A glimpse through the veil of ignorance: equality of opportunity and support for redistribution

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Abstract

This study is an experimental investigation into preference for redistribution of income. It had been hypothesized that (belief in) equality of opportunity in a society diminishes support for the welfare state. This could potentially explain the low taxes and social benefits in the United States vis-a-vis Europe. To verify this hypothesis, participants in an experiment were assigned different "Probabilities of Winning" and matched in groups of four. Next, before finding out who would actually win, they selected preferred transfers to be paid by the winners to the group as a whole. It was found that the average transfers were about 20% lower in the sessions in which winning was determined by performance in a task rather than by sheer luck. This difference cannot be explained by overconfidence in predicting own score. It corroborates the conjecture that perceived determinants of success (i.e. whether poverty results from laziness or bad luck) affect the support for redistribution. On the other hand, greater inequality of opportunity measured simply by dispersion of Probabilities of Winning within a group did not lead to higher transfers.

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1 Introduction

One of the important roles of modern governments is to organize transfer of money from the rich to the poor. While the amount of wealth being redistributed is substantial in virtually all developed countries, individual differences are striking (see e.g. Alesina and Glaeser, 2004). This dispersion coincides with cross-country differences in prevailing opinion over necessity and optimal level of redistribution[1] (which, of course, should not be surprising in the democratic regime). Further, it is clear that transfers of wealth are costly, in that they involve substantial efficiency loss (see e.g. Browning, 1993). It is thus interesting to investigate what drives the support for redistribution – these needs could possibly be satisfied in a more cost-effective way.

Several such determinants have been suggested in the literature (see for example Alesina and Glaeser, 2004 for an overview). The most obvious factor is self interest – the "poor" or those who expect to be poor in the future have an incentive to tax the rich (see Meltzer and Richards 1981, Benabou and Ok, 2001). Support for welfare state might also depend on several other factors, for example social cohesion (see Lee and Roemer, 2006 for a discussion of racial heterogeneity).

A potentially important factor that receives a lot of attention recently is the perceived fairness of the division of wealth. It seems plausible that taxes and transfers are there partly because many citizens find pre-tax income distribution *unfair* and seek to improve upon it. It appears therefore fruitful to identify factors that could reinforce or inhibit this feeling of injustice, thus weakening or strengthening legitimization of the system. One such factor pertains to the way in which this distribution is generated – to the equality of opportunity for upward-mobility that individuals face.

This line of thinking can be traced back as far as to de Tocqueville and was recently revived i.a. by Alesina and Angeletos (2005). It posits that the more individual's lifetime earnings are thought to be determined by his or her place of birth, social status of parents, etc. (that is, the more closed the society appears to be), the less legitimate existing differences in wealth are. This, in turn, creates rich soil for redistribution policies. Whenever, on the other hand, all individuals are believed to be endowed with a fair chance to succeed in attaining high social strata, transfers seize to be perceived as necessary to restore justice. In this way one can explain relatively strong support for redistribution in European countries and relatively weak observed in the US.

Indeed, according to the World Values Survey, less than 30% of US citizens think that "poor are trapped in poverty". In Europe the rate is about 60%. Interestingly, there is rather little empirical support for these beliefs (see Ayala and Sastre, 2002; Alesina and Glaeser, 2004; Glaeser, 2005). This "false

[1] Corneo and Gruner (2002) provide results of a survey in 12 countries. Fraction of respondents who "agreed" or "strongly agreed" that "It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes" varied from around 40% in the US and Australia, to 60-65% in West Germany and Norway, to over 80% in East Germany and Bulgaria.

consciousness" has become recently an interesting topic of study on its own (Benabou and Tirole 2005).

Two aspects of the alleged "entrapment" may be distinguished here, giving rise to two parts of the "fairness-legitimacy" hypothesis regarding the factors affecting the support for redistribution. First, equality of opportunities requires social mobility. Perceived *inequality* may thus result from the fact that citizens face highly divergent probabilities of reaching high social strata. We thus hypothesize that if they do, they will opt for higher redistribution (for short, we will refer to this as "Divergent Chances Hypothesis"). Second, the feeling of unfairness might have to do with the determinants of success being seen as unjustified. For example, climbing up the social ladder may require behavior seen as immoral (such as bribery) or simply pure luck, rather than skills and hard work (cf. Piketty, 1995; Fong 2001; Alesina and LaFerrara 2005). In Rawl's terminology, the latter quality is referred to as "equality as careers open to talents" while combination of the two constitutes "equality of fair opportunity" (Rawls, 1999, p. 57). The second part of the fairness-legitimacy hypothesis is thus that support for redistribution is greater when success or failure is determined by factors perceived as justified, such as skill and effort (we will call it the "Luck vs Skill hypothesis"). Fong (2001) and Alesina and LaFerrara (2005) show that those who think that "getting ahead in life" mostly takes effort and talent, generally oppose redistribution more that those who believe it is chiefly determined by luck and help of others. The impact of social mobility is less clear (Fong, 2005). Particularly, Alesina and LaFerrara (2005) find that "generic" measures of social mobility are insignificant when future own expected income is controlled for. Alesina and LaFerrara (2001) also propose (and provide some empirical support in survey data) that these two dimensions interact, i.e. mobility is a better substitute for equality of outcomes when the process is perceived as fair. In any case, it is difficult to verify, using the field data, whether the belief in equality of opportunity is an independent reason to oppose redistribution or merely a useful way to legitimize what is otherwise materially beneficial (Alesina and Glaeser, 2004, chapter 7).

The hypothesis that the difference in support for the welfare state between the US and Europe may be based on different perception of inequality found support in a study on "happiness" by Alesina et al. (2004), who conclude that disutility of inequality is statistically significant among European "poor" as well as leftists, whereas in the US only "rich" leftists seem to care about it. One interpretation is that inequality of outcomes is only troublesome when inequalities are perceived as unequal. Alternative ways of looking at these data are possible, however, and evidence from other studies (Clark, 2003; Schwarze and Härpfer, 2004) appears somewhat contradictory.

It seems thus desirable to investigate this "fairness-legitimacy" hypothesis experimentally. This would allow to verify the existence of the link between initial distribution of chances in the society and preference for redistribution in an environment free from cultural and institutional differences just mentioned, while controlling for monetary incentives.

The experimental design proposed here assumes a "thin" veil of ignorance, which admits a glimpse of one's future: Decision makers choose their preferred level of income tax (and resulting benefits) without knowing what their actual income would be but facing different prospects. For one, this approach allows focusing on the impact of ex-ante inequality (inequality of opportunity) on the support for welfare state. Besides, "grand" (or programmatic) redistribution is a long-run phenomenon (see Dixit and Londregan, 1996), it is thus natural to assume that voters have only more or less accurate *predictions* about the income of their families over the whole period during which a policy is effective.

Our results confirm the Luck vs Skill hypothesis in that the nature of determinants of success affects the willingness to support redistribution: higher transfers are favoured if winning depends on a random draw rather than performance in a task. The Divergent Chances Hypothesis finds no support, in that transfer choices do not respond to the dispersion of chances to succeed. It appears thus, as suggested by earlier field studies, that moral worthiness is more important than social mobility in shaping people's perceptions of equality of opportunity. Further than that, we conclude that perceptions of fairness of the process determining income are an independent source of support for redistribution, not merely an epiphenomenon.

The design of the experiment is presented in Section 2, Section 3 reports the results, Section 4 contains a discussion of the results, in relation to some other experimental evidence. Instructions can be found in the Appendix.

2 Design, procedures, predictions

2.1 Design

In order to test the hypotheses described above, we endowed the subjects with a "Probability of Winning" (winning a fixed prize of 30 euro) kept constant throughout the experiment. Next, in each of six periods, subjects were rematched in groups of four, such that dispersion of Probabilities of Winning (PoW) differed across periods. In this way dispersion of chances was manipulated within-individual and the observed impact on behavior allowed us to verify the Divergent Chances Hypothesis. The Luck vs Skill Hypothesis was verified by manipulating, between subject, the determinants of success, as described in Subsection 2.2.

In each period the groupmates' probabilities of winning were revealed to everyone. Participants were asked to indicate their favorable redistribution scheme – a transfer $t \in [0, 1]$ determining what part of the prize V each winner should share with the losers. These decisions were not revealed. After all the decisions were made, one period was picked to determine real payment. Prizes V were individually allocated, either randomly or based on performance in a task (see Subsection 2.2), in accordance with PoWs, such that each group had exactly 2 winners. Then, for each group one person's choice determined the transfer.[2] The earnings were given by the formula:

[2] Two alternative ways to elicit the preferred transfers suggest themselves: first, one could

$$earnings_i = \begin{cases} SF + V(1-t_j) + \frac{(1-\lambda)Vt_jw}{4} & \text{for winners} \\ SF + \frac{(1-\lambda)Vt_jw}{4} & \text{for losers,} \end{cases}$$

where SF equal to 5 euro denotes the show-up fee, V equal to 30 euro denotes the prize, t_j is the transfer rate chosen by the selected participant j, ($t_j \in [0,1]$), λ is the efficiency loss parameter and $w = 2$ is the number of winners in the group, such that $\frac{(1-\lambda)Vt_jw}{4}$ is the transfer obtained by every group member.

The proposition that proportional taxes are charged and the proceeds divided evenly (as lump sum benefit) is a standard way of simplistic modeling of redistribution (cf. Meltzer and Richards, 1981).

Parameter λ represents losses inherent in the process of collecting and redistributing taxes as well as losses due to distortionary effect of taxes on income base.

Each of the two values of lambda, $\lambda = 0$ and $\lambda = 0.3$, was used in a block of three consecutive periods. The first value is a natural benchmark. The other, while to some extent arbitrary, partly because empirical literature doesn't seem to offer a reasonably narrow range of plausible estimates of efficiency losses involved in taxing and transferring of income (see Allgood and Snow, 1998). In any case, it is sufficient to make (contrary to $\lambda = 0$) transfers unprofitable for players with intermediate Probabilities of Winning ($PoW = 0.4$ and $PoW = 0.5$). It is thus a moderate value: high enough to change monetary incentives for a large group of participants but low enough to avoid making transfers unacceptable. Including two different values of the parameter could possibly help discover an important interaction effect between the perceived inequality of opportunities and efficiency of the redistribution system. It also served as a robustness check.

Up to four levels of PoW were used in each session: these were either 0.2, 0.4, 0.6 and 0.8 or 0.1, 0.5, 0.5 and 0.9 (so in the latter case the two middle "classes" collapsed into one). These two varieties will be referred to as "distributions of PoWs".

To assess the impact of dispersion of chances on support for redistribution, each individual faced different combination of groupmates' PoWs in each round. The most equalized group type in the first distribution of PoWs included two participant with PoW equal to 40 percent and two with PoW equal to 60 percent (0.4, 0.4, 0.6, 0.6), the intermediate one was (0.2, 0.4, 0.6, 0.8) and the most unequal (0.2, 0.2, 0.8, 0.8). Note that each player could only participate in the intermediate group and one of the "extreme" groups (for instance, a player with PoW of 0.8 could not participate in the most equalized group) and indeed each

let participants vote on a redistribution scheme, second, some order statistics (preferable median) could determine the actual transfer level. The first strategy, used in several related experiments (e.g. Tyran and Sausgruber, 2002), is difficult to implement directly if more than two redistribution schemes are possible. In the current experiment there were 31 options, thus voting would require additional complexity, e.g. some participants taking role of politicians choosing platforms to vote for. The median, on the other hand, is not well-defined in a group of four and other order statistics (e.g. second highest) are less natural. Besides, participants with extreme Probabilities of Winning could feel their (extreme) choices would not matter anyway.

participant played in each of the two feasible group types at least once for each value of λ.[3] We can thus check the impact of increased dispersion of chances by comparing choices made by each individual in the less equal group with the choices in the more equal group, for example comparing the choice made by an individual with a PoW of 0.6 in the intermediate group and the most equal group. The same design was used and analogous inference can be made for the other distribution of PoWs.

2.2 Treatments

In order to verify the Luck vs Skill Hypothesis two conditions were used. Under "Random" condition, after the 6 periods of redistribution choices, winning/losing was determined by a random draw, in accordance with subjects' probabilities of winning. Under "Task" condition, after the 6 periods, individuals had to complete a competitive task (a quiz of 10 general knowledge and IQ-type questions). The number of correct answers and the response time were combined in the final score. The low-PoW subjects generally had to score higher in the quiz than the high-PoW subjects in order to win the prize.[4]

The sessions differed also on two other dimensions: first, the two different distributions of PoW were used as described in the previous subsection and, second, the order of the three-period blocks with a fixed value of λ was manipulated.

The eight sessions were thus run in a 2 X 2 X 2 (task/random X distribution of PoWs X order of λ-blocks[5]) full factorial design.

2.3 Procedures

The experiment was run in the CREED laboratory at the University of Amsterdam in March 2007. It was computerized using Z-tree (Fischbacher, 2007). In total 184 subjects, mostly undergraduate students, participated in eight session, 20 or 24 subjects in each. Thirty-nine percent of the participants were women; 62 percent studied economics or business, while the others came from a variety of other disciplines. The mean age was 23 years.

The subjects, recruited via e-mail announcements and registered on the CREED website, were seated in the lab and given general written instructions, including tables (see Appendix 1) describing the decision task. It was not revealed to subjects that periods 4-6 would involve a different efficiency loss than periods 1-3. Further, in two out of four Task treatments the nature of the task was not revealed – it was generally describe as one requiring "some skills, some

[3] The exact schedule is available from the author.

[4] The actual procedure used, guaranteeing that i) the chance of success is equal to PoW, ii) higher scores are generally rewarded and iii) there are exactly two winners in each group is available from the author upon request. Data analysis revealed that the procedure indeed worked, that is, the actual success rates were very close to the PoW.

[5] Order of λs was found not to affect the choices significanlty (at 5% level). This variable is thus disregarded in the analysis.

effort and some good decisions".[6] Once the subjects had read the instructions, the experimenter answered all arising questions and started the computer program. The subjects were first asked to report their height, based on which PoW was assigned. This seemingly peculiar procedure was used in order to assign PoWs randomly but still make the differences between PoWs perceived as unjustified. Manipulation checks confirmed that the latter goal was achieved – two thirds of participants though it was unfair that different subjects faced different probabilities of winning.

After three periods of transfer choices the experimenter distributed a new handout explaining that in the remaining periods only 70 percent of the Group Account would be redistributed (or, conversely, 100 percent would be distributed from now on, depending on the session). Directly before and right after having the risk resolved, the subjects answered several questions regarding their decisions and the evaluation of the procedures used in the experiment (see Appendix).

The experiment took about 60 minutes. Earnings, including a guaranteed show-up fee of 5 euro, ranged from 5 to 35 euro with an average equal to 18.45 euro.

2.4 Predictions

Dispersion of the probabilities of winning Discussing the predictions regarding behavior in the game we start with the most strict set of assumptions and gradually relax some of them. First consider a *risk-neutral selfish subject i* (an expected value maximizer). Denoting i's PoW by p_i, her expected utility in the game (disregarding the show-up fee) is given as:

$$\begin{aligned} EU_i &= p_i(V(1-t) + \frac{(1-\lambda)Vt}{2}) + (1-p_i)\frac{(1-\lambda)Vt}{2} \\ &= p_iV(1-t) + \frac{(1-\lambda)Vt}{2}. \end{aligned} \tag{1}$$

Maximizing with respect to the height of transfer[7] we find that such a subject will always opt for full redistribution ($t = 1$) if their probability of winning is

[6] In two other sessions the subjects were told that the task involved answering questions as quickly and as correctly as possible. The reason was twofold – first, it could be that an unknown task triggered different attitude than a known task and second, some participants could have learned the nature of the task from their peers participating in earlier sessions anyway.

[7] For ease of exposition I assume that participant i is selected to decide about transfers (while in fact any group member was equally likely to be decisive). The strategy whichi is optimal under this assumption will obviously remain optimal in all of the models considered below in which final allocations are carriers of utility (as in the classical model and e.g. Fehr and Schmidt, 1999). It is easy to show that it also holds true for the Process Fehr-Schmidt model (Trautmann, 2006) considered below, because ordering of expected earnings depends only on probabilities and not on selected transfers (thus the same choice is optimal, no matter what the group-mates are opting for).

lower than a threshold $\widehat{p} = \frac{(1-\lambda)}{2}$, and for no redistribution ($t = 0$) if $p_i > \widehat{p}$. Given the values of λ used, $\widehat{p}$ is equal to 0.35 (for $\lambda = 0.3$) or 0.5 (for $\lambda = 0$).

Note that the expected value maximizer's decision is unaffected by the current composition of the group, as long as the sum of probabilities of success remains constant.

A subject who is sufficiently *risk-averse* (in terms of the curvature of the utility function)[8] will opt for some redistribution also if his p_i is above the threshold. Allowing for *limited computing capacities* (for instance applying the Quantal Response model) we would expect t to decrease in p_i only gradually. Neither of these effects should be affected by the dispersion of others' probabilities.

Subjects displaying *outcome-based inequality aversion* will generally opt for even more redistribution, as transfers from the rich to the poor obviously decrease inequality. Assume the Fehr and Schmidt (1999) model[9]. If we denote individual incomes by y_i, y_j etc. and parameters of disadvantageous and advantageous inequity aversion by α and β respectively, the utility is given as:

$$U_i = y_i - \frac{\alpha}{n-1}\sum_{j\neq i}\max(y_j - y_i, 0) - \frac{\beta}{n-1}\sum_{j\neq i}\max(y_i - y_j, 0) \tag{2}$$

To apply the model to the problem at hand, first note that the difference between payoff of a winner and a loser is $V(1-t)$ and there are always exactly two players better off than i or two players worse off than i. It is then easy to compute the expected utility of player i and take the first derivative with respect to transfer t:

$$\begin{aligned} EU_i &= p_iV(1-t) + \frac{(1-\lambda)Vt}{2} - \frac{2}{3}p_i\beta V(1-t) - \frac{2}{3}(1-p_i)\alpha V(1-t) = \\ &= p_iV(1-t) + \frac{(1-\lambda)Vt}{2} - \frac{2}{3}V(1-t)(p_i\beta + (1-p_i)\alpha) \end{aligned}$$

Thus First Order Condition becomes:

$$\frac{\partial EU_i}{\partial t} = (-p_i + \frac{(1-\lambda)}{2})V + \frac{2}{3}V(p_i\beta + (1-p_i)\alpha). \tag{3}$$

Because $\alpha \geq \beta$, the marginal value of transfers decreases in p, similarly to the "selfish" benchmark. It can also be seen by putting $\alpha, \beta = 0$ as in the classical model, that inequity aversion increases support for redistribution. For sufficiently high parameter values, the individual will support full redistribution regardless of his probability of winning. For intermediate values of α and β, the "switching probability" will be between $\frac{(1-\lambda)}{2}$ and 1.

[8] A non-linear probability weighting function alone has limited impact on the predictions as distortion of probabilities is typically not very high in our "threshold" range of 0.35-0.5.

[9] Employing another inequality aversion, e.g. Bolton and Ockenfels (2000) would yield similar results, except for the fact that intermediate choices of transfers would generally obtain for high-PoW participants.

Specifically, assuming the values from Fehr and Schmidt, 1999 (Table III) we find that the median participant has $\alpha = 0.5$ and $\beta = 0.25$. Then solving for p_i

$$\frac{\partial EU_i}{\partial t} = (-p_i + \frac{(1-\lambda)}{2})V + \frac{2}{3}V(0.25p_i + 0.5(1-p_i)) = 0 \tag{4}$$

we find that when $\lambda = 0$, only for a PoW equal to 80 or 90 percent will the majority of participants opt for no redistribution, while for $\lambda = 0.3$ most participants with PoW equal to 60 percent will also do so.

Note that because utility is linear in transfers, each participant will either support full redistribution or no redistribution at all. This is a special feature of the Fehr-Schmidt formulation of inequity aversion. Again, the composition of the group has no effect on behavior (as long as the sum of all probabilities is held constant).

This is not the case under the *process Fehr-Schmidt model* considered by Trautmann (2006), which provides a simple way to allow for the "equality of opportunity" effect. The author assumes that individuals use expected rather than actual payoffs when judging the fairness of the distribution. Denote the expected payoff of player i by $E(y_i) = p_i V(1-t) + \frac{(1-\lambda)Vt}{2}$. Expected utility of player i is then given by:

$$EU_i = p_i V(1-t) + \frac{(1-\lambda)Vt}{2} - \frac{\alpha}{n-1}\sum_{j \neq i} \max(E(y_j) - E(y_i), 0) - \frac{\beta}{n-1}\sum_{j \neq i} \max(E(y_i) - E(y_j), 0)$$

This expression can be simplified by substituting:

$$E(y_j) - E(y_i) = V(1-t)(p_j - p_i) \tag{5}$$

which yields:

$$EU_i = p_i V(1-t) + \frac{(1-\lambda)Vt}{2} - \frac{1}{3}V(1-t)\sum_{j \neq i} |p_j - p_i|(1_{p_j > p_i}\alpha + 1_{p_j < p_i}\beta),$$

where 1_a is an indicator function taking value 1 when condition a is satisfied and 0 otherwise. Maximization with respect to t now yields:

$$\frac{\partial EU_i}{\partial t} = -p_i V + \frac{(1-\lambda)V}{2} + \frac{1}{3}V\sum_{j \neq i} |p_j - p_i|(1_{p_j > p_i}\alpha + 1_{p_j < p_i}\beta) \tag{6}$$

Again, due to linearity of the model, extreme values of t are predicted. This time however, the composition of the group affects the behavior. It is easy to see that a mean-preserving spread of others' probabilities increases the marginal utility of transfer.[10] This result corresponds to the general hypothesis discussed in the introduction, regarding the link between the dispersion of opportunities and support for redistribution. It is also quite intuitive. Consider an individual with $p_i = 0.5$ participating in groups with the following probabilities: $(0.1, 0.5, 0.5, 0.9)$ and $(0.5, 0.5, 0.5, 0.5)$. Even though financial incentives are identical for person i in either group, we would predict the choice of a higher t in group 1 (transfers are likely to go from the privileged person with $p_i = 0.9$ to the unfortunate person with $p_i = 0.1$), than in group 2, where initial probabilities seem fair. Generally, we can expect that (controlling for own probability of winning), greater dispersion of p_i's within a group will lead to greater transfers.

2.4.1 Deadweight loss

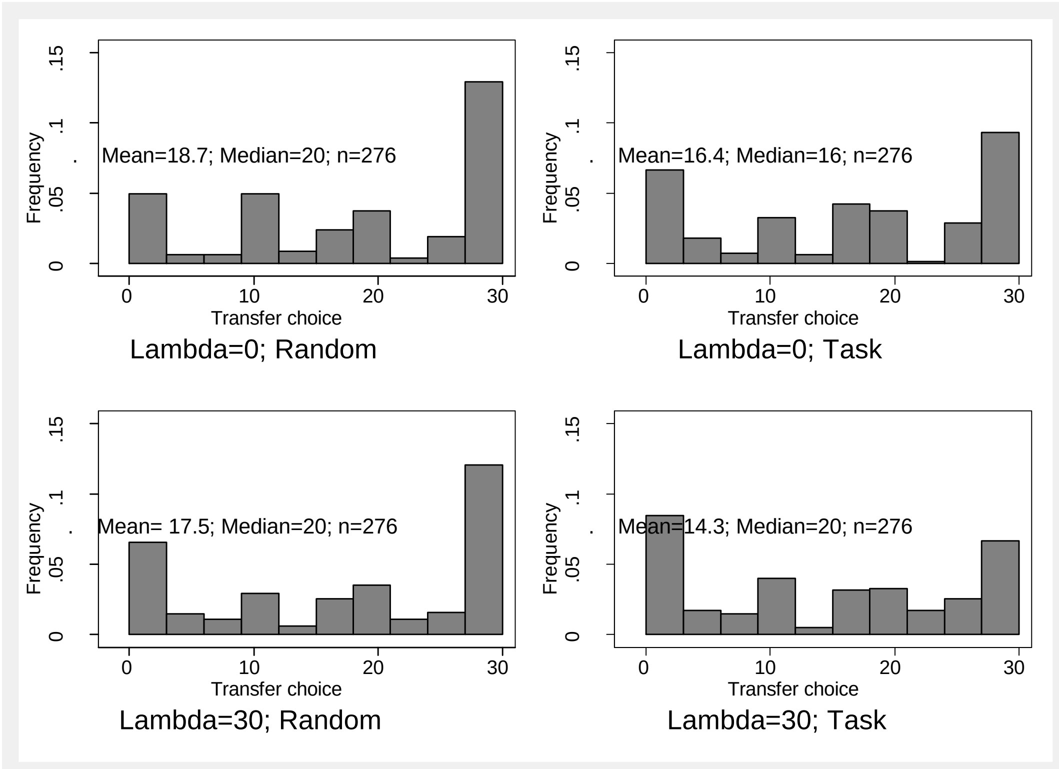
It is immediately obvious that by increasing the efficiency loss involved in the redistribution (represented by parameter λ), we diminish monetary incentives to opt for high transfer. Fairness concerns are not affected here, as the difference between subjects' incomes (or expected incomes) is independent of λ. However, efficiency-oriented individuals might find the reduction of total earnings unattractive. If participants are susceptible to self-serving bias, this concern might be more prevalent among the high-PoW subjects, as it delivers a good excuse not to support the more "fair" but individually irrational policy. If so, the impact of the increase in efficiency loss can be greatest in this group of participants.

2.4.2 Luck vs Skill

Incorporating the two treatments makes distinguishing different fairness motivations and perceptions possible. The question is what can serve as a basis for legitimate payoff differentiation. We speculate that superior performance in a task (presumably depending on skills and effort) may play this role, even though probabilities of success are still differentiated. If this is indeed the case, we should generally observe higher transfers in the Random Treatment than in the Task Treatment, as outcome inequality will be more justified in the latter case. This effect may be particularly strong for high-PoW subjects (self-serving bias). It is also possible that we observe a differentiated impact of the dispersion of probabilities. For example, subjects may feel that the difference in probabilities is less important if success is determined by pure luck anyway (see also Alesina and LaFerrara, 2001). In such a case the impact of inequality of opportunity will be stronger under Task Treatment. If both procedures create equal entitlements, that is, if subjects are exclusively concerned about the distribution of opportunities, no treatment effect will be observed.

Further, some participants in the Task treatment may feel that their chances are higher (lower) than PoW, because they expect to do better (worse) than a

[10] This is not a prediction of all "procedural fairness" models. For example, when the model develped in Krawczyk (2007), built on the model by Bolton and Ockenfels (2000), is applied, the dispersion of others' probabilities can be shown to be irrelevant.



typical subject. Optimistic subjects are then likely to chose lower transfers, while the opposite is true for the pessimistic subjects. Voluminous research shows that most people have a tendency to display some overconfidence most of the time (although the heterogeneity across tasks and individuals tends to be large, see Klayman et al., 1999 for a discussion).

3 Results

We first analyze individual transfer choices. Figure 3 presents frequencies and summary statistics of transfer choices made in the four conditions – in the Random and Task treatments and under high or low efficiency loss and Figure shows choices made in particular probability classes.

It is immediately clear from 1 that participants respond to the monetary incentives by choosing high transfers if their probability of winning is low and low transfers if their probability of winning is high. There is also a great deal of heterogeneity, with only low-PoWs predominantly choosing very high transfers

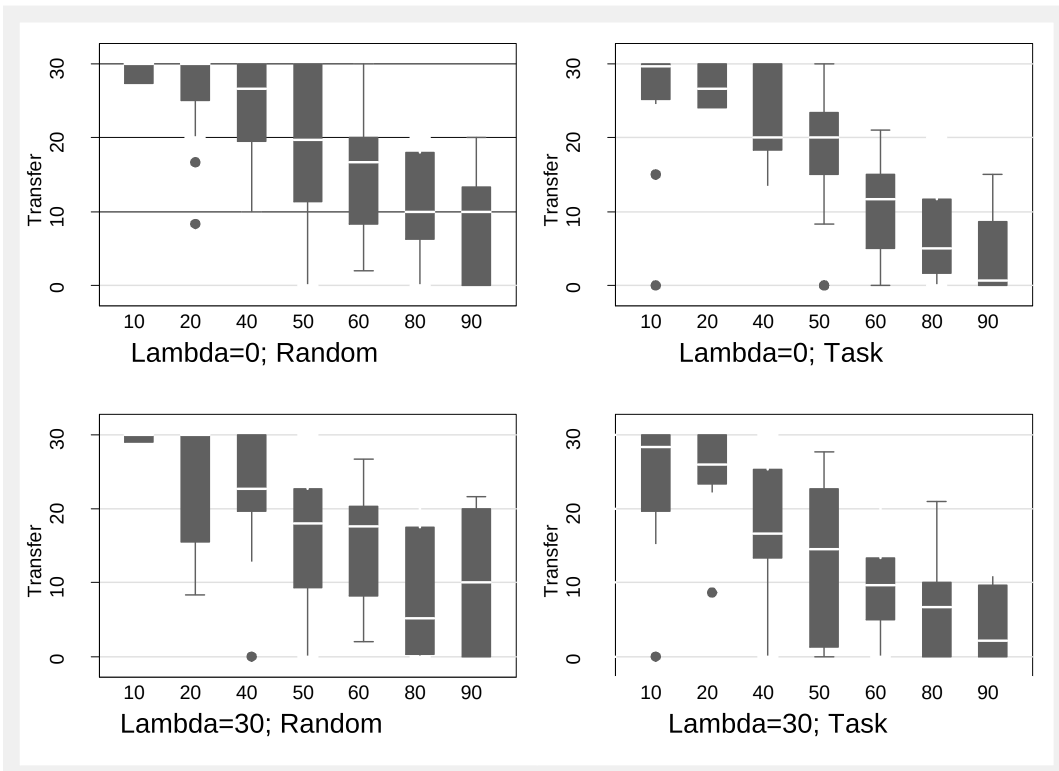


Figure 1: Box-plots of mean transfers, by λ for Task and Random.

[11] However, individual transfer choices display internal consistency – in the cases where two choices were made in the same circumstances (same group type and same value of λ), the second choice was identical with the first 63 percent of the time and differed by at most 5 euro 85 percent of the time.

Averaging over the three decisions made by each subject under fixed efficiency loss and comparing matched pairs, we find that transfer choices were significantly lower for positive deadweight loss ($p < 0.01$, one-sided sign test). Interestingly, looking across probability classes, we find that only participants with PoW of 40 or 50 percent, so those whose expected-value maximizing choice was altered by the introduction of the efficiency loss, actually reacted to it. It suggests that efficiency concern was not a strong motivator in this task. Looking at the average value of the Group Account (net of efficiency losses) resulting from proposed transfer levels, we observe a substantial decrease from 35.0 to 22.3, most of which, however, results directly from the application of the efficiency loss. These findings are consistent with theoretical predictions that an increase in deadweight loss leads to a smaller government (see Becker and Mulligan, 2003 and Crutzen and Sahuget, 2007).

Task vs random Entries in Figure 3 show that transfers are generally lower in the task condition. A formal test confirms this conjecture at $p = 0.065$ (MWW; whereas $p = 0.028$ in a t-test). Similar results are obtained if means for high and low λ are computed separately, the difference between transfers under "Task" and "Random" being somewhat more pronounced under positive deadweight loss ($p = 0.05$ for high λ, n.s. for the low λ; whereas $p = 0.019$, $p = 0.065$, for the high λ and low λ respectively when t-test is used instead). The treatment effect is particularly driven by female participants, who redistribute much more than males, but only in the Random condition (21.8 vs 15.5 euro).

Looking across probability groups, we see that the transfers in the Task treatment are always lower, although generally, due to smaller sample sizes, not significantly so. We also note that the treatment effect is somewhat weaker in the lowest probability groups: 2.1 euro for $PoW < .3$, 2.7 euros for $.3 < PoW < .7$ and 3.6 euros for $PoW > .7$ – which however could be explained by the fact that transfers under Task treatment are already very high in the low probability groups. What is interesting, in the Random treatment a majority of low-PoW participants (56 percent) consistently chooses maximal transfers, whereas many others choices are roughly equally spaced between 10 and 30 (suggesting some randomness in the choice). In the Task treatment, only 35 percent always chooses transfers of 30, whereas another 48 percent choose high-but-not-maximum transfers (average between 20 and 30), as if they thought it fair for the winners in the task to earn somewhat more than the losers.

As mentioned in the previous section, two potential reasons for the observed treatment effect suggest themselves. First, it is possible that participants in the Task treatment overestimated their chances of success, thus adjusting transfer

[11] These participants, particularly those with PoW equal to 10 percent also took least time to make their decisions.

choice downwards.[12] To verify this possibility we asked the participants what their subjective belief about the probability of winning was (explaining that it should be higher (lower) than their PoW if they expected to do better (worse) than a typical student would). The results showed slight overconfidence: average subjective anticipated probability of winning was 55.8%, while average probability was equal to 50% by design.[13] We also asked (before the assessment of own subjective probability) whether they took into account, while making choices, their expectation to perform better or worse than a typical student would. Again, average entries for the question about superior performance where somewhat higher than for the question about inferior performance (4.45 vs 3.48 on a 7-point scale, a significant difference).[14]

To sum up, we do observe some overconfidence. It appears, however, that it cannot account for the observed difference in transfers between Task and Random treatments. First, we have seen that this difference is actually greatest for high PoW (i.e. when there is least room for being overconfident). More importantly, when included in a regression model, the two questions about expected performance in the task do not significantly affect transfers. The subjective probability of winning is not significant either when the assigned probability is controlled for. Actually, even if the *assigned* probability of winning was 5.8 percentage points higher in the Task treatment, the value of the coefficient obtained in a regression suggests that level of transfer could increase by about 1.3, rather than 2.8 euro. It is thus likely that overconfidence plays some role in the behavior under Task treatment, but it is most probably not the main force behind the observed difference.[15]

The second possibility is that unequal allocation following low transfers was considered more acceptable when it resulted from a task, which required, as stated in the instructions, "some effort, some skill and some good decisions". Indeed, there is a huge experimental literature confirming that earned income

[12] Robin Cubitt has pointed it out to me that participants could have displayed a differentiated attitude towards Task vs Random due to ambiguity aversion – while Probability of Winning clearly determines the chances under Random, it only gives a more or less vague clue under Task. This effect should make the subjects favor relatively higher transfers (thus reduced uncertainty) in the latter treatment. The observed treatment effect can be thus thought of as a lower bound on the impact of the other forces considered.

[13] While overall subjects were somewhat overconfident, high-PoW participants generally underrated their chance of success (the coefficient in the regression of subjective PoW on the assigned PoW was just .41). It is interesting to see whether this de-polarization of perceived probabilities of winning could lead to lower (or higher) transfer choices. Comparing transfers across broad probability classes, we find that the middle class (PoW between 40 and 60 percent) in the Task treatment on average chose transfers of 15.5 euros, compared to the overall average of 15.3 euros (the respective values were 18.5 and 18.1 in the Random treatment). I thus claim that this convergence toward intermediate perceived probability of winning could not significantly affect the transfer choice.

[14] Regrettably, these two questions were presented always in the same order (better-worse), possibly inflating the difference.

[15] We also note that the subjectively perceived PoW was not correlated with the score in the task, not even in the sessions in which the nature of the task was revealed before the decisions. It is thus not the case that (many) participants correctly recognized their superior ability, upon which redistribution decisions could be based.

is more legitimate than randomly assigned income. In the current experiment, participants reported having substantially higher influence on the earnings in the experiment under Task treatment ($p < 0.01$ in a Mann-Whitney-Wilcoxon test). Those in the Random treatment, on the other hand, scored higher on the question "It was important to me to equalize everyone's earnings" and lower on "I think the differences assigned probabilities are irrelevant. Everyone has earned his money by participating". We also asked about perceived fairness of the procedure used to identify "winners" and "losers" (see Lind and Tyler, 1992). No significant difference was observed. However, repeated questions from the participants suggested that there could have been substantial confusion about its precise meaning. Moreover, the between-subject design resulted in lack of a clear benchmark for comparison.

Finally, regression analysis shows that the estimated value of the coefficient on treatment decreases when responses to questions pertaining to the fairness judgments are introduced into the regression, providing additional indication that part of the difference can be explained by differentiated justification of the unequal allocation (in other words, the treatment effect is partly mediated by the fairness perception). Further, it shows that clear impact of inequality aversion can be found for high-probability participants under Random but not under Task treatment. It appears thus that the enhanced legitimacy of the unequal allocation contributed to lower transfer choices under Task treatment.

Effect of dispersion of chances As mentioned before, dispersion of probabilities of winning took two levels within each 3-period block with specific value of λ. We can thus, separately for λ equal to 0 and λ equal to 30 percent, compare for each participant the mean transfer selected under high dispersion with mean transfer selected under low dispersion (there is always one entry for one these two categories and 2 entries for the other). Running a sign test we find no significant difference: under λ equal to 0 transfer choices are slightly higher when dispersion is high ($p = 0.33$), whereas they are not different at all under λ equal to 30 percent ($p = 0.58$). When probability classes are considered separately (or pooled into three groups to increase sample size), test results never approach significance either. The same conclusion obtains if Task and Random treatments are considered separately. Interestingly though, the *difference* between the treatments approaches significance in a one-sided test (t=-1.18, p=0.12): in line with Alesina and LaFerrara (2001) the dispersion of opportunities impacts redistribution choices more positively when the process might be deemed as fair. That is, the mean difference between choices in high-dispersion groups and choices in low-dispersion groups is higher under Task treatment than under Random treatment (.58 vs $-.46$). This difference is particularly pronounced for low efficiency loss ($t = -1.63$, $p = .05$).

Considering the distribution of the difference between mean choice in high dispersion groups and low dispersion groups we find that it is equal to 0 for about 45-50 percent of participants. This large proportion of zeros suggests a possibility that some subjects considered conditioning the choice of transfer on the group composition as "irrational" and thus tried to choose consistently. If this was the case, each participant's first-period choice would reveal her "true" preference, while subsequent choices would merely be its replications. We therefore tested, in a between-subject manner, the effect of dispersion of probabilities on transfers in the first period only. The transfers were actually slightly higher if dispersion of probabilities was low but not significantly so ($p = 0.17$ Mann-Whitney-Wilcoxon).

We also checked for the possibility that the hypothesized effect only appears in subjects who took sufficient time to think about particular group composition. No relationship between the total thinking time and the difference between transfer choices in high- and low-dispersion groups was found. Interestingly however, even though we found no systematic impact of dispersion on behavior, it did affect the decision time – subjects significantly took more time to choose in the high-dispersion groups.

A regression analysis also confirms that standard deviation of within-group probabilities is not a significant predictor of the level of transfers. We can thus conclude with confidence that dispersion of chances does not make our participants opt for greater redistribution, as long as their individual probability of winning remains unchanged.

Analysis of the responses to the open-end question about the strategy employed by the subjects suggests one reason of this negative result. It indicates that some of them might have, intuitively but incorrectly, perceived their own chances as higher when the dispersion of PoWs was high. Two quotations representative of this tendency are reported here: "I had a 60% chance of winning, so in groups of 40, 40, 60, 60 probabilities I acted as a loser, i.e. chose 30 (...) In groups of 20, 40, 60, 80 probabilities I saw myself more likely a winner, so chose a lower transfer"; "When I was the only high probability I would pick lower transfers, and when another 0.8 was with me I would pick a little higher in case I lost. After the fact [I realized that] I probably should have always picked low numbers regardless since there are always 2 winners and I suppose statistically I should win every time."

4 Discussion

In recent years the issue of support for redistribution appears to attract some attention of experimentalists. Two studies which are perhaps most closely related to mine are by Hörisch (2007) and Durante and Putterman (2007). The former elegantly confirms the intuitive notion that choice from behind the veil of ignorance is driven by social concerns, not only risk aversion (but mostly so for the female participants). The latter, more comprehensive study, also finds that redistribution choices are governed by inequality and risk aversion and additionally illustrates that people are affected by the way in which outcomes are determined (transfers being higher when allocation of (pre-tax) income is random or based on the income of the place of origin, rather on performance in a task (a game of Tetris or a SAT-like quiz)). This effect can be ascribed to apparently greater legitimacy of earnings in the latter case. Both studies also find that female participants tend to redistribute more.

The current study is, to our knowledge, the first which experimentally tests the impact of differentiated opportunities on preference for redistribution. We verified two aspects of the hypothesis that inequality of opportunity calls for a compensation by ex-post redistribution. The notion that greater dispersion of chances leads to increased support for welfare state finds no support in the collected data. This negative result might to some extent be driven by the fact that, strange as it might be, some participants perceived their own chance as greater (and thus did not want to share) when the dispersion of chances increased. Another potential reason is that participants failed to notice the changes in groupmates' probabilities of winning or were not able to take this bit of information into account in a relatively difficult decision making task. However, the distribution of PoWs was actually the only thing that changed between the rounds, its variation thus being made salient. Further, the increased response time in the cases of greater dispersion of chances suggests that subjects did notice a difference and made some cognitive effort to choose the best response. Finally, the result could be driven by the fact that chances to decide were distributed equally, thus making the un-equal distribution of chances to win less important. However, participants very clearly reacted to their own Probability of Winning; further, in responses to the open-end question, consideration of what other might do if they have a choice was basically never mentioned.

Whatever the exact reason of this null result is, it gives a hint regarding the right way to model preference for equality of opportunity. Namely, it suggests that individuals focus predominantly on their own chance, largely disregarding the dispersion of others' chances. It thus speaks for the models of "self-centered" preferences. Of course, with the scarce evidence at hand, it would be very unwise to immediately discard other models.

What regards the second focal dimension studied in our experiment, we observe higher redistribution choices when the income is determined randomly rather than by performance in a task (and it cannot be reduced to the effect of overconfidence). This finding corroborates suggestions made in field studies and some very recent experimental evidence (such as the above-mentioned by Durante and Putterman, 2007). The context is somewhat different, however, in that in the current study the chances of succeeding in the task are exogenously controlled (and differentiated) between the subjects. In other words the two aspects of equality of opportunity are manipulated in an independent way.

Preliminary as they may be, these findings suggest two policy implications. First, that the perceived equality of opportunity is an important factor affecting the demand for government's assistance. Taxing bequests, equalizing access to quality schooling, fighting nepotism or racial and gender discrimination may not only make the society more fair and open positions to talents but also eventually lighten the tax burden by facilitating acceptance of income differences. Second, that social mobility per se might not be as important as the feeling that the professional and financial success is primarily based on merit.

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