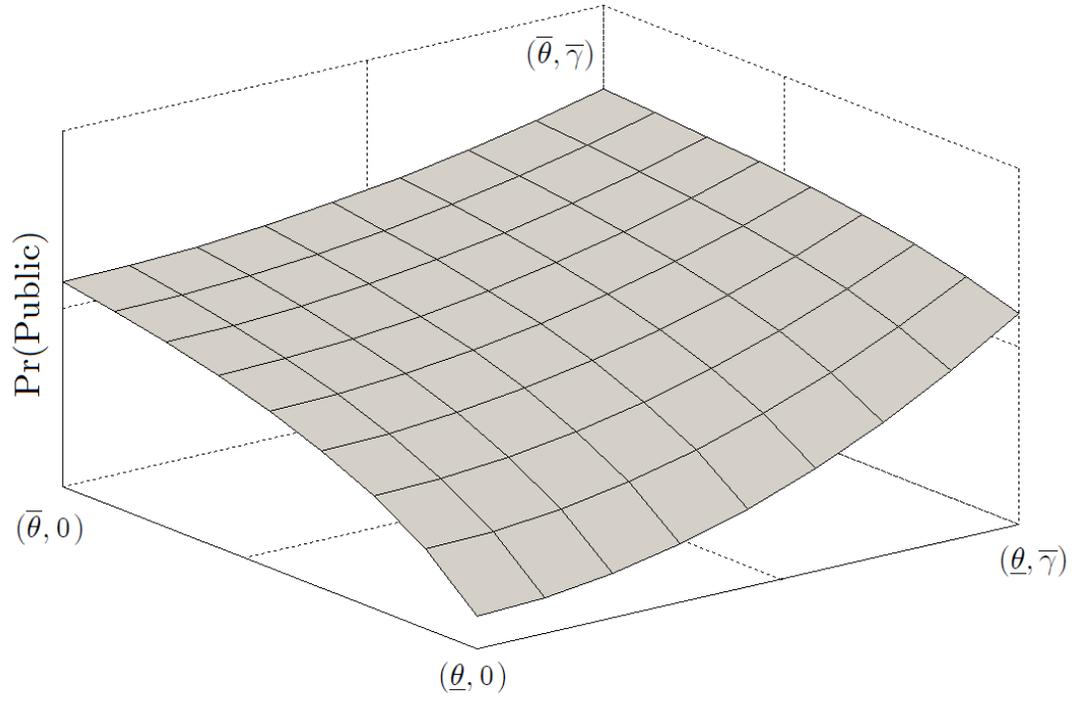
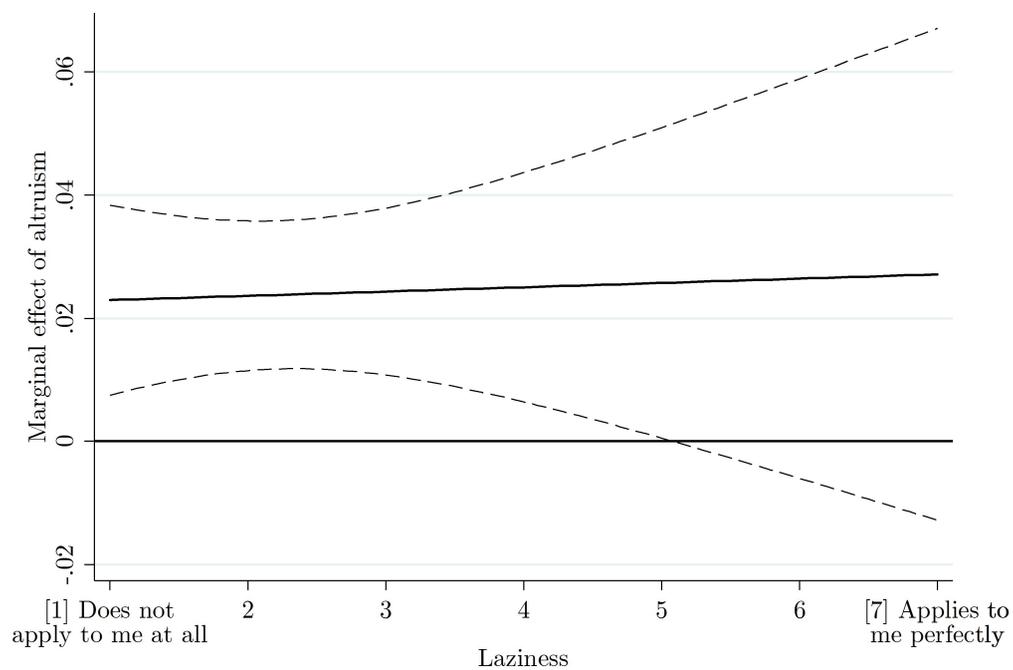
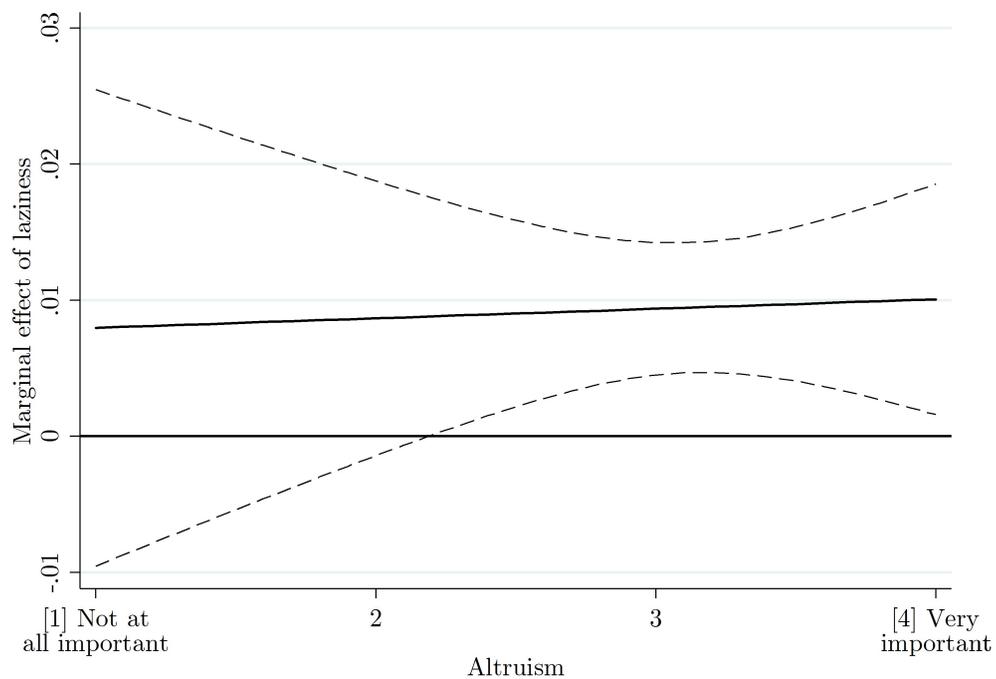


Figure 3: Marginal effect of altruism given a worker's laziness



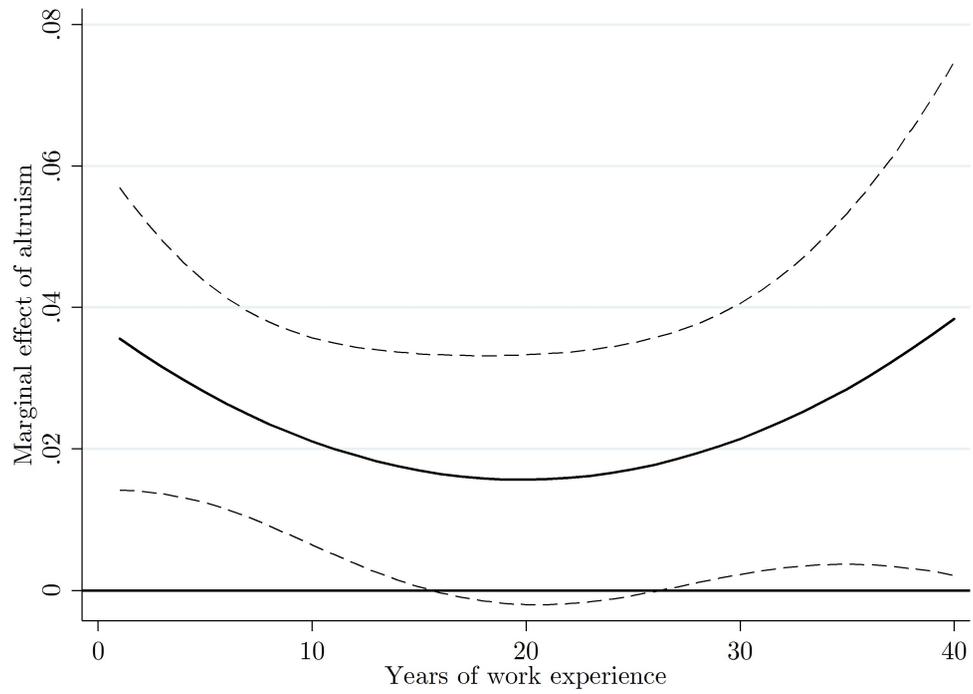
Notes: Solid black line shows the estimated effect of a unit increase in altruism on the likelihood of working in the public sector given a worker's reported laziness. Dashed lines show the 90% confidence interval.

Figure 4: Marginal effect of laziness given a worker's altruism



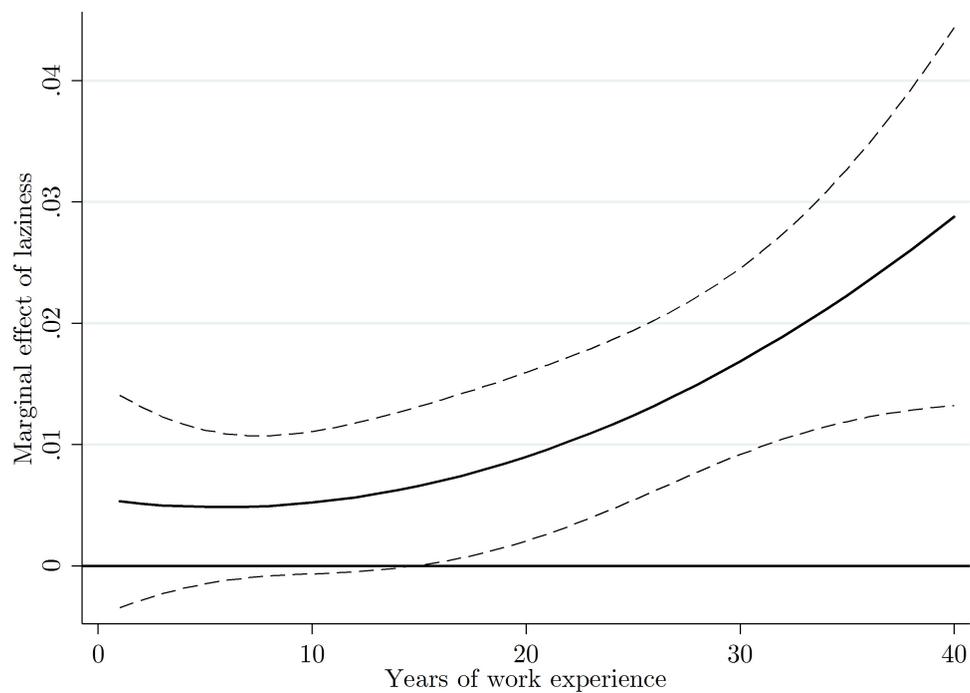
Notes: Solid black line shows the estimated effect of a unit increase in laziness on the likelihood of working in the public sector given a worker's reported altruism. Dashed lines show the 90% confidence interval.

Figure 5: Marginal effect of altruism given the years of work experience



Notes: Solid black line shows the estimated effect of a unit increase in altruism on the likelihood of working in the public sector for a given number of years of work experience. Dashed lines show the 90% confidence interval.

Figure 6: Marginal effect of laziness given the years of work experience



Notes: Solid black line shows the estimated effect of a unit increase in laziness on the likelihood of working in the public sector for a given number of years of work experience. Dashed lines show the 90% confidence interval.