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Tax Fairness Perceptions and Work Morale – A Fairness Spillover

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A FAIRNESS SPILLOVER

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Abstract

It is firmly established that taxes can deter economic effort by reducing monetary incentives. We show that, in addition to these standard effects, beliefs about the *fairness* of taxation may reduce economic effort, too. Specifically, our results suggest a link between the belief that the rich don't contribute adequately to the tax base and low work morale. In our estimations, this belief is associated with 20% higher levels of paid absenteeism due to illness, implying that a tax system which is perceived to violate fairness norms may incur large economic costs so far neglected. We argue that the observed pattern of behavior can be interpreted as an example of conditional compliance with social norms.

Keywords: Tax Fairness, Taxation, Conditional Compliance, Reciprocity, Social Comparisons

JEL: A13, D63, H31, J22.

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1 Introduction

People care about justice in taxation. Especially when it comes to the question of how much to tax the rich. Consequently, this is one of the most widely discussed topics in present-day politics and virtually every political actor has something to say about tax-reform proposals for the upper income brackets. Fueled by the current financial crisis, a *soak the rich* attitude is prevalent in many countries and tax increases for high incomes are being discussed around the globe. Tax breaks for the rich on the other hand usually don't go down well with the public and are often accompanied by political protests. When people are asked in opinion polls, questions about tax cuts for this part of the population often let emotions run high. In a recent *Economist* poll on US public opinion, people were asked how angry they get when they think about "Tax Breaks for the Rich". Almost half of the respondents answered "Very Angry", about one fifth get "Somewhat Angry" while only one out of ten said they "Don't think about it".¹ While the belief that the rich pay too little in taxes obviously affects emotions, it is open to question whether such complaints translate into *behavior*. This is what we empirically investigate in this paper.

The idea that people show behavioral responses to social environments perceived to be unfair is widely held in the literature.² Individuals condition their own contribution to common goals on whether others contribute, i.e. whether others show co-operative or pro-social behavior.³ Consequently, a lower willingness to comply with generally accepted ethical codes results from the fact or belief that others violate social norms. A small strand of research has applied these ideas to fairness in taxation, and asked whether a tax system which is perceived to be unfair evokes compensatory actions in the form of tax evasion.⁴ Carried over to our framework, feelings of unfairness may stem from the belief that the rich do not contribute adequately to the tax pool – e.g. by taking advantage of loopholes or by flat out evading taxes in an illegal manner. However, the blame need not be on the rich themselves: agents may just as well feel that politicians fail to implement tax policies that sufficiently strain the rich and thus deem the tax system unfair. As a result of both mechanisms, the agents may decide not to comply with the norm to pay their tax dues and attempt to restore equity by evading taxes. While at first glance tax evasion is a plausible reaction to perceived injustice in taxation, it is not a viable option for most. Taxable income is often directly reported to the government by employers or other third-party institutions such as banks, investment funds, and pensions funds. This precludes the manipulation of tax returns (Kleven et al. 2010). However, this lack of direct adjustment measures may create spillovers to other spheres of life: instead of

¹Economist/YouGov Poll, conducted March 22-24, 2009.

²For a survey of the fairness literature in economics, see Fehr and Schmidt (2005).

³Frey and Meier (2004); Traxler and Winter (2009).

⁴Andreoni et al. 1998, Feld and Frey 2002, McCaffery and Slemrod 2004 consider the role of tax fairness and other cultural aspects for tax compliance.

evading taxes, agents may resort to non-compliant behavior in surrogate areas. We argue that the realm of the workplace is especially prone to such spillovers. The reason is that exertion of effort at work is not fully contractible and therefore entails various elements of “quasi-voluntary” contributions. Individuals who feel that the rich don’t pay their fair share in taxes may suspect the rich of violating a norm by failing to contribute to the common good. In response, individuals may then cut back their work effort. Refusing to comply with the norm of working hard then serves as a means of reciprocating the norm violation – by not contributing to the common good, either.

That fairness spillovers may indeed exist can be inferred from situations where agents utter that they refuse to make any effort above and beyond the call of duty at work as long as those in charge do not contribute their fair share. This is obviously only anecdotal evidence for the existence of the hypothesized spillovers and a rigorous way of testing for their existence is more difficult to come up with, because such individual ‘work-to-rule’ strategies are notoriously hard to observe and measure. We suggest to use the sickness leave of German employees as a measure of work morale that is easy to observe, and that at the same time allows us to put a price tag on the fairness spillovers and assess their economic relevance. In Germany, there is no reduction of earnings associated with sickness spells of up to six weeks’ duration and, for the first three days of each period of leave, employees are usually not even obliged to provide a doctor’s note. In addition, there are high levels of job protection. We assume that this legal generosity provides incentives to utilize it as a means of shirking one’s duty when others are suspected of not contributing to common goals.⁵ The data on sick leave stems from the German Socio-Economic Panel (GSOEP), which in its 2005 wave also includes questions about how people evaluate the fairness of the tax system at the upper end of the income distribution. We take the belief that managers don’t pay enough taxes to represent perceived unfairness in favor of the rich and use this variable to explain the number of days absent from work, carefully conditioning on health status, a rich set of income, personal and job related variables. We find that the belief that managers pay too little in taxes is strongly positively correlated with our indicator of non-compliant behavior, even after netting out the factors mentioned above. On average, employees with the perception that managers pay too little in taxes accrue 20 percent more sick days, which translates to 1.5 more days absent from work per year.

With the extremely diverse set of control variables that the GSOEP provides, a control variable strategy goes a long way in correcting potential biases. Just to give some examples, we can include a respondent’s degree of being leftist and his/her belief about whether luck determines success in life. This addresses the problem that people with high

⁵This is not to say that everyone on sick leave is a shirker. However, that absence due to illness is not purely a response to medical conditions is widely accepted in the labor economics literature (Barnby et al. 2002; Johannsen and Palme 2005; Puhani and Sonderhof 2010).

levels of sick absence may become aware that they are net beneficiaries of the social security system, and hence, want high levels of redistribution. Our data also allows us to control for the respondents' general pessimism and dissatisfaction with life to address the concern that a general negativism or a complainer attitude may trigger both, beliefs of injustice in taxation and a lower work morale. In addition, we can control for a wide range of other potential confounders such as perceived job security, job satisfaction, laziness and degree of risk aversion. When included into the regression, none of these additional 'soft variables' changes our estimated effect of fairness beliefs on absenteeism appreciably. This makes it unlikely that unobserved characteristics bias our results. In fact, we augment the control variable strategy by implementing a research design which consists of conducting Rosenbaum-type sensitivity tests, revealing that any remaining omitted variable would need to have implausibly strong associations with absenteeism and fairness beliefs in order to spuriously generate our results. Given the large set of observed covariates, we find the existence of such an important unobserved variable extremely unlikely. This convinces us that our finding of a positive effect of fairness beliefs on absenteeism is not merely a spurious correlation.

Our study is the first that empirically relates tax fairness perceptions to work effort, to the best of our knowledge. It is closely related to literature in workplace psychology – which largely builds on Adams' equity theory (1963, 1965) – as well as work effort experiments in economics (Fehr and Falk 2002; Fehr and Schmidt 2005). Both these strands of literature analyze whether perceptions of fairness *within* the workplace matter for work performance and link fairness to reciprocity, or conditional compliance. They argue that when others take actions that violate certain work related norms – in the case of equity theory the norm that the ratio of work input to work output should be equalized, in the context of experimental economics the norm to give “kind” wage offers – individuals adjust their own work effort in order to reciprocate. Departing from direct reciprocity, we suggest work performance to be sensitive to compliant behavior of agents outside the realm of workplace. Hence, we raise the issue of indirect reciprocity or indirect compliance: Individuals exhibit substantial adjustment behavior even in ways and areas that at first seem far removed from the domain where the perceived injustice occurred.⁶ This is what we label 'fairness spillovers'.

This paper also contributes to the question of how taxation affects the economy. The conventional wisdom is that taxation changes monetary incentives, e.g. by reducing the opportunity costs of leisure, or the expected value of consumption. We suggest a complementary channel: People seem to have beliefs about fairness in taxation – and it is these beliefs that provide an incentive on their own. Considering that the effects of perceived

⁶Another example for behavior where individuals use seemingly unrelated outlets in response to external emotional cues is given by Card and Dahl (2009).

unfairness on absenteeism are large, the costs of taxation could be quite different from what is usually assumed. Put differently, a “hidden” excess burden of taxation may result from the association between tax fairness and work morale.

The remainder of the paper is organized as follows. Section 2 provides a more detailed exposition of how fairness perceptions may affect work morale. Section 3 describes the data and gives some descriptive statistics. Section 4 presents and discusses the baseline empirical results. Section 5 presents robustness checks, and section 6 concludes.

2 Background

How do individuals react when their sense of tax fairness is violated? Fortunately, most people will not go to such extremes as the person who decided to crash his airplane into an Austin tax office in early 2010, killing himself and an employee. The suicide note was described by the New York Times as a ‘rant against the government, big business and particularly the tax system [...]’.⁷ Such drastic violent acts are rare, but each year the US tax authorities are faced with a substantial number of threats against employees.⁸ The problem is so serious that there even is an Internal Revenue Service (IRS) database of ‘Potentially Dangerous Taxpayers’, and every year a number of individuals receive jail sentences as a consequence of making such threats.⁹ There is no denying that taxation is an emotionally charged issue for most, and so these violent outbursts may only be the tip of the iceberg, indicative of a more widespread disgruntlement with the tax system. Indeed, opinion polls regularly show that a large share of individuals is discontent with the current state of taxation, especially when it comes to the taxation of wealthy individuals. In April 2009, between 51% and 74% of respondents were in favor of increasing tax rates for those earning more than \$250,000.¹⁰ When explicitly asked about the fairness of the tax system, in a 2007 Gallup poll 66% of respondents said they felt that ‘upper-income people’ paid less than their fair share in taxes. An even higher share of people (71%) believed that corporations didn’t contribute adequately.¹¹ Interestingly, even the

⁷See <http://www.nytimes.com/2010/02/19/us/19crash.html>.

⁸The Treasury Inspector General for Tax Administration (TIGTA) has investigated more than 1,000 threats against IRS employees in 2009. See the article in the Wall Street Journal at <http://online.wsj.com/article/SB10001424052748704757904575077381781219798.html>, and the TIGTA website at <http://www.treas.gov/tigta>.

⁹Guidelines for identifying Potentially Dangerous taxpayers are laid out in Part 25.4.1 of the Internal Revenue Service’s (IRS) Internal Revenue Manual (IRM), accessible at <http://www.irs.gov/irm>.

¹⁰See the Rasmussen report http://www.rasmussenreports.com/public_content/business/taxes/february_2009/51_say_tax_hike_on_those_earning_over_250_000_is_a_good_move, a CBS/NY Times poll at http://www.cbsnews.com/htdocs/pdf/poll_Obama_040609.pdf, and a Fox News poll at http://www.foxnews.com/projects/pdf/030509_Poll.pdf.

¹¹See <http://www.gallup.com/poll/27199/americans-say-federal-income-taxes-too-high-unfair.aspx>. As an interesting aside, 60% of individuals felt that their own tax burden was fair.

billionaire Warren Buffett publicly points out that his own average tax rate is much lower than that of his receptionist, a first indicator that believing the tax system to be unfair at the top is not confined to working class individuals.¹²

Clearly, the feeling of being exposed to an unfair tax system is not uncommon, and some people find extreme ways of expressing their grievance. However, there is obviously an enormous number of individuals who are discontent, but do not turn to violent actions in response. Do these individuals simply accept the situation, or will they turn to less visible adjustment behavior? So far, a number of studies has suggested looking at tax evasion as a possible outcome of an unfair tax system. This literature emphasizes that tax avoidance behavior is shaped by three aspects of tax fairness. First, the fiscal exchange paradigm stresses that agents evaluate the fairness of taxation from the ratio of tax contributions to received public goods or services (see e.g. Spicer and Becker 1981, Kinsey et al. 1991) – an idea that corresponds to the benefit principle of taxation. Individuals who perceive their contributions as being too high in relation to the returns will then attempt to evade taxation as a rectifying measure. When it comes to taxation of the rich, one would expect higher levels of tax evasion for those who believe that the wealthy and corporations don't pay enough taxes (e.g. due to greater opportunities for tax avoidance). Second, general fairness may play a role. This argument goes beyond regarding tax payments as pure contributions toward the selfish acquisition of public goods or services. Here, the payments are considered to serve the purpose of furthering a *bonum commune* or a common goal (Feld and Frey 2007). In return, taxpayers expect the government to provide a tax system that incorporates general fairness criteria such as distributive or procedural justice. A government that does not conform to these expectations, e.g. by enacting a tax schedule that is deemed to impose too small a burden upon the wealthy, may reap higher levels of evasive actions. The third fairness aspect does not focus on the taxpayer-government relationship, but rather stresses taxpayer-taxpayer relationships: Tax fairness is assessed by the extent to which others pay the dues they are legally obliged to, i.e. the extent of others' tax evasion (Alm et al. 1999). From this view, agents start to evade taxes if they feel that evasion is common practice among other members of the society – in our case the belief that the wealthy evade taxes may increase evasive efforts by others. In all three aspects of tax fairness brought forward in the existing literature it is some kind of conditional compliance mechanism that drives tax evasion behavior. In the fiscal exchange case, compliance is conditioned upon some ratio being met. In the case of general or distributional fairness, compliance is higher when government ensures that certain standards are implemented. Others' compliance with the social norm to obey tax laws is the prerequisite for tax compliance in the third case.

Apparently, tax fairness norms may be violated by non-compliant behavior of other agents,

¹²See www.nytimes.com/2007/07/15/business/yourmoney/15view.html.

be it individuals or the entity of government. Regardless of who is blamed, whenever individuals feel that others do not comply and tax fairness has thus been violated, conditional non-compliance in the form of tax evasion could be a straightforward reaction, and experimental evidence makes a strong case in favor of the idea. However, in real-life situations the opportunities for cheating are slim for most agents. This is due to the fact that advanced economies make extensive use of third-party information reporting whereby institutions such as employers, banks, investment funds and pension funds report taxable income directly to the government and taxes are often levied in the form of withholding taxes (Kleven et al. 2010). Accordingly, underreporting of income is much higher for income categories with little third-party reporting, such as business income, than for income categories with substantial third-party reporting, e.g. wages and salaries (Slemrod 2007). Rather than bottling up the frustrations, agents with limited possibilities of tax evasion may scramble to find alternative measures of adjusting to perceived unfairness. 'Fairness spillovers' of taxation may thus arise outside the realm of taxation. Social psychologists have long stressed that the workplace constitutes a sphere of life where fairness considerations play an important role – to quote Elster (1989), the 'workplace is a hotbed of norm-guided actions'. This idea has recently been rediscovered by economists and various experiments on the role of fairness at the workplace have been conducted. The common interest in these studies is in testing whether perceptions of fairness *within* the workplace matter for work effort. However, in his original equity theory, Adams (1963) argued that equity considerations are not restricted to narrowly defined social relations such as those *within* the workplace. He stressed that they can be considered at much higher levels, noting that equity theory is "relevant to any social situation in which an exchange takes place, whether the exchange be of the type taking place between man and wife, between football teammates, between teacher and student, or even, between Man and his God" (Adams 1963, p. 422). Social psychologists have also provided evidence that individuals faced with a good or a hostile action do not necessarily reciprocate to the same person from which they received the action, but that they may reciprocate towards other people (Brown 1986). Such broader approaches to behavioral consequences of equity violations suggest that work morale may also be influenced by factors *outside* the workplace. Building on this notion, we suggest broadening the scope on what may influence work effort to include perceived fairness of taxation. Put differently, we believe that the consequences of unfair taxation can spill over to another area. Just as paying taxes, hard work is seen as a virtue and a contribution to the common good across all cultures, religions and political regimes (Lipset 1992). Conditional compliance may then materialize in the exertion of work effort just as well as it may in paying taxes. In the same vein, a 'fairness spillover' of discontent with the tax system can lead individuals to reduce their contribution to the common good by lowering work effort. In particular, those who feel that the rich do not contribute to the common good by paying ample taxes

may in return resort to shirking as a means of non-compliance.

3 Data and descriptive statistics

Testing whether the belief that the rich pay too little in taxes is associated with lower levels of work morale is challenging, as real-world data on beliefs towards justice in taxation and on work morale are usually not readily available. An exception is the 2005 wave of the German Socio-Economic Panel (GSOEP), a large nationally representative household panel data set.¹³ This survey includes questions on tax fairness perceptions and on absenteeism from the workplace, which we use as a proxy for work morale.

The 2005 questionnaire of the GSOEP asked respondents how they perceive the tax burden of individuals at the upper end of the income distribution, exemplified by "managers". The introduction to the question reads: "In Germany, everyone has to pay taxes in relation to his or her income. Those who earn more have to pay higher taxes (also known as 'progressive taxes')". Respondents are then asked: "[...] what do you think about the taxes paid by a manager on the board of directors of a large company? Does he/she pay too much, too little, or an exactly appropriate amount in taxes compared to other groups?". There are four categories among which respondents could choose: 'too much', 'too little', 'appropriate', 'don't know'.

The framing of the question alludes to the principle of progressive taxation, which postulates that the individuals' average tax rate should increase as income increases. Yet the question does not explicitly ask 'is there enough progression in the German tax system?', and so there is scope for individuals to apply fairness principles other than that of sufficient progression. For example, respondents may think of the typical manager as someone – as Mankiw (2007) puts it – from the 'leisure class' who 'collects interest and dividend checks and spends long afternoons relaxing on his yacht'. In combination with a belief that capital income is subject to lower tax rates than income from 'hard labor', this should make respondents inclined to state that managers don't pay enough taxes. Such an answer could purely be the result of a tax fairness norm that postulates horizontal equity in the sense of a synthetic taxation of income. Horizontal equity concerns also come into play when the belief is present that the rich have more loopholes at their disposal that allow them to reduce their tax burden. This could violate a principle that every taxpayer should have equal rights. In both these cases, the respondent believes that the government fails to implement an appropriate legal framework. However, respondents may also interpret the question in a completely different way. They may – as stated above – feel that the rich evade taxes illegally or they may evaluate fairness from a fiscal exchange

¹³See Wagner et al. 2007 for a description of the panel survey.

view. In the end, for our purposes it does not matter which tax fairness principle respondents actually have in mind. What matters is that individuals apply *some* tax fairness principle.

In table 1 we present the distribution of the belief that managers are taxed too little. We exclude those who answered 'don't know' and coded the variable to zero when managers' taxation was deemed 'too high' or 'appropriate'. Hence, the reference group is composed of people who do not think that managers are taxed too little.¹⁴ The first column of the table shows that an overwhelming 72% of respondents think that managers are taxed too little. One might suspect that this view is more strongly held by individuals at the lower end of the income distribution. In the remaining columns of the table we therefore break this figure up by income quartiles, by worker class (blue collar / white collar) and by three different skill-related hierarchy levels within an individual's broad occupation. It is striking how strongly the belief that managers are taxed too little is also held by individuals from the higher income and occupation groups. It is held by 61% of the respondents in the 4th income quartile (compared to 78.5% of individuals in the first income quartile) and by 68% of white-collar workers (compared to 81.4% of blue-collar workers). We conclude from these numbers that the belief that managers do not pay their fair share in taxes is indeed not confined to individuals from low-income groups. Quite the contrary, this view is held by a wide range of individuals from different social backgrounds.

If individuals react to perceived unfairness by reducing work morale, they are most likely to chose a margin of adjustment where they don't negative consequences. An easily adjustable margin, especially in the German institutional setup, is the number of days absent from work due to illness. The German social security system is very generous towards taking days off from work due to sickness. There is no reduction of payments for sickness spells of up to six weeks and, for the first three days of each spell, employees are usually not even obliged to produce a doctor's note. Taking a day off sick therefore comes virtually without cost to the individual. Adjusting hours worked, on the other hand, is much more difficult and much more likely to come with repercussions. Working fewer hours in general reduces earnings. Also, for most professions the hours worked are non-negotiable, i.e. the job contract states weekly hours and those are largely fixed.¹⁵ When it comes to overtime, many contracts state that such extra hours are mandatory whenever circumstances make them necessary. What is more, it may be easier to stay at home for a day sick than telling your boss face to face you're not up for overtime work, because refusing to work overtime will signal low work morale and potentially rob oneself

¹⁴Perhaps not surprisingly, the view that managers pay too much taxes is only held by 6% of the respondents.

¹⁵Incidentally, this also makes estimating wage elasticities of labor supply extremely challenging, see Farber (2005) and Oettinger (1999).

TABLE 1: ARE MANAGERS BEING TAXED TOO LITTLE?

	full sample	income quartiles				hierarchy in occupation			worker class	
		Q1	Q2	Q3	Q4	low	med	high	blue	white
Yes (%)	72.1	78.5	76.8	75.3	61.1	80.3	75.5	60.1	81.4	68.0
<i>N</i>	3647	680	968	1091	908	602	2228	817	1191	2057
No (%)	27.9	21.5	23.2	24.7	38.9	19.7	24.5	39.9	18.6	32.0
<i>N</i>	1413	186	292	357	578	148	723	542	273	970
Total	5060	866	1260	1448	1486	750	2951	1359	1464	3027

Note: Data is taken from the 2005 wave of the German Socio-Economic Panel. Sample restricted to those observations used in the full specifications in table 3. The question reads: “In Germany, everyone has to pay taxes in relation to his or her income. Those who earn more have to pay higher taxes (also known as ‘progressive taxes’).[...]And what do you think about the taxes paid by a manager on the board of directors of a large company? Does he/she pay too much, too little, or an exactly appropriate amount in taxes compared to other groups?” There are four categories among which respondents could choose: ‘too much’, ‘too little’, ‘appropriate’, ‘don’t know’. The indicator variable used in this paper drops all individuals that answered ‘don’t know’. In addition, all individuals that answered either ‘too much’ or ‘appropriate’ are coded as zero, i.e. they do not think that managers are being taxed too little. The total number of observations is lower in the final two columns, as some individuals cannot be classified as blue or white collar individuals.

of future career opportunities. Taking a sick day is different: people are more reluctant to call someone who is absent due to (alleged) sickness a shirker. After all, everyone gets sick at some point and so a sick day will, besides not costing money, be much less likely to be taken for low work morale. Moreover, the employee is under full control of whether or not he takes a day off due to sickness – a big difference to mostly exogenously determined work or overtime hours. For these reasons, the analysis will be based on absenteeism due to sickness as the dependent variable.

TABLE 2: DAYS ABSENT BY ANSWER TO ‘ARE MANAGERS TAXED TOO LITTLE?’.

	managers taxed too little		difference in days absent
	yes	no	
managers taxed too little (%)	72.1	27.9	
Days absent by answer category	8.34 (.31)	5.58 (.32)	2.76*** (.54)
<i>N</i>	3647	1413	

Note: Percentage of respondents who think that managers are being taxed too little. Mean days absent by opinion on manager taxation and t-test of difference in means of absenteeism (standard errors in parentheses). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The GSOEP provides the self-reported annual number of days absent from work due to illness. This question reads “How many days were you not able to work [last year] because of illness?” Because of the retrospective nature of the question we draw the information on work absence from the 2006 GSOEP wave so that we can relate it to the fairness perceptions collected in the 2005 wave. We exclude self-employed individuals because our argument for using absenteeism as a work effort variable does not apply to them. Figure 1 in the appendix shows the distribution of the days absent from work. It shows that about 45% of the individuals had no absent days in 2005 (the mean is 7.57, the standard deviation 17.3 and the median 2 days). The second row of table 2 shows that those who think that managers are taxed too little are absent from work 8.34 days, while those who think that managers are appropriately or excessively taxed are absent for only 5.58 days. This “fairness gap” of 2.76 days is highly statistically significant, and in relative terms amounts to 36% of the average number of days absent. These observations are consistent with the idea that individuals not only ‘get angry’ when thinking about tax breaks for the

rich – as implied by the Economist poll mentioned above – but that there are behavioral consequences to unjust taxation of the rich.

4 Estimation results

The descriptive statistics presented in section 3 show a positive correlation between the belief that managers pay too little in taxes and days absent from work – a first indicator that there may indeed be spillovers from tax fairness perceptions to work morale. The GSOEP provides a vast array of control variables, far beyond what is usually available in survey data, and this section provides estimates of the association between fairness perceptions and absenteeism after netting out these possibly confounding factors. Table 8 in the appendix provides descriptions of all variables used in the analysis, and table 9 in the appendix provides the corresponding summary statistics. Our benchmark estimation is the linear OLS case, but due to the nature of the dependent variable, we also use count-data and Quasi-Maximum-Likelihood methods. These estimates give an idea of the magnitude of the 'fairness gap', the difference in sick days between two individuals who only differ in their assessment of whether or not the rich pay their fair share in taxes. Section 4.2 then goes on to investigate whether this fairness gap varies across population subgroups.

4.1 Baseline results

The main explanatory variable in all regressions of this subsection is the indicator variable for whether an individual believes that 'managers are being taxed too little', which we take as a measure of whether taxation at the top of the income distribution is in line with a respondent's concept of fairness. We expect people holding this belief to respond by increasing their days absent from work and thus the dependent variable is the number of sick days in the year of the survey.¹⁶

¹⁶We exclude individuals who report more than 250 sick days, the maximum number of workdays per year. We could also have used a binary indicator of whether a person had at least one day of sick absence, however, finding an explanatory model for whether an individual has zero versus a positive number of sick days is not actually what we are looking for. We believe the mechanism that we describe to work at any given number of sick days. That is, we are not interested in the effect of fairness perceptions on the probability of not being sick for even one day, but rather we are interested in the effect on the total number of sick days. It is probably easier for respondents to just 'add' another day to sick days they already have. This practice may come with less feelings of guilt than taking the first day off without actually being sick. This leads us to expect a rather small effect in the dummy dependent variable case. Probit estimations not reported here confirm this. Believing that manager taxation is unfair has a marginal effect of 0.041 in the full specification, i.e. the perception of an unfair tax system is associated with a four percent higher probability of having at least one sick day.

Table 3 provides the results from linear OLS estimations. Column (1) reproduces the raw differential presented in table 2 by using a bivariate regression model: People who think that managers are taxed too little report on average 2.9 more days of staying away from work due to illness.¹⁷ A first natural candidate to control for is a person’s individual health.¹⁸ It might be argued that the correlation of Column (1) is driven by reversed causality: Those who stay at home due to illness may become aware that they are net beneficiaries of the social security system and therefore always think that taxation levels are too low. Column (2) therefore adds two indicators of respondents’ health status. Health score is a self-reported assessment of an individual’s objective health status. Respondents can rate their health on a scale ranging from ‘poor’ [1] to ‘very good’ [5]. However, there may be vast differences in the health threshold that needs to be reached before a person decides to call in sick. Hence, we also control for the subjective satisfaction with health status. This variable is coded on an 11-point scale ranging from ‘totally unhappy’ [0] to ‘totally happy’ [10]. Both variables are significant and the coefficients bear the expected negative sign. They imply that better objective health leads to lower levels of absenteeism, and that at fixed objective health, higher levels of satisfaction with this particular level of well-being are associated with lower absenteeism.¹⁹ Most interestingly, the difference in absenteeism after controlling for health is still two full days, compared to the 2.9 days difference in absenteeism without any controls.

Individual income is also an important control variable. One can argue that low-income earners may systematically want higher tax levels for the rich, and that they also have a higher probability of shirking, as they have less at stake when getting caught. Since this would bias our coefficient of interest upwards, income is included in column (3) along with other personal characteristics, some of which would be included in a standard Mincer equation. It turns out that a higher level of education is associated with fewer sick days, as is advanced age and having children. However, the belief that the tax system at the upper end of the income distribution is unfair is still associated with significantly higher levels of absenteeism, despite the gap being cut down to one sick day. Adding job and firm related variables in columns (4) and (5) does not further diminish the tax fairness coefficient, the difference in absenteeism now actually increases somewhat. Longer job tenure and larger firm size are both associated with higher levels of absenteeism. A possible explanation would be that longer tenure makes it harder for employers to punish shirking due to lay-off protection laws, while a larger firm size reduces the probability of getting caught while

¹⁷The numbers diverge somewhat, because the descriptives in table 2 are based on the smaller sample which is used in the full specification (6).

¹⁸In fact, if everyone used sick days the way one is supposed to, there should not be any systematic predictors of absenteeism other than actual health.

¹⁹Obviously, both these variables are of a subjective nature, even if the health score variable asks for an objective level of well-being. We would of course prefer to have a really objective measure, such as the results from getting a physical at a doctor’s office. Unfortunately, such data are not available in the GSOEP.

shirking. From column (4) on, the specifications also include 16 indicators for the German regions and 9 indicators representing an individual’s rank in occupational hierarchy – the former for netting out regional differences in work attitudes among others, the latter as further controls for socio-economic status.

The GSOEP allows us to account for some personal attitudes and mental states directly, rather than using proxies for them. After adding these variables in column (6) the absenteeism difference increases somewhat to 1.5 days and remains highly significant. We control for whether someone is satisfied with his job, since the job related and firm related variables we included above may not fully capture workplace characteristics driving both work morale and attitudes towards taxing the rich. Lower job satisfaction can reduce an individual’s work morale and may be the result of antipathy against own superiors, who individuals may equate with the “rich” or the “managers”. We also include fear of job loss, although perceived job security may already be partly covered by the dummies for part-time and marginally employed. Finally, we take into account self-reported laziness as well as a person’s degree of risk aversion, as shirking is still a risky behavior even under the high job protection levels in Germany. Remarkably, none of these additional “soft”, or subjective, variables show a significant association with absenteeism, and the fairness gap remains the same.

The gap associated with differing perceptions of tax fairness is apparently very robust to the specification chosen and hardly changes at all after the inclusion of health and personal characteristics. The main message of these estimates is that the connection between tax fairness beliefs and absenteeism, described in section 3, does not seem to be an artefact of failing to control for these observable characteristics.

The fact that the dependent variable can only take on non-negative integer values means that OLS is not the preferred method of estimation and count-data methods are a better fit. This is why table 4 presents results from a Poisson model, a Negative Binomial (Negbin II) model, and a two-step Negative Binomial Quasi Maximum Likelihood Estimator (QMLE). While the first two of these models are fairly standard count-data models, the third was proposed by Wooldridge (2002) and has desirable robustness properties. The QMLE estimator is a fully robust estimator in the sense that it does not rely on the distributional assumption and the variance assumption of the Negbin II model. Only the conditional mean assumption is needed for consistency.²⁰ In the Poisson model shown in column (1) all control variables have significant coefficients. However, due to overdispersion in the dependent variable – which can be inferred from the estimate of η^2 in the two other models – the standard errors produced by the Poisson model systematically underestimate the true standard errors. Inference should therefore be based on the Neg-

²⁰See Wooldridge (2002) for details.

TABLE 3: OLS, DEPENDENT VARIABLE DAYS ABSENT.

	(1)	(2)	(3)	(4)	(5)	(6)
managers taxed too little	2.915*** (0.394)	2.013*** (0.372)	1.171*** (0.409)	1.277*** (0.436)	1.357*** (0.453)	1.541*** (0.447)
health score		-3.392*** (0.413)	-3.382*** (0.453)	-3.283*** (0.470)	-3.473*** (0.490)	-3.317*** (0.486)
health satisfaction		-.8846*** (0.186)	-.9287*** (0.201)	-.9905*** (0.208)	-.9619*** (0.215)	-1.051*** (0.238)
Personal characteristics						
gross income		.0439 (0.109)	.0439 (0.109)	-.0871 (0.124)	-.2121 (0.132)	-.1621 (0.130)
age		-.3146** (0.140)	-.3146** (0.140)	-.3523 (0.228)	-.4602* (0.250)	-.2535 (0.238)
agesq		.0037* (0.002)	.0037* (0.002)	.0047 (0.003)	.0062* (0.003)	.0032 (0.003)
male		-.7615 (0.511)	-.7615 (0.511)	-.99 (0.630)	-.119* (0.662)	-.7492 (0.642)
children		-1.165** (0.461)	-1.165** (0.461)	-.6608 (0.508)	-.5138 (0.533)	-.5237 (0.537)
foreign		1.799 (1.269)	1.799 (1.269)	1.983 (1.321)	1.913 (1.392)	.8479 (1.198)
schooling		-.3972*** (0.083)	-.3972*** (0.083)	-.3582*** (0.134)	-.3166** (0.138)	-.3312*** (0.125)
Job related variables						
tenure		.2354*** (0.082)	.2354*** (0.082)	.2354*** (0.082)	.2179*** (0.084)	.1966** (0.084)
tenure sq		-.0067*** (0.002)	-.0067*** (0.002)	-.0067*** (0.002)	-.0068*** (0.002)	-.0062*** (0.002)
full time experience		-.1406 (0.137)	-.1406 (0.137)	-.1406 (0.137)	-.1693 (0.142)	-.1914 (0.135)
full time experience sq		.0029 (0.003)	.0029 (0.003)	.0029 (0.003)	.0032 (0.003)	.0049 (0.003)
part time experience		.0848 (0.161)	.0848 (0.161)	.0848 (0.161)	.054 (0.165)	.0822 (0.139)
part time experience sq		-.0054 (0.004)	-.0054 (0.004)	-.0054 (0.004)	-.0049 (0.004)	-.004 (0.004)
part time ^(a)		-1.694* (1.032)	-1.694* (1.032)	-1.449 (1.032)	-1.449 (1.032)	-1.407 (1.015)
marginally employed		-6.492*** (1.167)	-6.492*** (1.167)	-6.492*** (1.167)	-6.459*** (1.201)	-6.31*** (1.223)
Firm level variables						
20<employees<200 ^(b)		1.546** (0.699)	1.546** (0.699)	1.546** (0.699)	1.546** (0.699)	1.579** (0.714)
200<=employees<2000		3.696*** (0.808)	3.696*** (0.808)	3.696*** (0.808)	3.696*** (0.808)	3.224*** (0.796)
employees>2000		3.079*** (0.708)	3.079*** (0.708)	3.079*** (0.708)	3.079*** (0.708)	2.849*** (0.712)
agriculture ^(c)		-3.385** (1.530)	-3.385** (1.530)	-3.385** (1.530)	-3.385** (1.530)	-3.224** (1.521)
mining/energy		4.606 (2.865)	4.606 (2.865)	4.606 (2.865)	4.606 (2.865)	5.25* (2.967)
processing		-.4616 (0.924)	-.4616 (0.924)	-.4616 (0.924)	-.4616 (0.924)	-.0545 (0.900)
traffic/media		.8531 (1.079)	.8531 (1.079)	.8531 (1.079)	.8531 (1.079)	.7244 (1.033)
construction		1.819 (1.565)	1.819 (1.565)	1.819 (1.565)	1.819 (1.565)	2.045 (1.610)
wholesale		1.368 (1.075)	1.368 (1.075)	1.368 (1.075)	1.368 (1.075)	1.641 (1.087)
services		-.473 (0.762)	-.473 (0.762)	-.473 (0.762)	-.473 (0.762)	-.3028 (0.743)
banking/insurance		-1.163 (0.945)	-1.163 (0.945)	-1.163 (0.945)	-1.163 (0.945)	.3499 (0.946)
public sector		.2814 (0.803)	.2814 (0.803)	.2814 (0.803)	.2814 (0.803)	.6824 (0.752)
Personal attitudes						
afraid to lose job						-.0953 (0.507)
satisfied w/ job						.0476 (0.172)
lazy						-.102 (0.157)
risk taker						.0538 (0.124)
constant	5.425 (0.270)	24.44 (1.519)	37.34 (3.421)	36.99 (4.814)	37.46 (5.301)	33.54 (5.307)
16 region dummies	No	No	No	Yes	Yes	Yes
9 occupation dummies	No	No	No	Yes	Yes	Yes
log-Likelihood	-3.2e+04	-3.2e+04	-2.4e+04	-2.4e+04	-2.2e+04	-2.1e+04
R ²	0.01	0.057	0.071	0.080	0.088	0.088
N	7327	7304	5773	5535	5217	5060

Note: Standard errors in parentheses allow for clustering at the household level. Reference categories are: (a) full-time for 'job status', (b) less than 20 employees for 'firm size', (c) manufacturing for 'sectoral dummies'. Columns (1)-(6) are standard linear OLS regressions with dependent variable 'number of days absent'. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

ative Binomial and QMLE models.²¹ Coefficients must be interpreted as in a log-linear regression, and the preferred QMLE model estimates the difference in absenteeism at 26 log points (corresponding to an effect of 30%), which translates to roughly 2 days of absenteeism – somewhat more than the OLS estimates in column (6) of the previous table suggested. This again emphasizes the very robust nature of the fairness gap and establishes that individuals who perceive the tax system to be unfair have a much higher level of absenteeism, even after conditioning on a vast array of possible confounders.

TABLE 4: COUNT DATA METHODS.

	(Poisson)	(Negative Binomial)	(2-step NegBin QMLE)
managers taxed too little	.2262*** (0.013)	.2575*** (0.064)	.2558*** (0.061)
health score	-.4058*** (0.009)	-.3562*** (0.049)	-.3566*** (0.047)
health satisfaction	-.1116*** (0.004)	-.1067*** (0.022)	-.1067*** (0.022)
<i>Personal characteristics</i>			
gross income	-.0502*** (0.006)	-.0527** (0.025)	-.0524** (0.023)
age	-.0316*** (0.005)	-.0433 (0.031)	-.043 (0.028)
agesq	4.2e-04*** (0.000)	4.4e-04 (0.000)	4.4e-04 (0.000)
male	-.0772*** (0.014)	-.0882 (0.076)	-.089 (0.070)
children	-.0834*** (0.012)	-.0766 (0.065)	-.0769 (0.061)
foreign	.0927*** (0.022)	.0244 (0.125)	.0257 (0.107)
schooling	-.0524*** (0.003)	-.0357** (0.015)	-.0361** (0.015)
<i>Job related variables</i>			
tenure	.0257*** (0.002)	.0191* (0.010)	.0192* (0.010)
tenure sq	-7.8e-04*** (0.000)	-5.9e-04** (0.000)	-6.0e-04** (0.000)
full time experience	-.02*** (0.003)	-.013 (0.015)	-.0132 (0.015)
full time experience sq	4.7e-04*** (0.000)	4.4e-04 (0.000)	4.4e-04 (0.000)
part time experience	.007** (0.003)	-.008 (0.018)	-.0077 (0.017)
part time experience sq	-4.7e-04*** (0.000)	2.6e-04 (0.001)	2.3e-04 (0.001)
part time ^(a)	-.1634*** (0.020)	-.178* (0.103)	-.1785* (0.099)
marginally employed	-1.195*** (0.050)	-.9221*** (0.182)	-.9255*** (0.231)
<i>Firm level variables</i>			
20<employees<200 ^(b)	.2614*** (0.017)	.3001*** (0.082)	.2994*** (0.084)
200<=employees<2000	.4618*** (0.018)	.4746*** (0.090)	.4742*** (0.087)
employees>2000	.4096*** (0.018)	.411*** (0.091)	.4114*** (0.087)
agriculture ^(c)	-.5878*** (0.063)	-.3999 (0.278)	-.3995 (0.288)
mining/energy	.6023*** (0.037)	.6524*** (0.242)	.6521*** (0.245)
processing	.0055 (0.026)	.1097 (0.137)	.1074 (0.125)
traffic/media	.0724*** (0.024)	.2004 (0.131)	.1983 (0.128)
construction	.2495*** (0.026)	.1472 (0.143)	.1479 (0.156)
wholesale	.2196*** (0.020)	.2161** (0.109)	.2152* (0.112)
services	-.1115*** (0.022)	-.0843 (0.105)	-.084 (0.099)
banking/insurance	.0606** (0.027)	.0298 (0.140)	.031 (0.118)
public sector	.0815*** (0.018)	.2036** (0.096)	.2018** (0.092)
<i>Personal attitudes</i>			
afraid to lose job	.0041 (0.012)	-.0196 (0.063)	-.0187 (0.059)
satisfied w/ job	.0064** (0.003)	-.0171 (0.016)	-.0165 (0.016)
lazy	-.0038 (0.004)	-.0024 (0.019)	-.0023 (0.019)
risk taker	.0155*** (0.002)	.0118 (0.013)	.0121 (0.014)
constant	4.933*** (0.119)	5.166*** (0.657)	5.157*** (0.588)
16 region dummies	Yes	Yes	Yes
9 occupation dummies	Yes	Yes	Yes
η^2		3.48 (0.09)	2.52 (0.13)
log likelihood	-4.3e+04	-1.3e+04	-1.3e+04
N	5060	5060	5060

Note: The dependent variable is the number of days absent due to illness. Reference categories are: (a) full-time for 'job status', (b) less than 20 employees for 'firm size', (c) Manufacturing for 'sectoral dummies'. Column (1): standard Poisson regression. Column (2): Negative Binomial regression. Column (3) is a negative binomial two-step quasi-maximum likelihood estimator (QMLE) implying fully robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

²¹That a Negative Binomial model gives a better fit to our data than a Poisson model is also illustrated in Figure 1 in the appendix, which plots the predicted distributions from both models alongside with the observed distribution of absenteeism.

TABLE 5: 2-STEP QMLE ESTIMATIONS, SUBSAMPLES.

	by sex ^(a)		by worker class ^(b)			
	(male)	(female)	(blue collar)	(white collar)		
managers taxed too little	.2078***	.2397***	.3725***	.1963***		
<i>N</i>	(0.078) 2858	(0.088) 2202	(0.121) 1464	(0.074) 3027		
			by hierarchy in occupation ^(c)			
			(low)	(medium)	(high)	
managers taxed too little			.5216***	.2009***	.1595	
<i>N</i>			(0.147) 750	(0.077) 2951	(0.104) 1359	
			by income quartile ^(d)			
			(1st Q)	(2nd Q)	(3rd Q)	(4th Q)
managers taxed too little			.6106***	.1658	.189*	.1884*
<i>N</i>			(0.168) 866	(0.108) 1260	(0.098) 1448	(0.101) 1486

Note: The full sample is split by: (a) male and female respondents, (b) blue and white collar respondents, (c) three skill-related hierarchy levels in occupation, (d) income quartiles of the 2005 SOEP wave. All estimations are two-step quasi-maximum likelihood (QMLE) implying fully robust standard errors. The dependent variable is 'number of days absent'. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.2 Subgroups - taxation and relative deprivation

In this section we analyze whether the connection between perceived unfairness in taxing the rich and willingness to comply with work norms is a “local” phenomenon or whether it is found throughout a wide range of socio-economic classes. Table 5 presents the QMLE results for various subsamples. To begin with, it has been frequently observed in the social comparisons literature that women and men are differently affected by violations of social norms (see e.g. Clark 2003). Interestingly, the association of the belief that managers are taxed too little with our chosen measure of work effort does not systematically differ between genders – the fairness gap is very similar for men and women. This is not the case when blue and white collar workers are considered: The fairness gap for blue collar workers is almost twice as large as the one for those working in white collar jobs. Yet, in both subgroups the coefficient on tax unfairness is highly significant.

To further check whether socio-economic status matters, we split the sample up along other class dimensions. The middle panel of table 5 presents the results for three different skill-related hierarchy levels within an individual’s broad occupation, distinguishing between low, medium or high hierarchy level. The coefficients are positive at all three levels, but the magnitude declines in hierarchy level and at the highest level the effect is not significant anymore. When splitting the sample up according to income quartiles (bottom panel of table 5), we obtain a similar pattern. The fairness gap is by far largest for the lowest-ranked group, where it is more than three times the size of the gap in the other groups. The coefficient for the fourth income quartile is still weakly significant, once again suggesting that the behavioral consequences of perceived unfairness in taxing the rich are not purely a phenomenon to be found in lower income groups.

The finding that the coefficient of the manager taxation indicator is larger in size for

lower ranked individuals and that it tends to decrease when moving up the social ladder is consistent with the concept of relative deprivation (Runciman 1966), which has recently attracted attention among economists in the social comparisons literature (see e.g. Ferrer-i-Carbonell 2005). This concept stipulates that individuals feel grievance when others possess things one does not have (but feels entitled to), and this grievance rises with distance to the privileged social group. To the extent that greater grievance is also accompanied by greater behavioral responses, our result that low-income individuals react more strongly to perceived tax privileges of the rich are well in line with this hypothesis. In our case the trigger of relative deprivation has a different dimension from the one along which deprivation rises - the trigger is of the dimension “tax payments” while the extent of deprivation is related to “rank” on a positional scale. That comparison processes may go well beyond one-dimensional comparisons of income has recently been shown by Abeler et al. (2009). Another possible interpretation of our heterogeneous results by sub-groups is that low-income individuals might have more limited opportunities to evade taxes. If low-income individuals have less scope to evade taxes, we would expect fairness spillovers to other domains of life to be stronger for that group, and hence we would expect them to react more strongly by adjusting work effort.

5 Robustness checks

In the previous section, we have uncovered a strong association between perceived unfairness in taxing the rich and absenteeism, which holds even after conditioning on a considerable number of observable characteristics and throughout most of the subsamples. In this section, we address the issue of potential remaining unobserved heterogeneity. Particularly, we look into whether fairness concepts other than tax fairness may drive the results. We also provide evidence from Rosenbaum-type sensitivity tests, showing that in order to annihilate our main result, any remaining omitted factors would have to exhibit implausibly strong associations with absenteeism and fairness beliefs.

5.1 Alternative fairness concepts

So far we haven’t considered the respondents’ *own* tax burden. It may be argued that the belief that managers pay too little in taxes is positively related to one’s own tax rate. Then, the coefficients on manager taxation presented so far may be confounded with another mechanism that is completely independent from fairness considerations: a higher tax rate reduces an individual’s net income or, equivalently, the expected loss from being detected, which calls for higher levels of shirking according to a standard neoclassical

model. The GSOEP allows us to calculate the average tax rate individuals effectively face, as respondents are asked for their gross income as well as for their net income. We take the difference between these two variables and divide it by gross income. This effective average tax rate is included as an additional regressor. As a benchmark, column (1) of table 6 reproduces the effect from the full specification of the QMLE model from the last column of table 4. Column (2) shows the results when the effective average tax rate is added (only the coefficient of the additional regressors and manager taxation are shown in this table). The effect of the tax unfairness indicator remains very stable.

A related issue is that the question on manager taxation explicitly asks the respondent to evaluate the tax burden of the rich in comparison to 'other groups'. Hence, it could be argued that labeling managers' tax burden as 'too low' may be just another way of stating that your own tax burden is unfairly high. The overall aim of this paper is to provide evidence that perceived injustice in taxation may spill over to other areas than taxation itself. For this purpose, it is largely irrelevant why individuals think the rich are being taxed too little: The assumption that the source of this belief is indeed perceived tax unfairness is sufficient. Further controls are needed, however, if the argument equates tax fairness to income fairness, in the sense that stating own taxation to be unfairly high may be equivalent to stating that own net income is unfairly low.

The conjecture that tax fairness coincides with concepts of income fairness and that it is this kind of fairness that drives our results is a fundamental objection, since ultimately it questions whether tax fairness presents a distinct fairness category at all.²² Fortunately, the GSOEP allows us to control for income fairness beliefs as well. Fairness perceptions of own wage income are collected in the GSOEP by asking "Is the income that you earn at your current job just, from your point of view? [Yes/No]." The third column of table 6 shows the coefficient of fairness perceptions after including this variable. When compared to the benchmark coefficient shown in column (1), the coefficient of tax fairness beliefs remains virtually unaltered in column (3). In other words, these results do not suggest that an evaluation of managers' taxes as being too low is confounded with perceiving one's own income as unjust. The GSOEP also allows us to control for whether individuals think managers earn too much. It asked its participants "How high on average is the monthly

²²It should be emphasized that discussions of the fairness of taxation are an integral part of mainstream public economics. A discussion of the principles of just taxation is found in many textbooks of public finance. For example, in what could be called the epitome of public economics textbooks, Musgrave (1959) devotes two entire chapters to tax equity issues. An example that illustrates how dedicated these discussions can be is the so called Musgrave/Kaplow Exchange. Starting in one, then continued in another journal, Musgrave and Kaplow debated over four years on whether the concept of horizontal tax equity has any normative significance aside from vertical equity and on how these equity concepts relate to the goal of efficiency. (The Musgrave/Kaplow Exchange refers to Kaplow, 1989, Musgrave, 1990, Kaplow, 1992 and Musgrave 1993.) Clearly, the discussion on whether tax equity has any normative significance besides other principles is not a strict proof of its relevance for individual behavior, but it provides further anecdotal evidence that people are affected by tax equity considerations.

TABLE 6: ROBUSTNESS CHECKS.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
managers taxed too little	.2558*** (0.061)	.241*** (0.061)	.2566*** (0.061)	.1783** (0.073)	.2572*** (0.061)	.2532*** (0.061)	.2532*** (0.061)	.2534*** (0.061)	.1608** (0.075)	.2111*** (0.074)
effective average tax rate		-.1152 (0.292)							-.3453 (0.366)	
own income unfair			-.0042 (0.059)						.012 (0.072)	
manager income unfair				.1936** (0.077)					.1816** (.077)	
leftist/right					-.0067 (0.016)				-.0314* (0.019)	
redistribution preference						.1444** (0.063)			.0575 (0.079)	
pessimist							-.0014 (0.062)		-.0969 (0.076)	
life satisfaction								-.0087 (0.021)	.0189 (0.025)	
59 controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	5060	4983	5045	3391	4978	5043	5048	5056	3267	3267

Note: All estimations are two-step quasi-maximum likelihood estimators (QMLE) implying fully robust standard errors. The dependent variable is the number of days absent due to illness and various additional controls are added to the full specification in the count data models. Column (1) shows the reference coefficient from table 4. Column (2) adds the respondent's effective average tax rate, column (3) adds an indicator for whether the individual perceives his own income to be unfair, column (4) adds an indicator for whether the individual perceives managers' incomes to be unfair, column (5) adds a variable that measures the respondent's position within the political spectrum (lower values indicate a leftist stance), column (6) adds an indicator for whether the respondent believes that income is mostly determined by luck, column (7) includes an indicator for whether the respondent is pessimistic about the future, column (8) adds a variable that measures how satisfied the respondent is with life overall (higher values indicate higher satisfaction levels), the specification in column (9) includes all additional variables. Because the inclusion of the 'managers' income' question significantly reduces the sample size, columns (4) and (9) cannot be compared to column (1). To allow for a comparison, we add reference column (10), which shows the reference coefficient when the specification from column (1) is estimated on this smaller sample from column (9). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

net income of a manager on the board of directors of a large company? Would you say that this income has a just relation to the job demands? [Yes/No]”. As can be seen in column (4), the perception of manager incomes as unfair is also associated with a higher number of days absent, yet the coefficient on manager taxation still suggests a 20% higher level of absenteeism for those who believe the tax system to be unfair. The coefficient is not as precisely estimated as before, yet still significant at the 5% level. The imprecision stems in part from the way this question is asked: respondents were only asked the fairness part if they could specify how much they think managers earn. This causes a drop in the number of observations by roughly one third. Due to the samples being different, the coefficient on manager taxation should not be compared to the benchmark in column (1). Rather, in column (10) we show a benchmark coefficient from a QMLE estimation of the specification shown in column (1), estimated on the restricted sample that results from the non-responses to the ‘manager income fairness’ question. This coefficient in column (10) is 0.21, and so the drop to 0.18 in column (4) suggests that 85% of the original effect remain. This large part of the original coefficient then cannot be due to perceiving managers’ incomes to be unfair. In the end, this gives us some confidence that, while tax fairness and income fairness may have some overlap, the fairness gap is not confounded with income fairness.

5.2 Preference for redistribution

A related concern is whether a preference for redistribution may be confounded with the manager tax coefficient, too. Someone who states that the rich are taxed too little may in essence be concerned about insufficient levels of redistribution from the rich to other parts of the population. In column (5), we thus add a control for the respondent’s position within the political spectrum. Lower values indicate a leftist stance, which can be assumed to go with a preference for redistribution. Because preferences for redistribution are not necessarily fully captured in political views, column (6) includes an indicator for whether the respondent believes that income is mostly determined by luck. The notion that one’s position in the income distribution is a matter of fate can be accompanied by a propensity to support redistributive policies, e.g. because such beliefs also imply little trust in upward social mobility (Piketty 1995; Alesina and Giuliano 2009). While the political views do not show a significant coefficient, believing in luck as the determinant of income is significantly associated with 15% more sick days.²³ Interestingly, the association of a preference for redistribution with absenteeism seems to be independent of the tax

²³This is interesting in its own. Alesina and Angeletos (2005) introduce the disutility stemming from the perception that luck determines income in an additive-separable manner, and hence, as having no behavioral affects. The question of how to introduce fairness into standard neoclassical utility functions is a question not adressed in this paper. However, our results can also be seen as evidence for justifying incentive shaping variants.

fairness perceptions – which still indicate 28% higher levels of absenteeism.

5.3 'Complainer attitudes'

Some individuals may have a negative attitude towards many things in general. Such attitudes may in part be triggered by being sick often, and also lead individuals to assess the taxation of others as unfair – as a way of expressing a generally negative stance. Aside from this reverse causality, pessimism acts as another variable that captures beliefs about social mobility. Column (8) adds a variable which indicates whether the respondent is 'pessimistic about the future'. From the coefficient, it seems that such a disposition is unrelated to absenteeism and tax fairness. There is some importance to this result: finding pessimism to be a confounder of the tax fairness coefficient would have meant that it is not even another fairness category driving our results, but rather a negative view of life prospects. Some individuals may loosely be termed 'complainers'. Their 'complainer' attitude may cause them to lament about the tax system more often and at the same time be associated with having more sick days. To the extent that such attitudes are not fully captured in the 'pessimist' control variable, they can still bias our estimates. As a further robustness check we therefore use a GSOEP question on general life satisfaction. The question reads: "How satisfied are you with your life, all things considered? [scale 0-10]". The results after including this additional regressor are shown in column (9) of table 6, where the coefficient on manager taxation remains stable and precise. The fact that being dissatisfied with life in general is not associated with more sick days suggests that the control variables of the benchmark specification are already holding all relevant factors constant that life satisfaction might proxy for.

The 'complainer' attitude may partly be an ingrained personality trait, and it may partly be triggered by positive or negative life events. It has been shown that life satisfaction reacts to important life events, such as marriage, widowhood, birth of a child (Clark et al. 2008). If these events change life satisfaction temporarily or permanently, and they also change a person's attitude toward taxation and absenteeism, then life satisfaction is exactly the proxy variable we need, in order to correct for the unobserved 'complainer' attitude. However, we cannot rule out the possibility that life satisfaction is subject to shocks that make it deviate temporarily from the underlying unobserved attitude while it is really only the underlying attitude that determines sick days and fairness perceptions. The shocks on the other hand may only have an impact on life satisfaction itself but not on views concerning taxation – think of 'the little things in life', e.g. a smile from the cashier at the gas station right before the GSOEP interview takes place. In such a setting, we would really like to partial out the effect of the underlying attitude, but life satisfaction is a flawed indicator for it because it also includes the effects that the shocks

have. Thus, life satisfaction will give a biased estimate of the underlying effect of the 'complainer' attitude, and as a consequence all other coefficients could be biased as well.

A way to correct for such unobserved heterogeneity has been proposed by Griliches and Mason (1972).²⁴ It involves instrumenting life satisfaction – which in this case does not meet the proxy variable assumptions – with a second measure for the underlying unobserved factor and is technically equivalent to remedies for the classical errors in variables problem. A valid instrument must not be subject to the same shocks as the instrumented variable. Put differently, the instrument must not be correlated with the shocks that affect answers to the life satisfaction question. Now, what constitutes a valid instrument is largely determined by how we think about the shocks that affect life satisfaction. If we believe them to be very short lived, as in 'having a bad day' on the day of the interview then lagging life satisfaction by one period provides a valid instrument. This is true because, e.g. having had a 'bad day' at last year's interview is actually unlikely to be correlated with anything. If we believe that events such as marriage affect only life satisfaction but not attitudes towards taxation, one lag may not be good enough. It has been shown that life satisfaction usually returns to its baseline level after such events but that this may take a while – up to a few years after the event (Clark et al. 2008). Because there is no way of knowing which case is closer to the truth, we choose life satisfaction lagged by one period and lagged by five periods as instruments, employing them both separately in two different specifications.²⁵ The longer lag length accommodates the case in which the shocks that make life satisfaction deviate from the underlying attitude last over several years. Table 10 in the appendix shows that both lagged values of life satisfaction are sufficiently correlated with contemporaneous life satisfaction in the first stage regression, and that the coefficient on manager taxation remains stable after instrumenting.²⁶ The comforting result of this exercise is that it does not really matter if we think about the underlying attitudes as being captured in life satisfaction or as deviating from life satisfaction, in both cases the manager tax fairness coefficient remains stable.

5.4 Simulated confounder

Even though we have included numerous and diverse control variables, there might be a worry that there remain omitted variables. We therefore conduct a robustness check based on a simulated confounder in the spirit of Rosenbaum and Rubin (1983). The idea

²⁴See also Griliches (1977), Chamberlain (1977) as well as Blackburn and Neumark (1993, 1995).

²⁵Unfortunately, these instruments do not allow to correct for persistent shocks to life satisfaction that do not affect other regressors. However, we believe that most such persistent shocks will also affect attitudes towards other things, such as taxation – and then we *want* the shocks to be part of life satisfaction.

²⁶Contrary to the count-data results, in the OLS specifications higher life satisfaction is associated with higher levels of absenteeism.

is to simulate a confounder that is correlated with absenteeism and with fairness beliefs about manager taxes, and to check the sensitivity of the results with various strengths of that simulated confounder. Rosenbaum and Rubin (1983) developed this method for the case of a binary outcome, a categorical regressor, and a binary simulated confounder. In order to use this method for a multi-valued outcome, we follow the suggestion of Nannicini (2007) of transforming the outcome variable into a dummy variable for the purpose of the simulation of the confounder. Let Y denote a binary variable indicating whether absenteeism is above the mean ($Y = 1$) or below the mean ($Y = 0$), and let T denote our binary regressor of beliefs about manager taxes. The simulated confounder is a binary variable U that has a joint distribution with T and Y which can be described by the four parameters: $p_{00} = P(U = 1|T = 0, Y = 0)$, $p_{10} = P(U = 1|T = 1, Y = 0)$, $p_{01} = P(U = 1|T = 0, Y = 1)$ and $p_{11} = P(U = 1|T = 1, Y = 1)$. Nannicini (2007) and Ichino et al. (2008) show that the strength of the correlation of the confounder with Y and T depends on the parameters $d = p_{01} - p_{00}$ and $s = p_{11} - p_{10}$, with $p_{11} = P(U = 1|T = 1)$ and $p_{10} = P(U = 1|T = 0)$. As suggested by Nannicini (2007) we simulate the confounder for different combinations of d and s . We then include it into the regression model of column (6) in table 3.²⁷

Table 7 shows the simulation results. We still find significant effects for very strong confounders. The borderline case is the entry for $s = 0.3$ and $d = 0.5$ in the table. Here, we still find a positive effect of unfairness beliefs on absenteeism of 0.84 days that is statistically significant at the 10%-level, even after including a very strong binary confounder into the regression. That confounder has a partial effect on the probability of having above-average absenteeism of 34 percentage points, and on unfairness beliefs about manager taxes of 24 percentage points. This is an extremely strong confounder. For comparison, our 'health score' variable has to increase from 1 (its lowest value) to 5 (its highest value) in order to generate the same effect on the probability of having above-average absenteeism, and our health satisfaction variable does not even generate this effect when it moves from 0 (its lowest value) to 10 (its highest value). To put the effect of the confounder on beliefs of manager taxation of 24 percentage points into perspective, consider again the descriptive results from table 1. There, the largest observed difference between the proportion of people saying that manager pay too little taxes was that between individuals with a 'low' and a 'high' hierarchy in their occupation, and that difference was roughly 20 percentage points, hence less than the effect of our confounder on fairness beliefs about manager taxes. We conclude from this exercise that if our result was purely due to an omitted variable, than this omitted variable would need to have an effect on

²⁷Our procedure is based on the Stata module `sensatt` by Nannicini (2007). The difference is that we do not introduce the simulated confounder into a matching estimator, but into a linear OLS regression. We also present our results in a slightly different way than Nannicini (2007) or Rosenbaum and Rubin (1983). We express the strength of the correlation of the simulated confounder with the outcome and the regressor not in terms of log odds ratios but in terms of partial effects.

TABLE 7: SENSITIVITY CHECKS.

		d = 0.1	d = 0.2	d = 0.3	d = 0.4	d = 0.5	d = 0.6
s = 0.1	β	1.45***	1.41***	1.39***	1.37***	1.33***	1.31***
	s.e.	0.45	0.45	0.45	0.45	0.45	0.45
	δ_A	0.07	0.13	0.19	0.25	0.31	0.36
	δ_M	0.08	0.08	0.08	0.07	0.07	0.07
s = 0.2	β	1.35***	1.28***	1.23***	1.16**	1.09**	1.03**
	s.e.	0.46	0.47	0.47	0.47	0.48	0.47
	δ_A	0.06	0.13	0.19	0.26	0.32	0.38
	δ_M	0.16	0.16	0.16	0.16	0.16	0.16
s = 0.3	β	1.23**	1.16**	1.05**	0.93*	0.84*	0.75
	s.e.	0.50	0.50	0.50	0.50	0.50	0.50
	δ_A	0.07	0.13	0.20	0.27	0.34	0.41
	δ_M	0.25	0.24	0.24	0.24	0.24	0.24
s = 0.4	β	1.07**	0.97*	0.82	0.68	0.56	0.38
	s.e.	0.53	0.54	0.54	0.55	0.55	0.55
	δ_A	0.07	0.15	0.22	0.30	0.38	0.45
	δ_M	0.32	0.32	0.33	0.32	0.32	0.32

Note: The table shows the results of sensitivity checks in which a simulated confounder has been added to the baseline regression model (6) of table 3. The strength of the confounder rises with the parameters d and s (see text for details). In the table, the rows labeled β show the estimated effects of beliefs about manager taxes on absenteeism after the confounder has been introduced into the regression. The rows labeled 's.e.' show the associated standard errors. δ_A denotes the partial effect of the confounder on absenteeism, and δ_M denotes its partial effect on fairness beliefs about manager taxes. With rising δ_A and δ_M the confounder becomes stronger and it is to be expected that the estimated effect becomes weaker. For each combination of d and s we implemented 100 repetitions of the simulation. The standard errors are computed as an average of the within-imputation variance and the between-imputation variance, see Nannicini (2007, eq. 11). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

absenteeism as strong as a move from poor health to excellent health, and it would at the same time need to generate variation in beliefs about manager taxation larger than the differences between low-hierarchy and high-hierarchy workers. Given our broad range of included control variables, we find it hard to think of any omitted variable that could drive our results to such an important extent.

For the income and status sub-groups presented earlier, the same robustness checks (not reported here) as those presented in this whole section 5 deliver qualitatively very similar results as before, i.e., for workers in the first quartile of the wage distribution, the effect is generally high and significant, while it is lower and not significant for workers in the higher quartiles, and for blue collar workers the effect is stronger than for white collar workers. Overall, this section shows that the correlation between tax fairness perceptions and absenteeism is not due to preferences for redistribution or alternative fairness concepts. There is also little evidence to suggest the coefficient may be biased due to unobserved heterogeneity caused by being pessimistic in general or having a 'complainer' personality. Finally, our sensitivity checks based on a simulated confounder showed that an omitted variable would need to have very strong associations with absenteeism and with fairness beliefs in order to be able to generate our results. Given the large set of observed covariates, we find it implausible that there remains such an important unobserved variable.

6 Conclusion

Everybody knows someone who complains about injustice in taxing the rich. Whether such complaints translate into economically relevant behavior is the core question of this paper. We use a large-scale German data set and investigate whether the belief that the rich don't pay a sufficient amount of taxes affects work morale. The results provide first evidence suggesting that there is indeed a connection between an agent's complaining over injustice in taxing the rich and his propensity to work hard, and that this connection is surprisingly strong. On average, the belief that the top income earners don't contribute a fair share in taxes is associated with a 20 percent increase in days absent from work due to illness, our measure of work morale. The results prove robust to adding standard labor market controls as well as a wide variety of individual attitudes that may affect absenteeism but that are not generally available in other data sets. The inclusion of these individual attitudes does not affect our estimated coefficient, suggesting that it is unlikely that any further unobserved characteristics bias our results. In addition, Rosenbaum-type sensitivity tests provide compelling evidence that any remaining omitted variable would have to exhibit implausibly strong associations with absenteeism and fairness beliefs in order to spuriously generate our results.

The contribution of this paper is twofold. First, we deal with the question of how taxes affect the economy. It is well established that taxes can deter economic activity via reduced monetary incentives. We provide evidence that perceived injustice in taxation may crowd out effort as well. Second, and at a more general level, we build on the recent economic literature on fairness. Not only are our results well in line with the established hypothesis that in addition to material self-interest, fairness matters for economic behavior – we also add several new aspects to this literature. Most importantly, responses to perceived injustice in a certain area may not be restricted to that area, but rather 'fairness spillovers' may be present. In addition, these responses – though indirect – may be of substantial magnitude and associated with large economic costs.

One reason why we found relatively large effects may lie in the stylized fact that Europeans believe success to be a matter of luck rather than of hard work (Alesina and Angeletos 2005), and that Europeans generally believe social mobility to be low (Bénabou and Tirole, 2006). Thus, it can be assumed that in Germany grievance over not belonging to the upper social strata is rather high, and so people may be especially averse to tax breaks for the wealthy. It should be interesting to see, whether in a country like the United States, where people believe in social mobility and in being in charge of their own destiny, a link between perceived unfairness of taxation and work effort can be found, too.

Provided that the effects can be shown to be undoubtedly causal – a task left for future

research – they suggest that the excess burden of taxation may be quite different from what is usually assumed. Traditionally, welfare costs of taxation are assessed in terms of distorting monetary incentives. However, our analysis revealed that there are other channels through which tax policy may have an impact on economic behavior. Neglecting these fairness-induced costs of taxation bears the risk of arriving at misleading policy recommendations. At the same time it is also important to realize that the implication of this research cannot be higher tax rates for managers or the wealthy in order to avoid the “extra” excess burden. First, it is unclear whether beliefs about fairness in taxation correspond to real tax burdens of the wealthy at all. Even if the fairness beliefs emerge from correct beliefs about the tax system, positive welfare effects at the bottom of the income distribution must be weighed against possibly negative welfare effects induced by behavioral responses at the upper end of the income distribution. In the end, this study should be considered as a pointer that quite likely there are hidden effects of taxation in areas that have not been considered thus far, and that the extent of these effects may be large.

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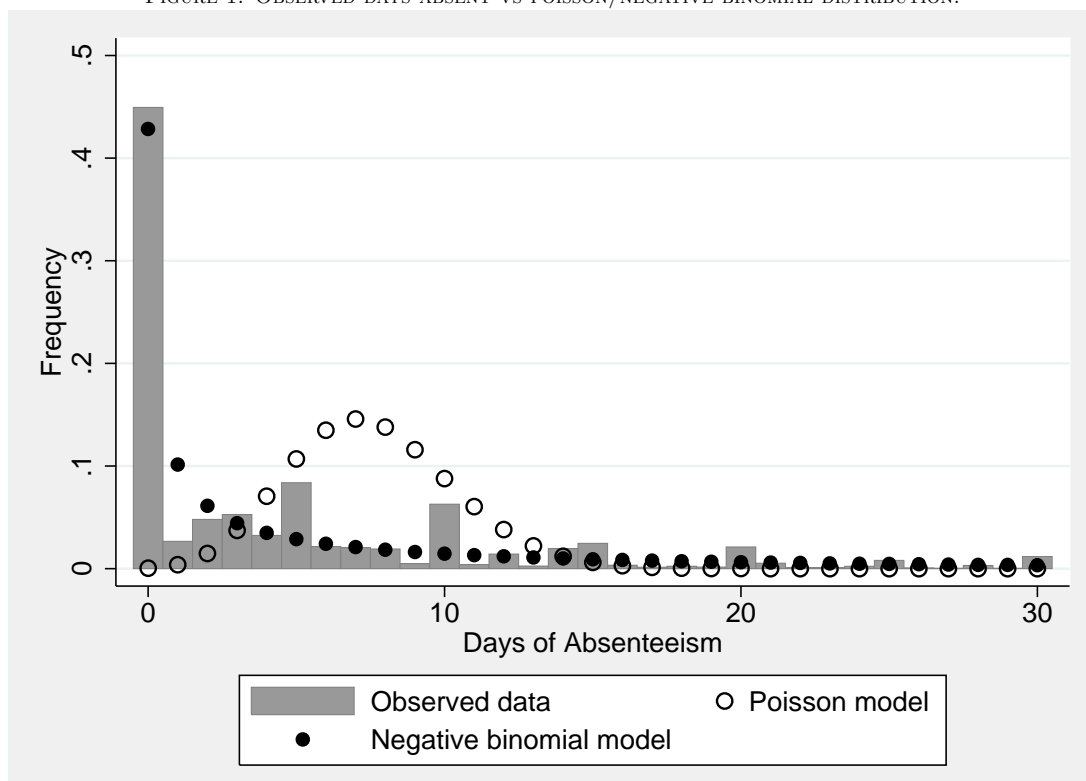
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Appendix

FIGURE 1: OBSERVED DAYS ABSENT VS POISSON/NEGATIVE BINOMIAL DISTRIBUTION.



Note: The figure compares the observed distribution of the days of absenteeism with the distributions predicted from unconditional Poisson and Negative Binomial (Negbin II) count-data models. Due to overdispersion (mean 7.57, overdispersion parameter 4.09), the Negative Binomial model gives a better fit to the data than the Poisson model. To ensure an easier readability of the graph, it is truncated at 30 days of absenteeism (95th percentile). The 99th percentile of absenteeism is at 85 days of absenteeism, the maximum is 245 days. Number of observations N=5060.

TABLE 8: DESCRIPTION OF VARIABLES.

Variable	Description
Main variables	
absenteeism	number of days absent in the year of survey. Asked retrospectively in 2006.
absenteeism dummy	indicator variable, takes on value 1 if absenteeism >0.
managers taxed too little	indicator variable, takes on value 1 if respondent thinks managers are being taxed too little.
unskilled taxed too much	indicator variable, takes on value 1 if respondent thinks the unskilled are being taxed too much.
health score	'How would you describe your current health?'. Scale: 'Poor' (1) to 'Very good' (5).
health satisfaction	'How satisfied are you with your health?'. Scale: 'totally unhappy' (0) to 'totally happy' (10).
Personal characteristics	
gross income	gross monthly income in 1000 Euros.
age	age in years.
agesq	age in years squared.
male	indicator variable, 1 if male.
children	the number of children <16 years in the household.
foreign	indicator variable, 1 if non-German citizen.
schooling	years of schooling (includes tertiary education and vocational training).
Job related variables	
tenure	tenure with current employer.
tenure sq	tenure with current employer squared.
full time experience	years of full time experience.
full time experience sq	years of full time experience squared.
part time experience	years of part time experience.
part time experience sq	years of part time experience squared.
part time	indicator variable, 1 if currently part time employed.
marginally employed	indicator variable, 1 if currently marginally employed.
Firm level variables	
20<employees< 200	indicator variable, 1 if number of employees at current employer 20<employees<200.
200<=employees<2000	indicator variable, 1 if number of employees at current employer 200<=employees<2000.
employees>2000	indicator variable, 1 if number of employees at current employer >2000.
agriculture	indicator variable, 1 if employed in this sector.
mining/energy	indicator variable, 1 if employed in this sector.
processing	indicator variable, 1 if employed in this sector.
traffic/media	indicator variable, 1 if employed in this sector.
construction	indicator variable, 1 if employed in this sector.
wholesale	indicator variable, 1 if employed in this sector.
services	indicator variable, 1 if employed in this sector.
banking/insurance	indicator variable, 1 if employed in this sector.
public sector	indicator variable, 1 if employed in this sector.
Personal attitudes	
afraid to lose job	Indicator variable, 1 if individual is 'very concerned' or 'somewhat concerned' about job security.
satisfied w/ job	'How satisfied are you with your job?'. Scale: 'totally unhappy' (0) to 'totally happy' (10).
lazy	'I see myself as someone who tends to be lazy.' Scale: 'not at all' (1) to 'applies perfectly' (7).
risk taker	'Are you prepared to take risks?'. Scale: 'avoid risks' (0) to 'fully prepared' (10).
Robustness checks	
effective avg tax rate	1-(net monthly income in Euros/gross monthly income in Euros).
leftist/right	'How would you rate your political views?' Scale: 'Far left' (0) to 'Far right' (10).
redistribution preference	indicator, 1 if respondent gave at least (5) on a (7)-point scale ('disagree' (0) – 'agree' (7)) to the question 'What a person achieves in life is above all a question of fate or luck'.
own income unfair	indicator variable, 1 if respondent thinks her/his own pay is unfair.
manager income unfair	indicator variable, 1 if respondent thinks manager pay is unfair.
pessimist	indicator variable, 1 if individual states to be either 'pessimistic' or 'more pessimistic than optimistic' about the future.
life satisfaction	'How satisfied are you with your life' Scale: 'not at all' (0) to 'fully' (10).
Other	
region dummies	16 indicator variables for the German states.
occupation dummies	3 blue collar indicator variables: low, medium, high skilled, 3 white collar indicator variables: low, medium, high skilled, 3 public servant indicator variables: low, medium, high skilled.

TABLE 9: SUMMARY STATISTICS.

	<i>N</i>	Mean	Std. Dev.	Min	Max
<i>Main variables</i>					
absenteeism	5060	7.57	17.30	0	245
absenteeism dummy	5060	0.55	0.50	0	1
managers taxed too little	5060	0.72	0.45	0	1
unskilled taxed too much	5055	0.54	0.50	0	1
health score	5060	3.55	0.82	1	5
health satisfaction	5060	7.01	1.90	0	10
<i>Personal characteristics</i>					
gross income	5060	2.78	1.83	0.25	35
age	5060	43.02	10.08	18	74
male	5060	0.56	0.50	0	1
children	5060	0.38	0.48	0	1
foreign	5060	0.05	0.23	0	1
schooling	5060	12.87	2.79	7	18
<i>Job related variables</i>					
tenure	5060	12.14	10.12	0	48.8
full time experience	5060	16.80	10.91	0	47
part time experience	5060	2.62	5.29	0	45
part time	5060	0.19	0.39	0	1
marginally employed	5060	0.03	0.17	0	1
<i>Firm level variables</i>					
employees<= 20	5060	0.21	0.40	0	1
20<employees< 200	5060	0.30	0.46	0	1
200<=employees<2000	5060	0.23	0.42	0	1
employees>2000	5060	0.26	0.44	0	1
agriculture	5060	0.01	0.10	0	1
mining/energy	5060	0.01	0.12	0	1
manufacturing	5060	0.21	0.41	0	1
processing	5060	0.05	0.22	0	1
traffic/media	5060	0.06	0.24	0	1
construction	5060	0.05	0.21	0	1
wholesale	5060	0.11	0.32	0	1
services	5060	0.13	0.34	0	1
banking/insurance	5060	0.05	0.23	0	1
public sector	5060	0.30	0.46	0	1
<i>Personal attitudes</i>					
afraid to lose job	5060	0.60	0.49	0	1
satisfied w/ job	5060	7.04	1.92	0	10
lazy	5060	2.20	1.45	1	7
risk taker	5060	4.85	2.14	0	10
<i>Robustness checke</i>					
effective avg tax rate	4893	0.33	0.12	-0.14	0.7
leftist/right	4978	4.71	1.74	0	10
redistribution preference	5043	0.24	0.43	0	1
own income unfair	5045	0.33	0.47	0	1
manager income unfair	3391	0.75	0.43	0	1
pessimist	5048	0.26	0.44	0	1
life satisfaction	5056	7.19	1.61	0	10

TABLE 10: INSTRUMENTAL VARIABLE ESTIMATES.

2nd stage, dependent variable is days absent due to illness in period t .			
managers taxed too little		1.69*** (0.46)	2.07*** (0.51)
life satisfaction		.88* (0.50)	.86 (0.89)
<i>N</i>		5052	4129
1st stage, dependent variable is life satisfaction in period t .			
life satisfaction ($t-1$)		0.4*** (0.02)	
life satisfaction ($t-5$)			0.27*** (0.02)

Note: Instrumented variable is life satisfaction in period t , the instrument is life satisfaction in period $(t-1)$ in the first column, and life satisfaction in period $(t-5)$ in the second column. In both cases, a test of endogeneity fails to reject exogeneity of 'life satisfaction' in t . Estimations are linear IV, only select coefficients are reported, full specification is as in column (6) of table 3. Standard errors allow for clustering on the household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.