Expectations and Social Influence
Dynamics in Economics

ExSIDE

ExSIDE Working Paper Series

No. 27-2020
June 2020

The Inequality Trap: How High Stakes Fuel Overestimation and Equality Aversion

Michele Bernasconi
Frieder Neunhoeffer

www.exside-itn.eu

Marie Sklodowska-Curie Innovative Training Network "Expectations and Social Influence Dynamics in Economics (ExSIDE)"
This project has received funding from the European Union Horizon 2020 Research and Innovation action under grant agreement No 721846.

The Inequality Trap: How High Stakes Fuel Overestimation and Equality Aversion*

Experimental evidence on preferences for redistribution

Michele Bernasconi† Frieder Neunhoeffer†‡

June 16, 2020

Abstract

Bringing existing inequality in South Africa (high) and Switzerland (low) to the lab, we study how people's preferences for redistribution change with the level of income inequality, income mobility, uncertainty of initial income positions, source of income (random or based on real-effort). We find that uncertainty and overconfidence undermine demand for redistribution. The effect magnifies with larger income disparity (South Africa). It further induces a *reverse POUM effect*: since wealth ambitions of rich aspirants are better preserved under low than under high mobility, demand for redistribution grows in the degree of mobility. These results combined propose an *inequality trap*: today's inequality favors income overestimation, winding up less demand for redistribution with less mobility, which propels advanced inequality tomorrow.

Keywords: Overconfidence, income inequity, social mobility, uncertainty.
JEL Classification: D31, D63, D84

*We want to thank Luca Corazzini, Tiziana Medda, and Andrea Albarea for stimulating discussions and their support during experimental sessions. Special thanks go to Antonio Filippin and Daniele Checchi for sharing experimental programs. The paper benefited from many useful comments of participants at the 2018 SIEP conference in Padova and the 2019 SPUDM conference in Amsterdam. This work has received funding from the European Union Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No. 721846, "Expectations and Social Influence Dynamics in Economics" (ExSIDE).

†Ca' Foscari University of Venice, corresponding author: *frieder.neunhoeffer@unive.it*
‡University of Amsterdam

1 Introduction

Democracy enables the people to chose public policies through the ballot. It is therefore remarkable that, although income inequality has grown worldwide since the 1980's, demand for redistribution has declined continuously over the same period (Atkinson, 2015; Stiglitz, 2016).[1]

Motivated by the public relevance of socio-economic issues caused by spreading inequality,[2] a growing body of literature has returned in recent years to investigate a familiar paradox of western democracies known as the puzzle of "the poor who do not expropriate the rich" (Roemer, 1998): why does a substantial share of poor individuals shows little support for redistributive policies and even votes for regressive tax cuts although this widens the rich-poor income gap and exacerbates the hardships they experience due to inequality?

We contribute to this literature strand with an experimental study on central economic characteristics of a society that favor income inequality. Compared to empirical investigation which suffers from confounding influences to varying degrees, a controlled lab environment facilitates isolated analysis of economic drivers. By testing fresh leads from empirical data a number of insightful experiments have recently accrued to the field with this purpose.[3]

Durante et al. (2014) adopts a real-world framing highlighting different fea-

[1] In Western Europe, one of the world regions with the lowest structural change, the ratio between the income shares of the top 10% richest people to the bottom 50% has increased by 26% over the period 1980-2016. In the US the changes have been more massive and the ratio has even doubled. In a global perspective the top 1% richest individuals captured twice as much of the world income growth over the period as the bottom 50% (Alvaredo et al., 2018). Despite these large inequality shifts, the top marginal income tax rates have been drastically reduced (from on average 70% to 42 % in the major world economies), with redistribution achieved by the tax-benefit systems also falling (Piketty, 2014; Atkinson, 2015).

[2] Economic inequality causes problems for well-being, social cohesion, health, access to education, public order, mortality (Wilkinson and Pickett, 2017). At the time of writing this paper, the explosion of healthcare needs and the fear of an economic recession to come have made the inequitable response to the COVID-19 pandemic already evident (Ahmed et al., 2020). Moreover, the large media attention around the social unrests across major US cities in the aftermath of the death of George Floyd have raised awareness for negative implications of social inequality and sparked a public debate.

[3] Lab experiments in the field include studies by Bernasconi (2002); Tyran and Sausgruber (2006); Konrad and Morath (2010); Erkal et al. (2011); Esarey et al. (2012); Großer and Reuben (2013); Agranov and Palfrey (2015); Amiel et al. (2015); Fang et al. (2016); Ryvkin and Semykina (2017); Paetzel et al. (2018); Jimenez Jimenez et al. (2019); Sausgruber et al. (2019), the articles quoted in the book by Gaertner and Schokkaert (2012), and other references below.

tures of the macroeconomy. In our view, their study sets a first benchmark to measure people's preferences for redistribution in the lab which could resemble those in the field. The experiment finds that a mix of classical motives concur to determine people's support for redistributive policies. These include maximization of expected earnings, demand for self-insurance against future income shocks, and social concern for inequality and efficiency.

We conduct a follow-up study to focus on related issues beyond the scope covered by Durante et al. (2014). This includes the role of pre-tax inequality on people's demand for redistribution and its interaction with social mobility. Pre-tax inequality can impact redistributive demand in many ways, with distortionary costs of taxation representing merely one of them. Other reasons include perceived fairness of income differences and, from here, the legitimacy of the redistribution process, as well as the effect that pre-tax inequality can exert on people's expectations about their prospects in life. Regarding the latter, much work has documented a human tendency of holding overoptimistic beliefs (Moore and Healy, 2008). This overconfidence, moreover, differs from the rational prospect of upwards mobility (POUM hypothesis) that people with an income below average (the poor) can have to move up the income ladder when actual mobility is sufficiently high (Benabou and Ok, 2001). Though different from rational expectations, overconfidence can interact with true mobility.

Inducing distinct degrees of inequality, our experiment replicates real-world conditions in South Africa, home of the highest national pre-tax inequality, and conditions in Switzerland, representing the worldwide lowest pre-tax inequality. Whereas in Phase 1 of the experiment subjects knew the income distribution but not their individual position, in Phase 2 subjects learned about their income position which was either randomly assigned to them or based on an effort task. Varying income determination and adding a dynamical framework (income mobility) to the treatment set we employ altogether a 4x4 design. This consists of two within-subject variables (uncertainty vs. certainty of income class, low vs. high income mobility) and two between-subject variables (low vs. high pre-tax inequality, random vs. effort-based income assignment).

We predicted that uncertainty about initial income positions arouses overconfidence which is confirmed by the data. Overconfidence intensifies with the level of pre-tax inequality. This also induces a reverse POUM effect: since

uncertainty of initial income positions preserves wealth ambitions of rich aspirants better under low than under high mobility, demand for redistribution is lower under the former than under the latter condition. Lifting uncertainty of initial incomes draws an articulated picture: while demand for redistribution increases, the distributional conflict between rich and poor also emerges more polarized and particularly so in case of high inequality. The results combined suggest that reducing pre-tax inequality and raising awareness of people's own economic position can represent two measures to invert an inequality trap: inequality facilitates income overestimation, depressing demand for redistribution given low mobility, with the consequence of increasing inequality.

The remainder of the paper is structured as follows. The next section reviews related literature on preferences for redistribution. In Section 3 we describe the data set, the experimental procedure, and the design. Section 4 contains a descriptive and econometric analysis of the results. The last section concludes with a discussion of the findings, policy implications, and directions for future research. Additional material is in the appendix.

2 Literature insights

A large literature has investigated people's redistributive demand. Below we review the main insights relevant for our experiment. We start with the paradigm of rational preferences and how it deals with the effect of income uncertainty.

2.1 Rational preferences: redistribution and income uncertainty

The workhouse to analyse redistributive policies, the median voter theorem (Downs, 1957; Meltzer and Richard, 1981), assumes that people know with certainty their income position. Under the hypothesis of the classic *homo oeconomicus*, it predicts that the below-mean income majority (poor) support redistribution whereas the above-mean minority (rich) oppose it. The actual amount of redistribution resulting from voting decisions depends on various conditions. It is nevertheless widely agreed that the theorem predicts more redistribution than what is generally observed (Alesina and Giuliano, 2011).

Among the frequently debated ideas for why tax rates deviate from the median voter theorem here we focus on the role of uncertainty of the relative in-

come.[4] It becomes evident considering that today's voting decision affect an individual's earnings tomorrow when redistributive policies are persistent. In this case individual expectations about future income positions come to the fore. The rational preferences approach considers two effects.

2.1.1 Risk aversion

A classical argument is related to risk aversion. It implies that also the rich welcome redistribution as a form of self-insurance against future income shocks and that its demand increases in uncertainty (Sinn, 1996). Examining the effect of an insurance motive in real world data can be difficult due to several confounding effects, including multiplicities of equilibria when other insurance opportunities are available from the private sector (Benabou, 2000). Yet, various experiments have confirmed the impact of income uncertainty to generate demand for redistribution under different set-ups (e.g. Cowell and Schokkaert, 2001; Schildberg-Hörisch, 2010; Höchtl et al., 2012; Durante et al., 2014).

2.1.2 Prospects of mobility

Preferences for redistribution can also depend on agents' expectations to ascend or descend the income ladder. Benabou and Ok (2001) introduced the prospect-of-upward-mobility (POUM) hypothesis. Assuming a concave transition function, limited risk aversion, and some duration of the implemented tax scheme, the theorem proves that a rational median income earner votes for limited redistribution today as she expects an above-mean income in the future. The impact of mobility prospects has been studied with survey data (e.g. Alesina and La Ferrara, 2005; Bernasconi, 2006; Cojocaru, 2014; Laméris et al., 2020). While studies often find that preferences for redistribution decrease with greater mobility, the relation between perceived and actual mobility is often weak (Swan et al., 2017; Alesina et al., 2018; Cheng and Wen, 2019, and below). Studies are therefore generally inconclusive for the POUM hypothesis.

Few experiments have tested the POUM in the lab. Checchi and Filippin (2004) find decreasing average tax rates as income mobility and the length

[4]Several critics note that the median voter model is too naive for reality as democratic institutions work less than perfect for various reasons (Harms and Zink, 2003), including the impact that money can have to alter the democratic game through various channels (Bartels, 2018).

of the implemented tax scheme rise. Agranov and Palfrey (2020) develop a dynamic model of redistributive taxation which casts the POUM in a Meltzer-Richard set-up. Based on the latter model they calibrate an experiment and find several results including that preferred tax rates fall with increasing mobility. The degree of mobility on inequality is instead not significant. Both studies, though not fully comparable, bear theory-driven experiments validating the intuition of the POUM hypothesis regarding a dynamic trade-off between actual levels of inequality and mobility. Neither experiment addresses the question of the impact that personal beliefs and perceptions can have on this trade-off.

2.2 Social preferences, merit, luck

In addition to self-interest economists have long been aware that people hold preferences for what they perceive as socially just. Initially they have considered social preferences mainly from a normative perspective, reflecting an impartial position (Harsanyi, 1955; Rawls, 1971). From a more practical perspective personal interest and social concern are likely to determine jointly attitudes towards economic divisions including income distributions (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Charness and Rabin, 2002).

Many models of social preferences underlies the close connection between the notions of risk aversion and inequality aversion (Atkinson, 1970). At least for the latter it strictly implies, ceteris paribus the greater is inequality the higher the demand for redistribution. Moreover, according to the same argument, when redistribution is not costly, the level of pre-tax inequality should not affect preferences for post-tax inequality.

The caveat 'ceteris paribus', however, can be very important from a positive perspective. Much work has affirmed how people's culture, history, or traits can affect beliefs about justice and fairness, thus redistributive policy decisions (Piketty, 1995; Alesina and Angeletos, 2005; Benabou and Tirole, 2006).[5]

One conjecture that has attracted attention based on evidence from social

[5]Roemer (1998) has shown that sociological traits (e.g race, religion, ethnicity) can affect demand for redistributions also when they represent politically relevant secondary divides used by low-tax parties to distract a fraction of the poor to vote for high redistribution (for recent evidence see Corneo and Neher, 2015). While experiments can control for secondary channels, e.g. by using homogeneous samples like university students, results of experiments can still be influenced by cultural and sociological factors when they affect moral values globally.

surveys argues that people are willing to accept more inequality when income is obtained by effort/merit instead of pure luck (Fong, 2001; Luttmer and Singhal, 2011; Cojocaru, 2014). Experiments have found some support for this hypothesis, but the evidence is not overwhelming (Krawczyk, 2010; Jiménez-Jiménez et al., 2018; Ku and Salmon, 2013; Lefgren et al., 2016; Balafoutas et al., 2013; Gee et al., 2017; Kesternich et al., 2018). For example, Durante et al. (2014) find more demand for redistribution when luck decides over income positions rather than effort. Yet, the difference occurs only before individuals learn their income position, but disappears when preferences are stated knowing the own income position. They relate the effect to people's overconfidence about their ability in the effort task.

More generally, Cappelen et al. (2007, 2013) confirm that people hold different views on fairness, including egalitarian fairness (no form of income difference is justifiable), libertarian fairness (any form is perceived as acceptable), and meritocratic fairness (only inequality arising from merit, not luck, is acceptable). Luck alone can also be viewed as a form of fairness under certain conditions, for example when goods are not divisible (Diamond et al., 1967; Sen, 1970; Broome, 1984).[6] Moreover, it can be regarded as necessary to prevent a society from drifting towards too rigid structures bearing negative socio-economic externalities (Young, 1958; Arrow et al., 2000).

2.3 Behavioural approaches

Explaining limited redistribution by misperceiving wealth differences has received growing attention in the academic debate on inequality. Misperception can affect both, how people evaluate their current situation and the way they look into the future.

2.3.1 Misperception of social inequality and mobility

Studies focussed on current income/wealth generally find large discrepancies between underestimated and existing inequality (Hauser and Norton, 2017; Norton and Ariely, 2011; Karadja et al., 2017; Cruces et al., 2013; Ashok et al.,

[6] A recent experiment by Charité et al. (2015) has found that even employed as external observer people refrain from redistributing from rich to poor to respect others initial endowments and prevent them experiencing loss-aversion.

2015). They observe general preference for even less inequality than the already underestimated levels.

Few studies have analysed the relationships between people's expectations of future income positions based on perceived versus actual mobility (Kraus and Tan, 2015; Davidai and Gilovich, 2015). The suggestive evidence is mixed. In line with the idea of the "American Dream", Alesina et al. (2018) finds that Americans' beliefs about mobility are more optimistic than Europeans' and that while the former are also over-optimistic with respect to the level of actual mobility, the latter tend to be over-pessimistic. Other studies find contrasting evidence and argue that American's beliefs of social mobility are instead pessimistic (Swan et al., 2017; Cheng and Wen, 2019).[7]

2.3.2 Overconfidence

A different form of misperception that can affect expectations is overconfidence. Overconfidence is a broad term used in behavioural sciences to describe a tendency of individuals thinking in they are better in doing something than they actually are (Moore and Healy, 2008). Various explanations can underlie overconfidence, including cognitive errors, self-motivated beliefs, self-esteem, or social contexts (Logg et al., 2018; Köszegi, 2006; Schwardmann and Van der Weele, 2019). Forms of overconfidence specifically relevant in economics occur not only when people overestimate their absolute abilities but also when they believe their abilities are better than other people's. Both forms of overconfidence have been reported by a large literature (DellaVigna, 2009). The latter is sometimes also referred to as overplacement or 'better-than-average' bias.[8]

[7]Most existing studies focus on intergenerational rather than intragenerational mobility. Cheng and Wen (2019) also remind that a difficulty to reconcile different results can arouse from the multi-faceted nature of income mobility, with transition probability matrices that cannot be easily consigned to a unique measure (Fields and Ok, 1999; Jäntti and Jenkins, 2015).

[8]According to Logg et al. (2018), better-than-average bias ought to apply to cases where the majority of people claim they are better than the median; while overplacement refers to situations in which a person thinks to obtain a higher ranking on a task test than she actually does. More generally, it should be noted that parallel to the diversity of definitions, the literature maintains a variety of approaches to estimate overconfidence. Benoît et al. (2015) have also shown that in some cases beliefs and behaviours apparently consistent with overconfidence can be due to a population of rational Bayesians with incomplete information regarding their abilities. Recent evidence by Benoît et al. (2015) has nevertheless shown that true overconfidence is also robust to such Bayesian critique (see also Cheung and Johnstone, 2017).

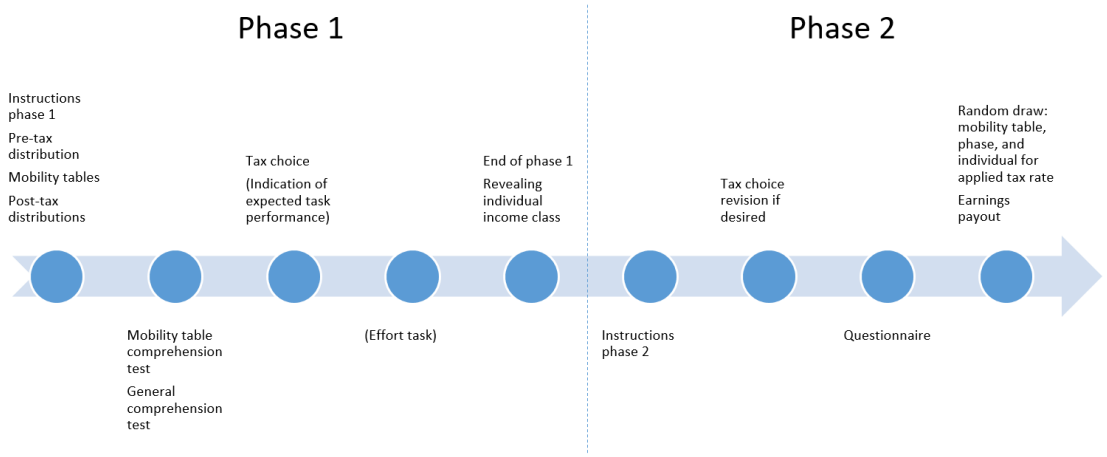
Overconfidence can also be related to other forms of optimistic beliefs, such as people's tendency to over-estimate preferred outcomes (Brunnermeier and Parker, 2005; Heger and Papageorge, 2018). It can respond to social stereotyping and exhibit gender effects with men displaying some higher overconfidence especially in competitive tasks (Charness et al., 2018; Bordalo et al., 2019).

We are interested into two possible implications of overconfidence in the context of redistributive preferences. Firstly, it might be plausible considering that greater pre-tax inequality boosts overplacement of the income position. In a world where incomes are close to each other there is little reason for overestimation. The larger is the median-mean income gap in a society, the greater is the motivation for being overconfident.

Secondly, we suggest that overconfidence can weaken or even reverse the POUM hypothesis. The standard POUM framework assumes certainty about individuals's current income positions. We invite the reader to think of a state in which there is uncertainty about people's current positions. In such a case, if people believe to be better than others and deserve being rewarded for this, they will prefer economic positions invariably awarded on merit. In other words, they will prefer a society to be rather rigid in determining social ranking as too much mobility could be viewed as harmful to their economic ambitions. In fact, based on this line of reasoning, one could conjecture that overconfident individuals are particularly against redistribution under low mobility, while they may be more neutral or even supportive of some redistribution under high mobility. We refer to this hypothesis as the reverse POUM effect.

3 The experiment

We run a laboratory experiment to study people's preference for redistribution. The experiment was run in the CERME lab at Ca' Foscari University in April 2018 using z-Tree (Fischbacher, 2007). A total of 160 college students (mainly from the economics faculty), were recruited and assigned randomly via ORSEE (Greiner, 2015) to one of eight sessions with 20 participants each. The sample averages 21 years and is fairly gender-balanced (55% males).



Steps in brackets were only included in the effort condition.

Figure 1: Experimental flow

3.1 Experimental procedure

The procedure of our experiment is similar to that by Durante et al. (2014), in which subjects are asked to state their preferences for redistribution under different conditions, both within- and between-subjects. While the procedure is similar, the focus is different featuring distinct experimental treatments. First we describe the procedure and then the treatments.

Fig. 1 illustrates the flow of a typical session which lasted an hour and 15 minutes and was divided in two phases, Phase 1 and Phase 2. Each of the two phases asked participants to choose two tax rates for redistributive transfers (hence, four tax rates in total), that could affect their own and the payoffs of the other participants. In addition each participant received a show-up fee of 5 €.

Phase 1

At the beginning of each session the experimenters handed out instructions for Phase 1 and read them aloud to subjects. The instructions mentioned a division in two phases together with the fact that only one of the phases, randomly chosen, would count for payment. Yet, the content of Phase 2 was not further specified until its very start.[9]

[9]The instructions for the two phases are in Appendix A.

Pre-tax income distribution

From the instructions of Phase 1 participants learned that they and the other 19 participants formed a society with a specific pre-tax income distribution consisting of five income classes X_i, with i = 1,2,...,5 and four subjects per class. They were further educated that the income distribution represented one of the world's top 40 national economies scaled down to an average income $\overline{X}$ = 10 €, but not which country. The actual country's income distribution varies among two between-subjects treatments. Importantly, whereas the instructions informed subjects of the pre-tax income distributions, subjects own income assignment remained unknown to them until the end of Phase 1. Subjects only knew the assignment mechanism of income positions, which could either be random or based on an ability task in two further between-subjects treatments.

Mobility process

The instructions further informed participants that the pre-tax income distribution would last for two periods. The payoffs received by each subject at the end of the experiment would be determined by a tax rate chosen at random among all tax rates indicated by participants and applied to the second period pre-tax income distribution. Subjects learned that whereas the income levels remained constant between periods, initial incomes' assignments could change between periods according to a specific mobility process. Phase 1 presented subjects two income mobility tables and asked them to indicate their preferred tax rates, one for each mobility process. If Phase 1 was also selected for payment, one of the two mobility processes would be chosen randomly and used to determine the last period pre-tax distribution to which the selected tax rate was applied.

Taxation

The last piece of information given in Phase 1 concerned the tax and transfers system used to determine the post-tax income distribution. The experiment applied a standard formula to tax incomes, based on full and equal redistribution of collected tax revenues among all income classes, namely:

$$Y_j = X_j - \tau X_j + \frac{1}{20}\tau \sum_{k=1}^{20} X_k = (1-\tau)X_j + \tau\overline{X} \tag{1}$$

where X_j is a subject's pre-tax income class after transitioning, τ the applied tax rate, and Y_j her post-tax income counting for payment. Albeit the instructions did not show the formula (only presented in an appendix for control), they included post-tax distributions generated by applying tax rates, ranging from 0% to 100% in increments of 10%, on the pre-tax distribution (see Tab. 2 below).

Before indicating their preferred tax rates for the two mobility tables, subjects had to pass two comprehension tests to ensure their understanding of the experiment. One test was directed at the mobility treatment, the other guaranteed participants' comprehension of the overall procedure. Subjects could not advance to the main experiment until both tests were correctly answered.

Upon successful completion, subjects expressed their preferred tax rates not knowing their initial pre-tax incomes. As indicated, the latter were only disclosed after submission of tax choices at the end of Phase 1 (in the effort treatment also after subjects had performed an ability test described below).

Phase 2

After uncovering initial pre-tax incomes, the computer program informed subjects about the beginning of Phase 2. Ultimately knowing their initial income position they were asked again for their preferred tax rate in association with the two mobility tables. Whether experimental earnings were based on Phase 1 or 2 was randomly determined at the end of the experiment together with the random selection of one mobility table and the corresponding tax rate of one participant. Before receiving payments in cash, subjects completed a questionnaire including demographic information.

3.2 Experimental variations within- and between-subjects

The above procedure was used to implement four different experimental variations, two between-subjects and two within-subjects.

3.2.1 Phase 1 (uncertainty of incomes)/Phase 2 (certainty) - within-subjects

The first source of variation distinguishes, within-subjects, whether subjects are uninformed or informed of their initial incomes. In the course of the experiment we will refer interchangeably between Phase 1 / Phase 2 or uncertainty/certainty of initial positions. Some authors (including Durante et al.,

Table 1: Pre-tax income distributions

Income quintile	Switzerland (Low inequality)	South Africa (High inequality)
1	4.80€	1.25€
2	7.15€	2.35€
3	8.90€	4.00€
4	11.25€	7.95€
5	17.95€	34.45€
Income average ($\overline{X}$)	10.00€	10.00€

2014) tend to assimilate the condition in Phase 1 with choice under the *veil of ignorance*. Since, as previously reminded, the latter term refers to a construct used in political philosophy to induce a position of impartiality in disputing about just distributions from a purely normative perspective, we prefer not referring the uncertainty condition of initial incomes to the veil of ignorance.

3.2.2 Low (Switzerland)/high (South Africa) inequality - between-subjects

Table 2: Post-tax distributions in euro shown to subjects

Switzerland											
applied tax rate τ	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1^{st} quintile	4.80	5.32	5.84	6.36	6.88	7.40	7.92	8.44	8.96	9.48	10.00
2^{nd} quintile	7.15	7.44	7.72	8.01	8.29	8.58	8.86	9.15	9.43	9.72	10.00
3^{rd} quintile	8.90	9.01	9.12	9.23	9.34	9.45	9.56	9.67	9.78	9.89	10.00
4^{th} quintile	11.25	11.13	11.00	10.88	10.75	10.63	10.50	10.38	10.25	10.13	10.00
5^{th} quintile	17.95	17.16	16.36	15.57	14.77	13.98	13.18	12.39	11.59	10.80	10.00
Income ratio $^{5^{th}}/_{1^{st}}$	3.74	3.23	2.80	2.48	2.55	1.89	1.66	1.47	1.29	1.14	1

South Africa											
applied tax rate τ	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1^{st} quintile	1.25	2.13	3.00	3.88	4.75	5.63	6.50	7.38	8.25	9.13	10.00
2^{nd} quintile	2.35	3.12	3.88	4.65	5.41	6.18	6.94	7.71	8.47	9.24	10.00
3^{rd} quintile	4.00	4.60	5.20	5.80	6.40	7.00	7.60	8.20	8.80	9.40	10.00
4^{th} quintile	7.95	8.16	8.36	8.57	8.77	8.98	9.18	9.39	9.59	9.80	10.00
5^{th} quintile	34.45	32.01	29.56	27.12	24.67	22.23	19.78	17.34	14.89	12.45	10.00
Income ratio $^{5^{th}}/_{1^{st}}$	27.56	15.03	9.85	6.99	5.19	3.95	3.04	2.35	1.80	1.36	1

Countries' names and income ratios were not shown to participants.

The second source of variation concerns the level of pre-tax inequality. In order to study the effect of pre-tax inequality on preferences for redistribution we opted for a between-subject design to avoid any carry-over effects. Comparing national pre-tax inequality on a global level we identified South Africa (highest inequality index, World Bank, 2014) and Switzerland (lowest, Bundesamtfür Statistik, 2017) as the two extremes. Table 1 replicates the respective real pre-tax distributions in quintiles scaled down to an average income of 10€. One half of the subjects were exposed to the Switzerland pre-tax distribution (CH, low inequality) and the other half to the South African (ZA, high inequality). Countries were not specified to avoid confounding effects.

3.2.3 Random/effort based income assignment - between-subjects

The second between-subjects variable adds an alternative conduct to allocate pre-tax income. While in half of the sessions the computer assigned pre-tax incomes randomly to subjects, in the other half they were based on relative performance in a real effort game (Gill and Prowse, 2012). Within two minutes subjects had to place as many sliders as possible in the center of a bar. In addition, subjects indicated their expected income quintile beforehand according to their expected performance. Although Gill and Prowse (2019) argue for superiority of the slider task in comparison with other real-effort tasks, we tried to minimize task-specific effects on subjects' performance expectations by placing it after the first tax choice (Fig. 1).[10]

3.2.4 Low/high income mobility - within-subjects

One purpose of our experiment is to analyse the impact of actual mobility on preferences for redistribution. Accordingly, subjects stated their preferred tax rate in both phases of the experiment for two 5x5 income transition matrices, shown in Table 3. In the low (high) mobility matrix, much (little) weight lays on the diagonal resulting in a low (high) likelihood to move up- and downward

[10] Alternative real-effort tasks used to allocate income positions in related experiments include manual ability tests, quizes of general knowledge, or mathematical or linguistic (reading, spelling, etc.) competence games. Results do not seem to vary greatly. Durante et al. (2014) do not find significant differences between assigning income positions either using a Tetris game or a general knowledge quiz.

in the income distribution. In fact, the low mobility matrix does not entail the POUM hypothesis — the expected income after the final period for subjects with a median income in the initial period (i.e. subjects in the third quintile) lingers below average — while the high mobility matrix does.[11] Instructions made also clear to subjects that the pre-tax distributions remain constant across the mobility process comprising four subjects per quintile at all times..

The choice of a (5x5) mobility table was partly determined by the purpose of making intelligible the matrix functioning to subjects while maintaining salience with real world diversity of social classes. The feedback from a pilot experiment in which we tested subjects' comprehension of mobility tables confirmed our considerations in favour of 5x5 order matrices.

Table 3: Income mobility tables

Low mobility

from\to	1^{st} quintile	2^{nd} quintile	3^{rd} quintile	4^{th} quintile	5^{th} quintile
1^{st} quintile	75%	25%	0%	0%	0%
2^{nd} quintile	25%	50%	25%	0%	0%
3^{rd} quintile	0%	25%	50%	25%	0%
4^{th} quintile	0%	0%	25%	50%	25%
5^{th} quintile	0%	0%	0%	25%	75%

High mobility

from\to	1^{st} quintile	2^{nd} quintile	3^{rd} quintile	4^{th} quintile	5^{th} quintile
1^{st} quintile	50%	25%	0%	25%	0%
2^{nd} quintile	25%	25%	25%	25%	0%
3^{rd} quintile	25%	0%	25%	25%	25%
4^{th} quintile	0%	25%	25%	25%	25%
5^{th} quintile	0%	25%	25%	0%	50%

3.3 Theoretical predictions

Combining the four experimental variations grants a 4x4 treatments design. Two separate sessions with 20 participants were devoted to each of the 4x4 treatments, for a total of 40 observations per condition. Table 4 summarises

[11] The low mobility matrix is inspired by existing levels of income mobility in South Africa (Finn and Leibbrandt, 2013), high mobility replicates Scandinavian countries (Jantti et al., 2006).

all treatments along the predictions by three classical criteria for redistributive demand. The three criteria are those most directly linked to the approaches of rational and social preferences reviewed above; we discuss other possible effects which do not enter into the most standard concepts at the section finale.

3.3.1 Profit maximization

The first criterion represents expected payoff maximization (Table 4, column 2). It is equivalent to risk neutral behavior. The optimal tax rate τ for any subject h derives in this case by the comparison between the mean income $\overline{X} = 10$ in all treatments, and the subject's expected income before tax and transfers, denoted by $E_h[X]$. In treatments of Phase 1 with random income assignments and in all Phase 2 treatments, τ can be computed using objective probabilities. In random treatments of Phase 1 it is $E_h[X]=10$ for all subjects h, implying that any subject can indifferently choose τ in the interval $[0, 1]$ leading to an average tax rate of 0.5. In treatments of Phase 2, after subjects have been assigned to an income class, τ depends on the mobility matrix considered. Under low mobility, it is $E_h[X] < 10$ and hence $\tau = 1$, for all subjects h in the three lower quintiles, i.e. 60% of subjects; and $E_h[X] > 10$ hence $\tau = 0$, for all subjects h in the two top quintiles, that is 40% of subjects. Opposite frequencies hold for the high mobility matrix, namely 40% of subjects with $\tau = 1$ and 60% with $\tau = 0$. In fact, remark that since the predictions identify the poorer and richer than average in terms of expected future incomes (for short *prospective poor* and *prospective rich*), they incorporate directly the POUM hypothesis.

In the effort treatments of Phase 1 comparison between $\overline{X}$ and $E_h[X]$ depends on subject h's expected performance in the effort task. Overconfidence and other expectation distortions can then possibly enter the story (see below).

3.3.2 Risk aversion

Column 3 in Table 4 provides the predictions from risk aversion. Risk aversion implies that subjects with $E_h[X] < 10$ vote for full redistribution, i.e. $\tau=1$; while subjects with $E_h[X] > 10$ will prefer τ greater than 0 by a precise amount depending on the individual degree of risk aversion. Risk aversion can also affect the predictions of the POUM hypothesis when people with $E_h[X] > 10$ pre-

fer redistribution fearing the chances of moving downwards, which are greater with high than low mobility. Also, due to risk aversion the demand for redistribution must be higher facing high inequality (ZA) than low inequality (CH).

3.3.3 Other-regarding preferences

The predictions for social preferences in column 4 of Table 4 are based on the model of Charness and Rabin (2002). Durante et al. (2014) also use the model withe some modifications (see in Appendix C). It expresses people's utility in form of a linear combination of selfish and social motivations. A person's own expected payoff represents the selfish motivation in the original model, while the other-regarding component, relevant in our experiment, is captured by a Rawlsian concern for the person with the lowest post-tax income.[12] The relative weighting of the two motivations points the way for subjects' preferred tax rates. The predictions are straightforward. Subjects with $E_h[X] < \overline{X}=10$ always vote for full redistribution ($\tau = 1$); subjects with $E_h[X] > 10$ choose either $\tau = 0$ or 1 depending on their degree of inequality aversion relative to selfish motivation. The predictions show in this sense some overlap with those derived from risk aversion. In Appendix C we estimate an extension of the model employed by Durante et al. (2014), which allows for separation of the two attitudes.

3.3.4 Further behavioural drivers

Other issues reviewed in Section 2 which are not captured by the analyzed standard theories above can alter the predictions in Table 4. First of all, the mechanism of income assignment can pivot preferences towards higher or lower demand for redistribution. Subjects considering the random assignment more unfair than the assignment based on effort are inclined to support more redistribution under the first than under the second condition; the opposite applies for individuals who find some fairness in the random assignment. In the effort treatments of Phase 1 the method of income determination can interact with subjects' expectations about their income position. Mainly, overestimation of income positions due to overconfidence can depress the demand for redistri-

[12] The original model accounts moreover for efficiency in the social component. Here it is disregarded since the redistribution scheme applied does not include efficiency costs.

bution in the effort treatments of Phase 1, but not in the random treatments. As there are more reasons to overestimate when incomes are further away than when they are close to each other, a first question is whether overconfidence increases in pre-tax inequality (hence, in South Africa more than in Switzerland). A second question concerns the possibly defusing effect of income mobility on overconfidence which would realize in a lower demand for redistribution with low than with high mobility (the reverse POUM).

4 Analysis & results

This section presents the main observations in the data. We start with an overview of the tax choices and move then to econometric tests.[13]

4.1 An overview of the tax choices

Figure 2 reports the distributions of tax rates chosen by participants. The top panels show the distributions in treatments of Phase 1 and the bottom panels these of Phase 2. The vertical red bars mark average tax rates.

Phase 1

Tax rates in most treatments of Phase 1 are not statistically different from 0.5.[14] Two exceptions represent the low mobility treatments with effort, where distributions skew slightly to the right and average tax rates are just above 0.4 in both Switzerland and South Africa (significantly different from 0.5 at $p = 0.043$ and $p = 0.055$). Uniform distributions are consistent with the prediction of expected payoff maximization that subjects choose with equal probability any τ between $[0, 1]$, yet they are inconsistent with inequality aversion and risk aversion. Occurring tax rates even below 0.5 in the effort treatments under low mobility but not under high mobility is suggestive on the one side of overconfidence. On the other side it advocates an effect which we have termed as the

[13] Appendix B reports the results of a series of non-parametric tests conducted at support of the descriptive analysis.

[14] A series of one-sample Kolmogorov-Smirnov tests for discrete distributions (reported in Appendix B, Table B2) accept the null-hypothesis of uniform distributions in all but three treatments of Phase 1, i.e. the Switzerland treatment with random assignment and high mobility ($p = 0.070$), and the South Africa treatments with effort (low mobility and high mobility: $p = 0.030$ and $p = 0.021$, respectively).

Table 4: Treatments and predictions

Treatments	Predictions: Maximization of expected earnings[1]	Predictions: Risk aversion[2] (demand of self-insurance)	Predictions: Social preferences[3]
Phase 1 - Uncertainty of initial positions:			
- Random income assignment, low and high mobility, low and high inequality (Switzerland & South Africa)	Any τ in $[0,1]$	$\tau = 1$	$\tau = 1$
- Effort based income assignment, low and high mobility, low and high inequality (Switzerland and South Africa)	Predictions are the same as in the treatments of Phase 2, with $E_h[X]$ which depends on subject h's expected of performance in effort task.	Predictions are the same as in the treatments of Phase 2, with $E_h[X]$ which depends on subject h's expected of performance in effort task.	Predictions are the same as in the treatments of Phase 2, with $E_h[X]$ which depends on subject h's expected of performance in effort task.
Phase 2 - Certainty of initial positions:			
- Low and high mobility, random and effort based income assignment, low and high inequality (Switzerland and South Africa)	$\tau=1$ for subjects with $E_h[X]<10$ (prospective poor); and $\tau=0$ for subjects with $E_h[X]>10$ (prospective rich). Prospective poor are 60% under low mobility and 40% under high mobility; opposite frequencies hold prospective rich.	$\tau = 1$ for subjects with $E_h[X]<10$; and $\tau > 0$ for subjects with $E_h[X]>10$ by an amount which depends on degree of risk aversion. Moreover, for same degree of risk aversion and same income quintile, τ in South Africa expected to be higher than in Switzerland.	$\tau = 1$ for subjects with $E_h[X]<10$ and for subjects with $E_h[X]>10$ with high degree of inequality aversion; and $\tau = 0$ for subjects with $E_h[X]>10$ with low degree of inequality aversion. Moreover, for same degree of inequality aversion and same income quintile, more likely that $\tau=1$ in South Africa than in Switzerland.

Notes: 1) In the predictions $E_h[X] = \sum_{j=1}^{5} \pi_{hj} X_j$, where π_{hj} is the probability at the time of the decision of individual h being in income quintile j after transition. It is given by: i) $\pi_{hj} = \frac{1}{5}\sum_{i=1}^{5} p_{ij}$ in the random treatments of Phase 1, where p_{ij} is the transition probability from quintile i to quintile j in the mobility tables (low/high); ii) $\pi_{hj} = \sum_{i=1}^{5} \pi_h^i p_{ij}$ in the real-effort treatment of Phase 1, where π_h^i is the subjective probability of subject h to end-up in income quintile i in the real-effort task; and iii) $p_{hj} = p_{ij}$ in all treatments of Phase 2, for any subject h who at the end of Phase 1 is in quintile i.
2) Predictions under risk aversion follow from Jensen's inequality stating that $E_h\left[u_h(Y_h)\right] \leq u_h(E_h\left[Y_h\right])$ for any increasing and concave utility function u_h, where $E_h\left[Y_h\right] = E_h\left[(1-\tau)X_h + \tau\overline{X}\right]$ is subject h's post-tax expected income, so that $u_h\left(E_h\left[Y_h\right]\right) < u_h(\overline{X})$ whenever $E_h\left[X_h\right] < \overline{X}$.
3) Predictions for social preferences are based on the following utility function adapted from Charness and Rabin (2002) and Durante et al. (2014) (Appendix C for a thourough discussion): $V_h = (1-\lambda)E_h[Y_h] + \lambda Y^{min}$, where $E_h[Y_h] = \sum_{j=1}^{5} \pi_{hj} X_j(1-\tau) + \tau\overline{X}$ is subject h's post-tax expected income, $Y^{min} = X^{min}(1-\tau) + \tau\overline{X}$ is the minimum society's post-tax income, and $\lambda \in (0,1)$ is the relative weight for personal versus inequality concern.

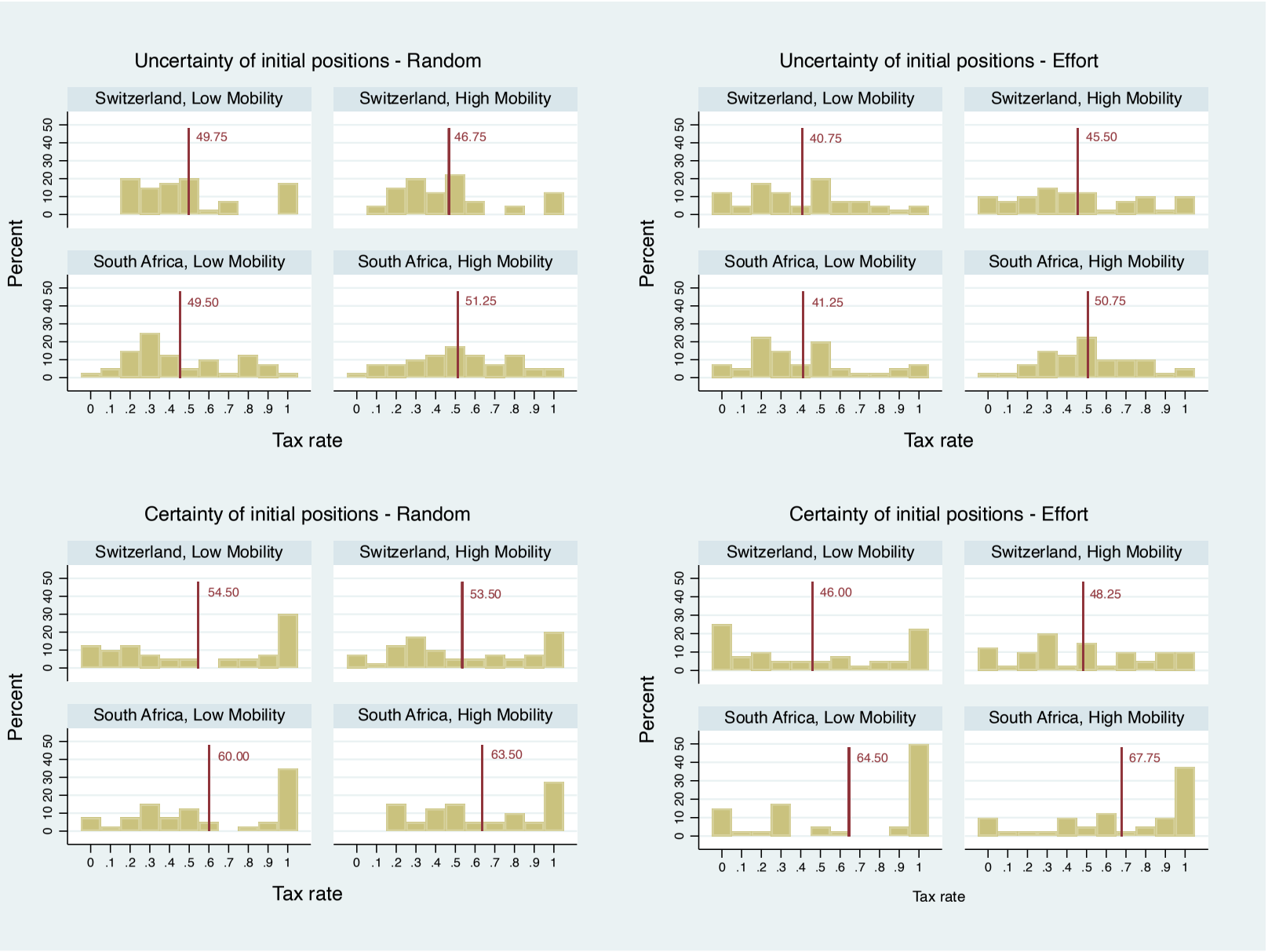


Figure 2: Tax choice histograms

reverse POUM, namely that under high mobility people's overconfidence is offset by a higher chance of moving downwards in the mobility process. Below we investigate in depth this hypothesis.

Phase 2

After lifting uncertainty of initial positions in Phase 2, we can easily detect an increase in tax rates. Average rates between Phase 1 and Phase 2 increase by 11% ($p < 0.0001$). The South Africa treatments drive the effect (+17%, $p < 0.0001$), while there is only mild evidence for Switzerland (+5%, $p = 0.071$).

The distributions in Phase 2 take on different shapes as compared to those in Phase 1. In line with the theoretical predictions in Table 4 weights move towards the ends of the tax scale, i.e. fat tails. There are, however, notable differences from the strict predictions for corner solutions. First and foremost, across all treatments we observe very few choices of $\tau = 0$ (overall 11% in Phase 2). These frequencies are lower than predicted by the principle of expected earnings maximization. Moreover, observations fall short from the predictions by all theories for full redistribution ($\tau = 1$), i.e. overall 34% in the low and 24% in the high mobility treatments of Phase 2, versus the predictions of at least 60% and 40%, respectively. Only in the low mobility treatments of South Africa the proportions obtain the majoritarian share of 50%.

A further point to notice is that in Phase 2 the frequency of choices for $\tau = 1$ is always greater in the low than in the high mobility treatments for corresponding conditions. While this is consistent with the rationale behind the POUM hypothesis, the POUM hypothesis is even stronger since it requires that under low mobility more people demand $\tau = 1$ than $\tau = 0$, but the opposite under high mobility. This is clearly contradicted by the histograms for Phase 2.

Post-tax inequality

In Table 5 we also look at the level of post-tax inequality obtained by applying the majoritarian rule (median tax rates) in the experimental treatments. Two results are worth noticing. The first confirms that also post-tax inequality based on median tax rates amounts always higher, for corresponding treatments, in Phase 1 than in Phase 2. This contradicts the prediction of more redistribution with more uncertainty. The second result follows from comparing Switzerland

Table 5: Redistribution and post-tax inequality under majority rule

Switzerland (CH)	U_R_LM	U_R_HM	U_E_LM	U_E_HM	C_R_LM	C_R_HM	C_E_LM	C_E_HM
Median tax rate	0.40	0.40	0.40	0.40	0.50	0.50	0.40	0.50
Post-tax income ratio $^{5th}/_{1st}$	2.55	2.55	2.55	2.55	1.89	1.89	2.55	1.89
South Africa (ZA)	U_R_LM	U_R_HM	U_E_LM	U_E_HM	C_R_LM	C_R_HM	C_E_LM	C_E_HM
Median tax rate	0.40	0.50	0.40	0.50	0.50	0.60	0.90	0.80
Post-tax income ratio $^{5th}/_{1st}$	5.19	3.95	5.19	3.95	3.95	3.04	1.36	1.80

Legend. The acronyms are as follows: the first digit is U/C for uncertainty (Phase 1)/certainty (Phase 2) of initial positions; the second is R/E for random/effort income assignment; the third is LM/HM for low/high mobility Thus, for example, U_R_LM stands for the treatment with uncertain income position (Phase 1), random income assignment, low mobility in the specified country.

to South Africa. Since in Phase 1 there are virtually no differences in the distributions of tax rates between corresponding treatments,[15] taxation corrects only partially for the different pre-tax inequality in the two countries. In all treatments of Phase 1 post-tax inequality, measured by the ratio between the highest and lowest income quintile, is twice as large in ZA than in CH. The same holds true for the random treatments of Phase 2. Only in the effort treatments of Phase 2 inequality after taxation becomes comparable in the two countries.

We come back to the evidence on post-tax inequality after having investigated subjects' choices by means regression analyses. We start from Phase 1.

4.1.1 Tax choices when initial positions are uncertain - Phase 1

Table 6 reports the estimates of various Tobit regressions. In all models the dependent variable is the tax rate τ_h, chosen by subject h.[16]

Model (1) tests for the general effect of uncertainty of initial income positions. Consistent with the histograms the estimate indicates a negative effect from uncertainty about initial income positions on tax rates. The effect is highly significant according to the Tobit estimation, with a reduction in average tax rates between Phase 1 and Phase 2 by almost 15 percentage points.[17] A dummy for gender on the whole experiment is statistically not significant.

[15] A series of unmatched Mann-Whitney-Wilcoxon rank-sum tests (Appendix B, Table B4) confirm the visual inspection from the histograms considered in this paragraph, indicating significant different distributions of tax rates between Switzerland and South Africa only for the effort treatments of Phase 2 both with low and high mobility.

[16] In the experiment some treatments are between-subjects and some treatments within-subjects. Therefore, here and in the following regressions standard errors are always adjusted for correlation of observations within subject h's responses.

Table 6: Tobit regressions - Phase 1: Uncertainty of initial positions

	(1) Phase 1 & Phase 2	(2) Phase 1	(3) Phase 1 Random	(4) Phase 1 Effort	(5) Phase 1 Effort	(6) Phase 1 Effort
Dependent variable:	τ_h	τ_h	τ_h	τ_h	τ_h	τ_h
Phase 1	-0.147***					
	(0.034)					
High inequality (South Africa)		0.014	-0.013	0.022	0.027	0.057
		(0.043)	(0.059)	(0.064)	(0.066)	(0.065)
Low mobility		-0.046**	-0.013	-0.080**	-0.087**	-0.081**
		(0.023)	(0.028)	(0.036)	(0.040)	(0.040)
Effort		-0.053				
		(0.043)				
Prospective poor from self-ass.					0.032	0.153*
					(0.065)	(0.089)
Prospective poor from self-ass. * female						-0.254**
						(0.119)
Female	-0.008	-0.030	-0.120**	0.065	0.058	0.144*
	(0.052)	(0.042)	(0.059)	(0.063)	(0.065)	(0.083)
Constant	0.621***	0.524***	0.564***	0.445***	0.437***	0.388***
	(0.050)	(0.046)	(0.060)	(0.057)	(0.060)	(0.065)
Observations	640	320	160	160	160	160
Log-pseudolikelihood	-448.301	-116.290	-45.129	-66.097	-65.940	-63.264
Pseudo R-squared	0.020	0.020	0.072	0.033	0.035	0.074

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Mobility effects

Model (2) regresses preferred tax rates in Phase 1 on three dummies for, in the order, high inequality, low mobility and whether the participants are in the random or in the effort treatments. Alone the mobility dummy is negatively significant. Yet, its sign is inconsistent with the POUM hypothesis predicting that, if agents are not too risk averse and hold rational expectations, tax rates under low must be higher than under high mobility. The evidence can instead be consistent with a reverse POUM effect driven by overconfidence (see below).

Random vs. effort treatments

Models (3) and (4) distinguish random from effort treatments in Phase 1. In the random treatments is exclusively the gender dummy statistically significant indicating a lower demand for redistribution by women than men. Other

[17] Note the difference between the Tobit estimate and the one based on the sample averages (+11% reported above), due to the correction for censored data.

studies have also found the opposite, with women favouring more redistribution than men (Alesina and Giuliano, 2011). Here the effect stems from a lower proportion of women choosing full redistribution ($\tau = 1$).[18] Overall, subjects' choices in the random treatments are largely consistent with risk neutrality,[19] including non-significance of the dummy for high inequality (South Africa).

In line with the credited effect of overconfidence, the impact of low mobility bears mere significance in the effort treatments (model 4). The gender dummy in model (4) is not statistically significant, while the negative impact of low mobility cuts the estimated average tax rate down to 0.365 (namely $0.445 - 0.080$, significantly less than 0.5, $p < 0.012$). Interestingly, the dummy for South Africa is also not significant. Differently from the random treatments, however, this cannot be explained by risk neutrality alone.[20] On the other end, it can be explained with overconfidence being higher in South Africa than in Switzerland in order to compensate for greater pre-tax inequality in the former than in the latter country. The latter conjecture is also confirmed by subjects' self-assessments about expected performance in the effort task. Assessments are reported in the histograms of Figure 3. They indicate that subjects overestimate the probability to obtain better-than-average income quintiles and underestimate the probability to obtain lower-than-average income quintiles. Effects are large and significant for South Africa and for men; they are less pronounced for Switzerland and generally not significant for females.[21]

Self-assessments must be taken with care. They are not incentivised and based on subjects' expectations to obtain one specific quintile rather than on the

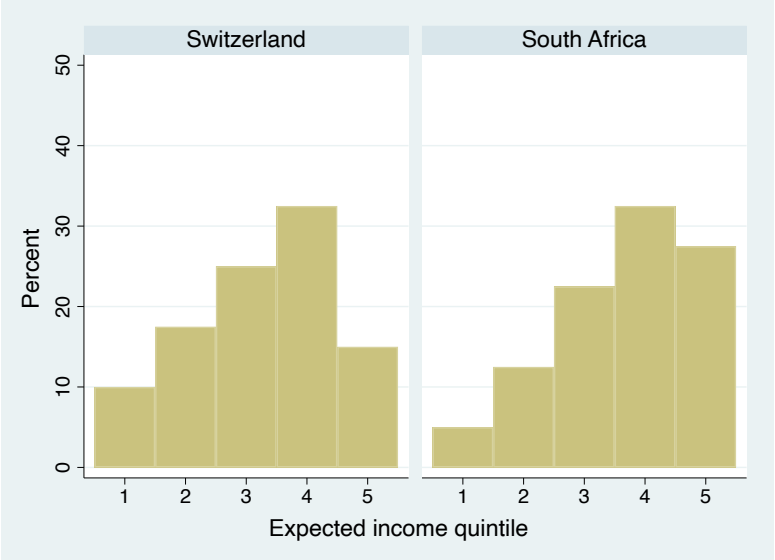
[18] On a total of 160 observations in the random treatments of Phase 1, those for $\tau = 1$ were 15 (about 10%) of which 14 were stated b males and 1 by a female. Omitting the upper corner solution, the average tax rate for $\tau \in [0, 1)$ is equal to 0.43 both for males and females. We will return to the evidence of women being more reluctant than men to vote for full redistribution in the discussion of the results from Phase 2.

[19] The estimated averages in particular are 0.564 for men and 0.44 for women, not statistically different from 0.5 at $p = 0.288$ and $p = 0.191$, respectively.

[20] In particular remark that for risk neutrality to explain the evidence it would require that a typical subject h's expectations of self-performance in the effort task are such that $E_h[X] = 10$ (for example, subject h holds equally likely to end up in any income class). In such a case, however, the dummy for low mobility should also be not significant (as indeed in the random treatments).

[21] Concerning confidence in self-assessments, the vast majority of subjects (76%) stated they were 'fairly confident' about self-assessments, 18% that they were 'very confident', and 6% that they were 'not confident at all'.

Figure 3: Subjects' self-assessments in the effort task



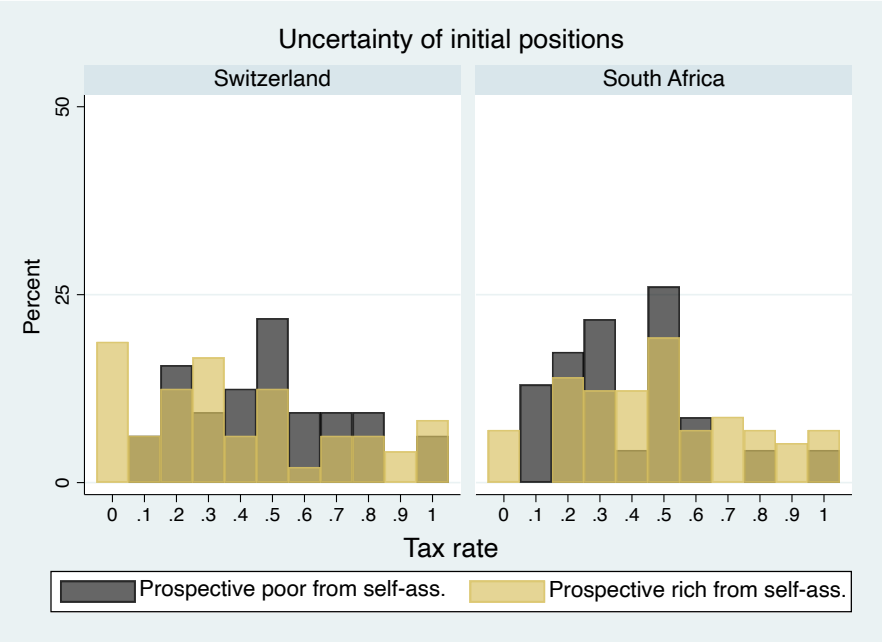
In Switzerland the overall proportions of lower-than-average (quintiles 1 and 2) and better-than-average (quintiles 4 and 5) self-assessments are 0.275 and 0.475, respectively (difference-of-proportion test $d = 1.85$, $p = 0.064$). In South Africa the proportions in the same order are 0.175 and 0.600 ($d = 3.90$, $p < 0.0001$). For females the proportions are 0.25 and 0.50 ($d = 1.264$, $p = 0.206$) in Switzerland; and 0.285 and 0.333 ($d = 0.334$, $p = 0.739$) in South Africa; for males the proportions are 0.286 and 0.464 ($d = 1.38$, $p = 0.167$) in Switzerland; and 0.053 and 0.895 ($d = 5.198$, $p < 0.0000$) in South Africa.

distribution of subjective beliefs to end up in any quintile. Moreover, different psychological drivers can affect stated self-assessments and actual decisions, e.g. in forms of wishful thinking and optimism (Heger and Papageorge, 2018).

Prospective poor vs. prospective rich

It is nevertheless worth checking how self-assessments relate to subjects' preferred tax rates. To this end we use the self-assessments to compute subjects' expected pre-tax income $E_h[X]$'s and separate the ones with $E_h[X] < 10$ from those with $E_h[X] > 10$. We term the first group as 'prospective poor from self-assessments' and the second as 'prospective rich from self-assessments'. Figure 4 shows the distribution of stated tax rates for the two groups in Switzerland and South Africa. In both inequality treatments there are little differences between the distributions for the two defined groups. This suggests that stated

Figure 4: Prospective poor/rich self-assessed in effort treatments of Phase 1



self-assessments by itself cannot explain the preferred tax rates.

Model (5) of Table 6 includes therefore a dummy for prospective poor in the Tobit regression which does not prove to be significant, though. Since fewer females report overconfidence in self-assessments, in model (6) we interact dummies for female and prospective poor for improving estimates. While both dummies for prospective poor and for female turn positive now, the interaction term becomes negative by an amount which compensates almost entirely for the two positive dummies ($0.153 + 0.144 - 0.254 = 0.043$, $p = 0.581$).[22]

This seems to indicate that whereas women were in the experiment less exuberant than males to inflate stated self-assessments, they were similarly prone to overoptimism when actually choosing the tax rates. More generally, the evidence supports the idea that stated self-assessments capture only part of the effect on preferred tax rates arising from overconfidence, optimism, or wishful-thinking. We sum up the evidence of Phase 1 as follows.

[22]Remark that in this case the negative effect of prospective poor females cannot be explained with a lower tendency of women than men to vote for $\tau = 1$ since in all effort treatments of Phase 1 only 11 subjects voted for full redistribution (5 males and 6 females).

Result 1. *When subjects are uncertain about initial income positions self-interest and risk neutral behaviour dictate their demand for redistribution, while risk and inequality aversion are violated. This yields subjects choosing similar tax rates under conditions of low and high inequality in treatments with random income assignment. When initial income positions depend on real-effort, subjects' choices are further affected by general overconfidence, which causes a reverse POUM effect and bears stronger under high inequality (South Africa) than under low inequality (Switzerland) realizing in a similar low demand for redistribution across the two countries.*

4.1.2 Tax choices when initial incomes are known - Phase 2

Table 7 provides results of Tobit regressions for the treatments in Phase 2, after that subjects have been informed of initial positions but before the transition process has determined subjects' pre-tax incomes to be taxed. Model (1) encompasses only a dummy for gender, which is statistically not significant. The constant (0.636) exceeds 0.5 ($p = 0.0023$) indicating an influence of risk aversion and inequality aversion in Phase 2.[23]

Model (2) adds dummies for high inequality, low mobility and effort-based income assignment. The dummy for inequality is highly significant, showing that in Phase 2 subjects demand tax rates 23 percent points higher in South Africa than in Switzerland. The dummies for effort and low mobility do not exert significant effects. Missing statistical evidence regarding the latter violates the POUM hypothesis.

Prospective poor vs. prospective rich 2.0

Model (3) investigates further the effects of abandoning risk neutrality. To this end, the model adds a dummy for the 'prospective poor' (subjects' with $E_h[X] < 10$). Were the data fully explained by maximisation of expected earnings the coefficient on the dummy ought to be 1 while all other coefficients should be 0, including the constant. Instead, the coefficient on the dummy is significantly less than 1 ($p < 0.01$) and the constant significantly greater than 0.

[23]Strictly speaking, either risk aversion or inequality aversion alone can explain a demand for redistribution greater than resulting from maximisation of expected earnings. Yet, estimations of a structural preferences model based on Charness and Rabin (2002) and Durante et al. (2014) in Appendix C confirms that both risk and inequality aversion are present in Phase 2.

Table 7: Tobit regressions - Phase 2: Certainty of initial positions

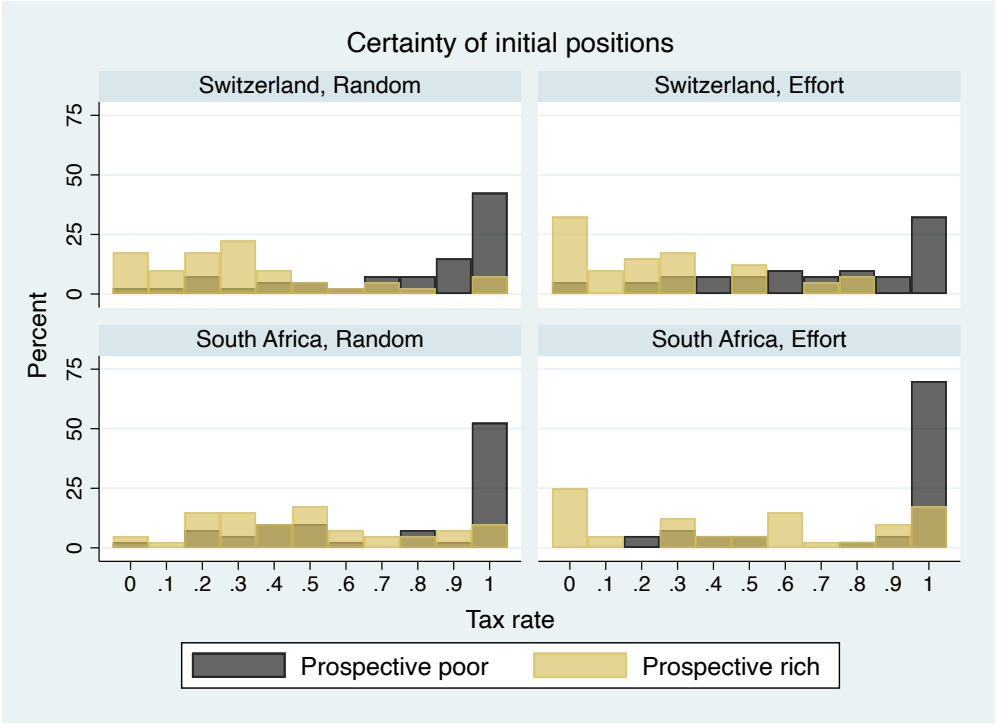
	(1) Phase 2	(2) Phase 2	(3) Phase 2	(4) Phase 2 Random	(5) Phase 2 Effort
Dependent variable:	τ_h	τ_h	τ_h	τ_h	τ_h
High inequality (South Africa)		0.232***	0.237***	0.124	0.330***
		(0.087)	(0.070)	(0.087)	(0.111)
Low mobility		-0.006	-0.133***	-0.109**	-0.158**
		(0.038)	(0.039)	(0.050)	(0.062)
Effort		-0.032	-0.038		
		(0.086)	(0.069)		
Prospective poor			0.610***	0.533***	0.697***
			(0.070)	(0.087)	(0.113)
Female	0.010	-0.022	-0.077	-0.224**	0.081
	(0.086)	(0.085)	(0.068)	(0.087)	(0.107)
Constant	0.636***	0.554***	0.337***	0.481***	0.165*
	(0.065)	(0.083)	(0.066)	(0.080)	(0.086)
Observations	320	320	320	160	160
Log-pseudolikelihood	-291.393	-285.176	-232.401	-103.544	-120.593
Pseudo R-squared	0.000	0.021	0.202	0.221	0.228

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

The positive constant implies that less prospective rich ($E_h[X] > 10$) than predicted under maximisation of expected earnings vote for no redistribution ($\tau = 0$), while the coefficient on the dummy lower than 1 indicates that less prospective poor than predicted vote for full redistribution ($\tau = 1$). Note that the first evidence can be explained with risk aversion and/or inequality aversion, while the second also violates the latter theories. The coefficients on high inequality and low mobility are also highly statistically significant: positive the first, negative the second. The latter can be explained with risk aversion.

Models (4) and (5) conduct separate regressions for the random and the effort treatments surfacing notable effects. The dummy for high inequality is only significant across effort treatments; also in the effort treatments the dummy coefficient for 'prospective poor' is higher and the constant is lower compared to the random treatments. These results indicate that the redistributive conflict between prospective poor and prospective rich is more polarized in effort treatments than in random treatments, particularly so in the high inequality context. Similarly to Phase 1, there is a negative gender effect in the random treatments due to a lower propensity of females to vote for full redistribution (see discussion on Table 8 below for specific evidence).

Figure 5: Prospective poor and and prospective rich in Phase 2



The polarization of preferences between prospective rich and prospective poor in Phase 2 comes also visible in the histograms in Figure 5, showing distributions of reported tax rates for the two income groups divided between low/high inequality and random/effort assignment.

Among other things the histograms highlight the demand for full redistribution by the prospective poor and the opposition to any redistribution by the prospective rich. Table 8 deepens analysis of such behavior by means of probit regressions. The probit are separated for random and effort assignment. In the probit for prospective poor the dependent variable is 1 if the subject reports a tax rate equal 1 and 0 otherwise; while in the probit for prospective rich the dependent variable is 1 if the subject reports a tax rate equal 0 and 0 otherwise.

The probit (and the histograms) illustrate that prospective rich are more likely to be fully selfish in effort (model 4) than in random treatments (model 2; the predicted probability of $\tau = 0$ at mean values is 27% in effort compared to 6.9% in random treatments). In the random treatment prospective rich become also less selfish with growing inequality (marginal effect of South Africa

in model 2 is -13%). Less so in the effort treatment. Conversely, in the effort treatment prospective poor are more ready to impose full expropriation over the rich in South Africa than in Switzerland (marginal effect of South Africa in model 3 is +36%). The positive sign of the low mobility dummies in the probit for prospective rich (both in effort and random treatments) are in accordance with risk aversion. In the probit for prospective poor the dummies are positive but only marginally significant in the random treatment (model 1).[24] As anticipated, the gender dummy is significantly negative in model 1 with large marginal effects (-36%). Conversely, gender does not play a significant role in effort treatments, which corroborates the general evidence of similar behaviour between males and females when income positions are effort-based (except for stated self-assessments).

Finally, using the probit to compute predicted probabilities of prospective poor to demand full redistribution obtains the following. In the South Africa effort treatment the probability is 71%; 53 % in the random treatment. For Switzerland probabilities are 41% and 32% in random and effort treatments. So while the data confirms general reluctance of the poor to expropriate the rich, they also indicate that such timidity lessens substantially in the effort treatments with high inequality. We sum up the evidence from Phase 2 as follows.

Result 2. *In Phase 2, with information of initial income positions, participants' choices evolve more consistently with considerations of risk aversion and inequality aversion, yet less apprehended by risk neutral behaviour. Several other drivers affect subjects' behaviour, too. First of all, average demand for redistribution is greater under high than under low inequality, but only when incomes are assigned by the real-effort task instead of allocated randomly. The distributional conflict between prospective poor and prospective rich also emerges more polarized when effort rather than lack determines income positions. Under high inequality this conflict pushes preferred tax rates close to full redistribution. In all other treatments the redistributive demand remains well below full redistribution also by individuals expecting to be poor; this reluctance to expropriate the rich is stronger among female than male participants.*

[24] A positive dummy is consistent with the rational behind the POUM hypothesis. In particular, although the definitions of prospective poor and rich are already based on expected incomes, all prospective poor have better chances to move up under high than low mobility.

Table 8: Probit regressions - Prospective poor and prospective rich in Phase 2

	(1) Phase 2 - Random Prosp. poor	(2) Phase 2 - Random Prosp. rich	(3) Phase 2 - Effort Prosp. poor	(4) Phase 2 - Effort Prosp. rich
Dependent variable:	$Pr(\tau_h = 1)$	$Pr(\tau_h = 0)$	$Pr(\tau_h = 1)$	$Pr(\tau_h = 0)$
High inequality (South Africa)	0.298	-0.836*	1.054***	-0.227
	(0.385)	(0.432)	(0.395)	(0.349)
Low mobility	0.326*	1.056***	0.365	0.722***
	(0.181)	(0.395)	(0.223)	(0.272)
Female	-1.068***	-0.247	-0.155	-0.354
	(0.389)	(0.435)	(0.395)	(0.329)
Constant	0.142	-1.375***	-0.637**	-0.658**
	(0.346)	(0.417)	(0.318)	(0.292)
Observations	80	80	80	80
Log-pseudolikelihood	-47.767	-23.015	-48.841	-44.228
Pseudo R-squared	0.137	0.182	0.119	0.078

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

5 Discussion

Here we recap the results from the experiment in the context of the theories of redistributive preferences reviewed in Section 2. Then we combine the main findings to elaborate the idea of an inequality trap and to indicate questions for future research.

5.1 What shapes redistribution preferences?

The literature has discussed distinct drivers behind people's demand for redistribution. Our results exhibit an articulated picture which provides, on the one hand, support for various behavioural models, on the other hand, questions the relevance of others for the present data set.

A first observation points to differences in preferences for redistribution between the two Phases of the experiment: while in Phase 1 choices appear mainly driven by selfish considerations even with some over-exposition to risk, behaviours in Phase 2 are overall more consistent with a mix of motivations, including risk aversion and social concern. The evidence on Phase 1 is especially surprising since standard theories of rational behavior assume that the demand for self-protection increases in uncertainty. All the more, considering previous research which argued that missing transparency about the relative standing in the income ladder resembles an hypothetical decision maker choosing behind

a veil of ignorance, which has been further employed by theorists to explain and model people's impersonal, or social preferences (Harsanyi, 1977).

A possible explanation for the lack of social concern in Phase 1 is the following. Same ex-ante chances among all individuals may be perceived as a situation of equal or fair opportunities, and for this reason one which the society does not need to correct for. Given complete uncertainty about one's own position, subjects' cognitive attention in Phase 1 may also be focussed on 'oneself' rather than on 'others', leading to more egoistic behaviour compared to when initial positions are known.

Certainly, an important self-focussed reason for the low tax rates in Phase 1 assembles subjects' overconfidence about the likelihood of reaching top income classes. The bias is apparent in the effort treatments; in random treatments overconfidence cannot affect responses. In fact, misperception and overoptimism about the own prospects in life are behavioral effects well-known in the literature and documented in experiments on preference for redistribution (Durante et al., 2014). We add two relevant features. Firstly, by allowing the effect of overconfidence in the social mobility process, we find that the bias can nullify the concavity implication of the actual mobility process and induce a reverse POUM effect. Secondly, we observe a positive relationship between the level of inequality in a society and a personal bias from overconfidence. Whether due to optimistic expectations or genuine beliefs to be better than others, the effects of overconfidence in the context of redistributive preferences can contribute to an inequality trap, discussed in more detail below.

When subjects are well informed about income positions we still observe effects inconsistent with common understanding of economic behaviour. Possibly the most puzzling one represents the majority of a subgroup in the random treatment of Phase 2. Though handicapped by initial low income positions prohibiting them with certainty to leave the below-mean income sector in the mobility process, they still refrain from demanding full taxation. In other words, these subjects voluntarily forgo the chance to equalize earnings even there exists no apparent reason in the random treatment why some subjects are entitled to a larger payoff than others. More generally, a large fraction (about 50% on the whole) with an expected income lower than the society's mean do not support full redistribution neither. This reluctance to expropriate the rich cannot be

explained by classical arguments appealing to rational agents. It cannot even be explained by social factors causing secondary divides between subjects benefiting from redistribution. Cultural and ideological factors including concepts such as reference point theory may instead give a rise to an explanation. Subjects enter the lab unconsciously equipped with ideas, attitudes, experiences, and other stimuli. In consequence, anchors based on those experiences and impulses can affect subjects' decisions. For example, as people are not used to full redistribution in reality, subjects may also abstain from it in the lab. Some students may suppress the aptitude to maximize personal earnings because of strong political views on the illegitimacy of expropriating taxation.

Nonetheless note that while these restraints can explain part of the evidence, the effect strength is also dependent on conditions and contexts. In the high inequality/effort treatments of Phase 2, for instance, the tax rate preferred by the majority of individuals approaches 100%. This evidence bears further relevance for the debate on perceived legitimacy of income differences. Some scholars have argued that when income depends on effort rather than luck, earnings are perceived more legitimate and demand for redistribution is lower. Our results in the South Africa treatments find the opposite: when incomes are not assigned randomly but through the effort task demand for redistribution is higher, the distributional conflict is more polarized and the income gap between the poor and the rich closes almost entirely (Table 5). A possible interpretation here goes: when pre-tax inequality is high prevailing a jackpot present, luck is perceived as a form of fairness.

5.2 An inequality trap?

We witness increasing social inequality yet decreasing demand for fiscal redistribution dating back to the 1970's. The present analysis shows that greater income inequality nudges people to overestimate their chances of obtaining a high position on the income ladder, which in turn leads to declining demand for taxation. Inequality continues to grow. On top of that, we find that with the wealth ambitions of the rich aspirants being better preserved under the rigid than the mobile transition matrix, demand for redistribution is further depressed with decreasing mobility. Thus, what can be called an *inequality trap* does not only affect social welfare today but its vicious circle works like a

downward spiral against the "self-regulating power" of democracy - economic redistribution - to adjust inequality tomorrow.

Is there a way to cut the spiral? Our analysis offer some answers to this question. First of all, it reveals that overconfidence rises in pre-tax inequality. Secondly, it highlights that when misperception and reasons for overconfidence resolve, demand for redistribution increases and lets post-tax inequality shrink. Although there exists little empirical data for a reality check on the finding of inequality-driven overestimation, results of the few conducted studies back such considerations.[25] Survey samples from rather equal societies exhibit less overestimation of relative income, mobility, or general inequality, than samples extracted from more unequal populations. Reducing pre-tax inequality and raising awareness for people's own position can thus represent two measures to invert the vicious circle. Also other studies attest that changes in perception can influence demand for redistribution (e.g. Norton and Ariely, 2011).

5.3 Limitations and future research

The present study is not without limitations. Future research may consider mainly two matters. Firstly, it would be important to further explore the effect of overconfidence on people's demand for redistribution. While overconfidence represents "perhaps the most robust finding in the psychology of judgment" (De Bondt and Thaler, 1995), it remains a complex phenomenon. Our findings confirm the need to separate between stated beliefs, which appear particularly inflated by men, and actual redistributive preferences with respect to which we do not find gender differences in treatments based on effort.

Secondly, our experiment has implemented a two-period model with exogenous pre-tax inequality and exchange mobility. It would be interesting to consider a longer dynamic horizon in which inequality can change with economic growth and economic mobility interacts with structural mobility. This

[25]Cruces et al. (2013) and Karadja et al. (2017) document little overestimation of relative income in their surveys of Argentinian respectively Swedish households. Argentina (Sweden) is among the most equal countries in South America (worldwide). Cojocaru (2014) finds greater prospects of upward mobility for EU member states than non-EU former Socialist economies. Western European countries expose generally greater inequality levels than ex-Soviet states. Kraus and Tan (2015) report considerable mobility overestimation in an US-American sample. The US are among the most unequal societies in the world.

would allow for investigation of the findings in a richer setting and increase the external validity of the analysis.

5.4 Concluding remarks

This study examines individual preferences for redistribution depending on the level of pre-tax inequality. We divided subjects in two separate experimental societies. One was allotted the pre-tax income distribution of South Africa while the other faced the distribution of Switzerland. Subjects exhibited significantly more optimism about their income position in the high inequality condition (South Africa); the highest income standing out may seduce people to overestimate the small probability to end up there. Moreover, we find individuals primed with the more unequal pre-tax distribution to also accept more inequality in the post-tax distribution. We construe both findings as practical examples of an inequality trap: unequal societies suffer from greater overestimation of relative income and tolerance of inequality, both leading to reduced demand for redistribution. Tolerance for inequality declines and the distributional conflict becomes more polarized as people learn their economic position. The danger of a society's further destabilization once caught in an inequality trap should not be dismissed. More empirical and experimental research is needed to confirm these findings and their applicative value for policy makers.

Appendix

A Experimental instructions (originally in Italian, ZA treatment)

You and the other 19 participants take part in this experiment. The experiment lasts about one hour and consists of two phases. You will receive a 5 € participation fee. In addition, you have the opportunity to make further earnings based on the decisions you take during the experiment. A random mechanism at the end of the experiment determines for which of the two phases in the experiment you are paid. You will be paid immediately after the experiment ends. Your decisions and earnings are kept confidential.

We start with an experimenter reading aloud the instructions for the first phase. The instructions for the second phase will be explained later. At the end of these instructions, you can ask questions before the experiment starts. The experiment concludes with a short questionnaire.

During the experiment, it is not permitted to speak or communicate in any form with the other participants. Comprehension of the following instructions is key to maximize your earnings beyond the 5 € for your participation. If you have a question at any time during the experiment, raise your hand and one of the experimenters will come to your desk and assist you.

Instructions for the first phase

In this phase of the experiment there are two periods. In period 1, all participants are assigned a gross income from a specific income distribution. This income constitutes the gross income of period 1.

In period 2, all participants will receive the gross income of period 2. The gross income in period 2 is determined by a potential increase or decrease of the gross income from period 1 according to an income transition table. This table transforms the gross income of period 1 into the gross income of period 2.

Your additional payment in the experiment is the net income you receive in period 2. The net income for period 2 is determined by applying a tax and transfer rate to your gross income of period 2.

Your decision is choosing the tax and transfer rate to be applied to the gross incomes of period 2. This choice will be made before knowing the gross income

that was assigned to you in period 1.

To determine your period-1 gross-income from the initial income distribution, you and the other participants will compete in a skill task. Your performance relative to the other participants in the skill competition will determine your gross income for period 1. Prior to the skill competition, we will ask you for a self-assessment of your following performance. (*alternatively in the random-assignment treatment:* In period 1, you will be randomly assigned by the computer to a gross income from the income distribution.)

Now we describe the various parts of the experiment.

The gross income distribution in period 1

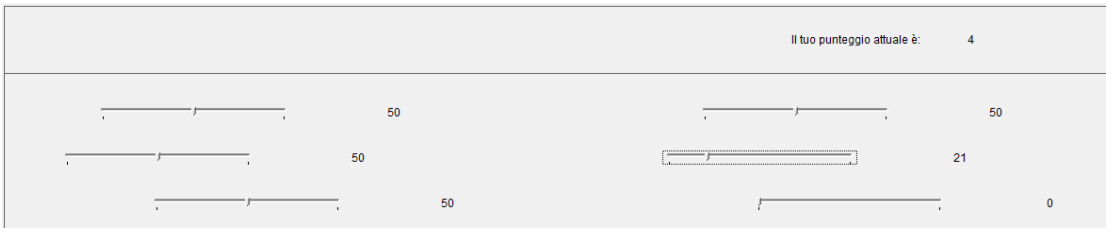
The following table shows the gross income distribution of one of the 40 largest economies in the world, scaled down to an average gross income of € 10.00. This distribution is made up of 5 income classes, containing 4 participants each. Hence, the participants' incomes resemble the gross income distribution of the particular country. The quantities in the right column of the table represent the gross incomes assigned to the various income classes in period 1. According to the table, this means that four participants receive an income of 1.25 €, four an income of 2.35 €, four an income of 4.00 €, four an income of 7.95 € and the remaining four participants will be assigned an income of 34.45 €.

Distribuzione dei redditi lordi

Fascie di reddito	Reddito lordo
prima	1.25 €
seconda	2.35 €
terza	4.00 €
quarta	7.95 €
quinta	34.45 €

How is gross income assigned in period 1?

Your income in period 1 will be one of those in the table. As indicated above, your exact gross income in period 1 will be determined based on your performance in relation to the performance of the other participants in a skill task.



In the skill competition, the computer screen will display a series of "sliding bars". Using the mouse and the directional keys of the keyboard, you need to place the cursor, which sits initially on left end of the bar, on the center value "50" for as many bars as possible. The skill task lasts 120 seconds.

The four participants with the highest score (most complete bars), i.e. the four participants on positions 1 to 4, receive an income of 34.45 €. An income of 7.95 € is assigned to the four participants ranking on positions 5 to 8. An income of 4.00 € is awarded to the four participants on positions 9 to 12. An income of 2.35 € is awarded to the four participants on positions 13 to 16. An income of 1.25 € will be awarded to the four participants on positions 17 to 20.

In the event of a tie, for example for 12th and 13th place, the computer will randomly assign each participant to one of the two income classes in question.

The skill task takes place at the end of the first phase of the experiment, such that the choices for the tax and transfer rate in period 2 will take place before knowing the income assigned in period 1.

(*alternatively in the random-assignment treatment:* Your income in period 1 will be one of those in the table. It will be randomly assigned to you by the computer. Specifically, the computer will randomly assign an income of 34.45 € to four participants, an income of 7.95 € to four, an income of 4.00 € to four, an income of 2.35 € to four, and an income of 1.25 € to the remaining four participants. The random assignment will take place at the end of the first phase of the experiment, such that the choices for the tax and transfer rate in period 2 will take place before knowing the income assigned in period 1.)

Income transition table

In period 2, the positions in the gross income distribution are reassigned according to a transition table. The table does not change the gross income distribution, only the positions among the participants. The transition table specifies

the probability of reaching a certain gross income in period 2 given a certain gross income in period 1. In particular, for each cell of the transition table, the row indicates the income class of period 1 and the column the corresponding income class in period 2.

In the experiment, there will be two transition tables that can be applied to the gross income distribution in period 1 for two different participant reassignments of income classes in period 2. The figure below exemplifies a screenshot similar to what you will find in the experiment.

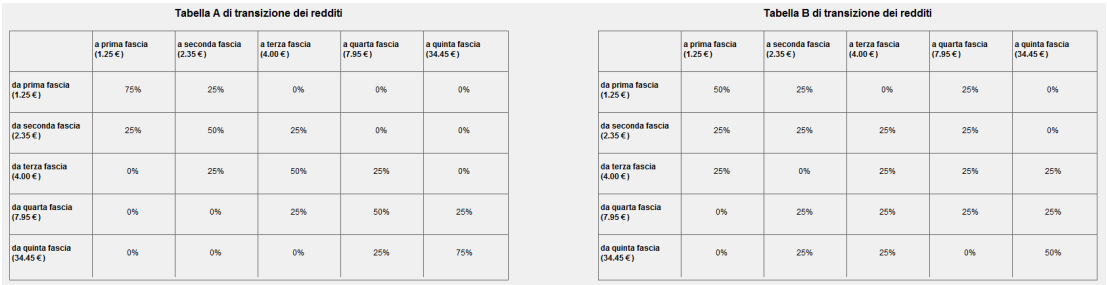


Tabella A di transizione dei redditi

	a prima fascia (1.25 €)	a seconda fascia (2.35 €)	a terza fascia (4.00 €)	a quarta fascia (7.95 €)	a quinta fascia (34.45 €)
da prima fascia (1.25 €)	75%	25%	0%	0%	0%
da seconda fascia (2.35 €)	25%	50%	25%	0%	0%
da terza fascia (4.00 €)	0%	25%	50%	25%	0%
da quarta fascia (7.95 €)	0%	0%	25%	50%	25%
da quinta fascia (34.45 €)	0%	0%	0%	25%	75%

Tabella B di transizione dei redditi

	a prima fascia (1.25 €)	a seconda fascia (2.35 €)	a terza fascia (4.00 €)	a quarta fascia (7.95 €)	a quinta fascia (34.45 €)
da prima fascia (1.25 €)	50%	25%	0%	25%	0%
da seconda fascia (2.35 €)	25%	25%	25%	25%	0%
da terza fascia (4.00 €)	25%	0%	25%	25%	25%
da quarta fascia (7.95 €)	0%	25%	25%	25%	25%
da quinta fascia (34.45 €)	0%	25%	25%	0%	50%

To make an example for table A, assume a participant with gross income of 2.35 € in period 1 corresponding to the second class. In period 2, her or his gross income will be 2.35 € with 50% probability (see below), 1.25 € with 25% probability, 4.00 € with 25% probability, 7.95 € with 0% probability, and 34.45 € with 0% probability. Instead, to exemplify table B, let us assume a participant with a period-1 gross-income of 34.45 €, in period 2, her gross income will be 1.25 € with probability 0% (see below), 2.35 € with probability 25%, € 4.00 with 25% probability, € 7.95 with 0% probability, and € 34.45 with 50% probability.

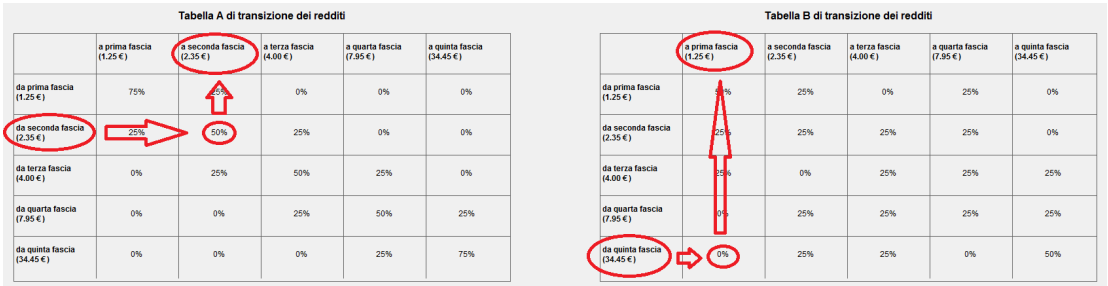


Tabella A di transizione dei redditi

	a prima fascia (1.25 €)	a seconda fascia (2.35 €)	a terza fascia (4.00 €)	a quarta fascia (7.95 €)	a quinta fascia (34.45 €)
da prima fascia (1.25 €)	75%	25%	0%	0%	0%
da seconda fascia (2.35 €)	25%	50%	25%	0%	0%
da terza fascia (4.00 €)	0%	25%	50%	25%	0%
da quarta fascia (7.95 €)	0%	0%	25%	50%	25%
da quinta fascia (34.45 €)	0%	0%	0%	25%	75%

Tabella B di transizione dei redditi

	a prima fascia (1.25 €)	a seconda fascia (2.35 €)	a terza fascia (4.00 €)	a quarta fascia (7.95 €)	a quinta fascia (34.45 €)
da prima fascia (1.25 €)	50%	25%	0%	25%	0%
da seconda fascia (2.35 €)	25%	25%	25%	25%	0%
da terza fascia (4.00 €)	25%	0%	25%	25%	25%
da quarta fascia (7.95 €)	0%	25%	25%	25%	25%
da quinta fascia (34.45 €)	0%	25%	25%	0%	50%

Remember that the transition table does not change the gross income of the five classes nor their distribution, but only the reassignment of participants to the five income classes between period 1 and period 2.

Taxes and transfers

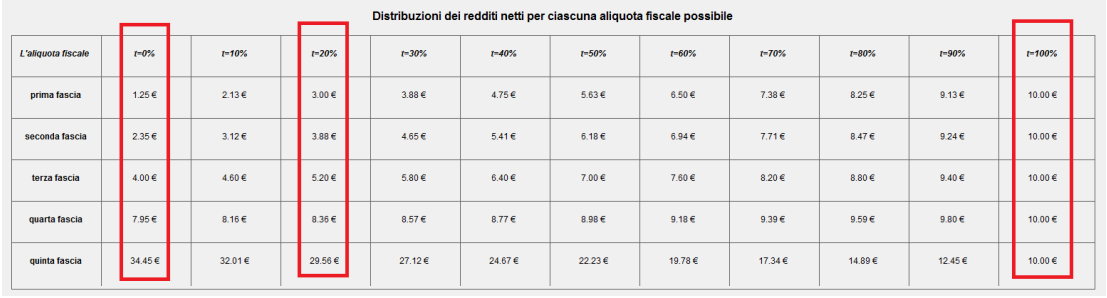
We will now describe how taxes and transfers transform the gross income distribution into net incomes. First, each participant's gross income is taxed at a proportional tax rate t. The rate may vary between 0% and 100% in increments of 10%. Second, the collected taxes are redistributed equally among all the participants; each participant will thus receive an identical amount, independent of what she or he personally contributed. (The appendix contains the precise formula for determining net income based on a given tax rate). The typical choice that each participant must make is therefore to choose the tax rate t to be applied proportionally to all gross incomes, the proceeds of which will be distributed equally among all participants. To facilitate the choice, a table similar to the following shows all possible tax rates from 0% to 100% in increments of 10%, which applied to the gross income distribution generate net incomes.

Distribuzioni dei redditi netti per ciascuna aliquota fiscale possibile

L'aliquota fiscale	*t=0%*	*t=10%*	*t=20%*	*t=30%*	*t=40%*	*t=50%*	*t=60%*	*t=70%*	*t=80%*	*t=90%*	*t=100%*
prima fascia	1.25 €	2.13 €	3.00 €	3.88 €	4.75 €	5.63 €	6.50 €	7.38 €	8.25 €	9.13 €	10.00 €
seconda fascia	2.35 €	3.12 €	3.88 €	4.65 €	5.41 €	6.18 €	6.94 €	7.71 €	8.47 €	9.24 €	10.00 €
terza fascia	4.00 €	4.60 €	5.20 €	5.80 €	6.40 €	7.00 €	7.60 €	8.20 €	8.80 €	9.40 €	10.00 €
quarta fascia	7.95 €	8.16 €	8.36 €	8.57 €	8.77 €	8.98 €	9.18 €	9.39 €	9.59 €	9.80 €	10.00 €
quinta fascia	34.45 €	32.01 €	29.56 €	27.12 €	24.67 €	22.23 €	19.78 €	17.34 €	14.89 €	12.45 €	10.00 €

For example, if the tax rate is t = 0%, then no tax is collected, therefore each participant earns exactly her or his gross income of period 2 (see below). E.g. t = 20% implies that 20% of each participant's gross income in period 2 will be divided among all participants and each person will receive an equal share of the tax revenues plus the remaining 80% of his or her gross income in period 2 (see below). If t = 100%, each participant will contribute 100% of her period 2 gross income into the tax fund, and all will then receive an identical net income (see below) equal to 10.00 €.
The choice for tax rate t must be made for each of the two transition tables presented in the experiment.

At the end of the experiment, one of the two transition tables will be randomly selected by the computer. The tax rate for that table indicated by a participant randomly drawn by the computer determines the net incomes in



Distribuzioni dei redditi netti per ciascuna aliquota fiscale possibile

L'aliquota fiscale	t=0%	t=10%	t=20%	t=30%	t=40%	t=50%	t=60%	t=70%	t=80%	t=90%	t=100%
prima fascia	1.25 €	2.13 €	3.00 €	3.88 €	4.75 €	5.63 €	6.50 €	7.38 €	8.25 €	9.13 €	10.00 €
seconda fascia	2.35 €	3.12 €	3.88 €	4.65 €	5.41 €	6.18 €	6.94 €	7.71 €	8.47 €	9.24 €	10.00 €
terza fascia	4.00 €	4.60 €	5.20 €	5.80 €	6.40 €	7.00 €	7.60 €	8.20 €	8.80 €	9.40 €	10.00 €
quarta fascia	7.95 €	8.16 €	8.36 €	8.57 €	8.77 €	8.98 €	9.18 €	9.39 €	9.59 €	9.80 €	10.00 €
quinta fascia	34.45 €	32.01 €	29.56 €	27.12 €	24.67 €	22.23 €	19.78 €	17.34 €	14.89 €	12.45 €	10.00 €

period 2 which are paid to the participants in case this phase of the experiment is chosen for payment.

Since your stated tax rates for each table can be the one drawn, it is in your own interest to think properly about your choices and report them in the experiment as accurately as possible. The identity of the drawn individual will not be made public during or after the experiment, nor will you be informed if you were the selected subject.

We have reached the end of the instructions for the first phase. To verify your understanding of the transition table please fill in the test table in the next window. (Your answers in the test table have no effect on your earnings.) Upon completion, we ask you to answer a few comprehension questions to make sure that you understand the general instructions of phase 1.

Finally, we invite you to ask for clarification of the instructions in case of any doubts. After all questions are answered, the experiment can begin.

Appendix

The formula to determine the participants' net income given a certain tax rate is the one below. In the formula X_i represents the gross income of participant i in period 2; Y_i is her net income in period 2 (after taxation and transfers), and t the tax rate.

$$Y_i = X_i - tX_i + \frac{1}{20} t \sum_{h=1}^{20} X_h$$

B Non-parametric tests

This Appendix reports results from non-parametric tests. In the tables below we use acronyms for the 16 treatments constructed as follows: the first digit takes on U/C for uncertainty (Phase 1)/certainty (Phase 2) of initial positions; the second R/E for random/effort income assignment; the third LM/HM for low/high mobility; and the fourth CH/ZA for Switzerland (low inequality) / South Africa (high inequality). For example, U_R_LM_CH stands for the treatment with uncertain income position (Phase 1), random income assignment, low mobility and low inequality (Switzerland); and so forth.

Table B1 documents evidence from unmatched Mann-Whitney-Wilcoxon tests conducted to check for potential sessions effects. Recall that we ran two separate sessions with 20 participants for each treatment. The tests show that for all but three treatments tax choices stated by the participants of the two sessions in each treatment can be considered as drawn from the same distribution. The three exceptions are: the high mobility condition in Phase 1 (uncertainty of initial positions) of the ZA-random and the CH-effort treatments; and the high mobility condition in Phase 2 (certainty) of the ZA-random treatment. Further, we have tested for robustness of the regression results reported in the text (Tables 6, 7 and 8) by including alternatively only one of the two sessions of each treatment condition and confirm that results are robust to the sessions included. We have also controlled for specific effects, e.g. gender, between each session pair, but did not find any irregularity.

Table B1: Unmatched Mann-Whitney-Wilcoxon rank-sum tests

Session effects

	z	p		z	p
U_R_LM_CH	-1.469	0.142	C_R_LM_CH	-0.509	0.611
U_R_HM_CH	-1.590	0.112	C_R_HM_CH	-0.478	0.633
U_R_HM_ZA	1.150	0.250	C_R_LM_ZA	0.999	0.318
U_R_HM_ZA	1.715	0.086*	C_R_HM_ZA	2.143	0.032**
U_E_LM_CH	0.136	0.891	C_E_LM_CH	1.288	0.227
U_E_HM_CH	2.081	0.037**	C_E_HM_CH	0.873	0.383
U_E_LM_ZA	0.438	0.661	C_E_LM_ZA	0.029	0.977
U_E_HM_ZA	0.861	0.390	C_E_HM_ZA	-0.195	0.845

* p < 0.1, ** p < 0.05, *** p < 0.01.

Table B2 shows the results of one-sample Kolmogorov-Smirnov tests for the null hypothesis that the distributions of participants' choices in each experi-

mental treatment can be considered as drawn uniformly. The test is based on the statistic $D = \sup_x \|F_0(x) - F_{data}(x)\|$ where $F_0(x)$ is the hypothesized distribution and $F_{data}(x)$ the empirical distribution function of the observed data. Since subjects chose tax rates from the discrete value set $\{0, 0.1, ..., 1\}$ we have used the statistic D for discrete uniform distributions (Arnold and Emerson, 2011).[26] As discussed in the text, the tests indicate that empirical distributions in Phase 1 are mostly consistent with the uniform distribution. Instead, very high p values reject the null distribution in all ZA treatments of Phase 2.

Table B2: One-sample Kolmogorov-Smirnov test for discrete distributions

	D	p		D	p
U_R_LM_CH	0.182	0.142	C_R_LM_CH	0.243	0.017**
U_R_HM_CH	0.205	0.070*	C_R_HM_CH	0.143	0.385
U_R_HM_ZA	0.139	0.425	C_R_LM_ZA	0.259	0.009***
U_R_HM_ZA	0.189	0.116	C_R_HM_ZA	0.255	0.011***
U_E_LM_CH	0.179	0.152	C_E_LM_CH	0.159	0.263
U_E_HM_CH	0.129	0.513	C_E_HM_CH	0.114	0.679
U_E_LM_ZA	0.230	0.030**	C_E_LM_ZA	0.409	0.000***
U_E_HM_ZA	0.238	0.021**	C_E_HM_ZA	0.342	0.000***

* p < 0.1, ** p < 0.05, *** p < 0.01.

Table B3 reports matched Wilcoxon signed-rank tests for the within-subjects treatments, that is Uncertainty (Phase 1) versus Certainty (Phase 2) of initial positions and Low vs High mobility; while Table B4 reports unmatched Mann-Whitney-Wilcoxon rank-sum tests for the between-subjects treatments, i.e. CH vs ZA and random versus effort income assignments. (In the tables the star $*$ in the digit position of the acronyms indicates the testing condition: for example, $*$ in the first position refers to the test of uncertainty vs certainty). Overall the tests confirm the main visual impacts discussed in Section 4.1. They support principally the results that the ZA treatments are most affected by the experimental conditions: first of all the difference between Phase 1 and Phase 2; then the difference with respect to the CH effort treatments in Phase 2; and also the positive effect in the ZA effort treatments of Phase 1 with respect to the high vs low mobility control. Regarding the latter low vs high mobility tests, it is also

[26] In the most standard Kolmogorov-Smirnov test the distribution $F_0(x)$ is continuous, so that the distribution of D does not depend on the hypothesized distribution. In case of discrete null distributions, the distribution of D depends on the null model and is much more difficult to obtain. Nevertheless, methodologies exist to compute the statistics also in the discrete cases. The tests reported here are based on the methodology proposed by Arnold and Emerson (2011).

worthwhile pointing out that whereas the ZA effort condition of Phase 1 is the only treatment exhibiting a significantly negative effect, all but one of the individual tests report a negative sign. This is contrary to the POUM hypothesis. In fact, we add that the Wilcoxon test conducted on the whole treatments show an overall negative effect against the POUM ($z = -2.238$, $p = 0.025$).

Table B3: Matched Wilcoxon signed-rank tests

Uncertainty vs. Certainty			Low mobility vs. High mobility		
	z	p		z	p
*_R_LM_CH	-0.401	0.688	U_R_*_CH	0.839	0.401
*_R_HM_CH	-1.245	0.213	U_R_*_ZA	-1.425	0.154
*_R_LM_ZA	-2.415	0.015**	U_E_*_CH	-0.251	0.802
*_R_HM_ZA	-3.638	0.003***	U_E_*_ZA	-2.910	0.004***
*_E_LM_CH	-0.122	0.906	C_R_*_CH	-0.271	0.787
*_E_HM_CH	-1.070	0.284	C_R_*_ZA	-0.512	0.608
*_R_LM_ZA	-3.162	0.002***	C_E_*_CH	-0.744	0.457
*_R_LM_ZA	-3.244	0.001***	C_E_*_ZA	-1.130	0.258

* p < 0.1, ** p < 0.05, *** p < 0.01.

Table B4: Unmatched Mann-Whitney-Wilcoxon rank-sum tests

Switzerland vs. South Africa			Random vs. Effort		
	z	p		z	p
U_R_LM_*	0.763	0.445	U_*_LM_CH	1.235	0.217
U_R_HM_*	-1.053	0.292	U_*_HM_CH	0.325	0.745
U_E_LM_*	0.044	0.965	U_*_LM_ZA	0.763	0.446
U_E_HM_*	-1.047	0.295	U_*_HM_ZA	0.141	0.888
C_R_LM_*	-0.893	0.372	C_*_LM_CH	1.064	0.287
C_R_HM_*	-1.420	0.156	C_*_HM_CH	0.698	0.485
C_E_LM_*	-2.191	0.029**	C_*_LM_ZA	-0.573	0.567
C_E_HM_*	-2.711	0.006***	C_*_HM_ZA	-0.839	0.401

* p < 0.1, ** p < 0.05, *** p < 0.01.

More generally, Tables B5 and B6 report matched and unmatched tests between treatment and control group of each treatment condition. The tests confirm and provide further qualifications to previous results, in particular about the stronger impact of the experimental treatments in case of high inequality (ZA) than low inequality (CH). In addition to indicate that the difference between the two inequality contexts is more articulated in the certainty (Phase 2) than in the uncertainty (Phase 1) case, the results show that the difference grows also stronger in the effort than in the random treatments, and again rather under certainty than uncertainty of initial positions. All the above re-

sults have also been documented by the regression analyses presented in the paper and summarised in the stated Results 1 and 2.

Table B5: Matched Wilcoxon signed-rank tests (aggregate)

Uncertainty vs. Certainty			Low mobility vs. High mobility		
	z	p		z	p
*_R_	-3.547	0.0004***	U_*_	-1.898	0.057***
*_E_	-3.769	0.0002***	C_*_	-1.233	0.217
*_	-5.159	0.000***	_*_	-2.238	0.025**
*_CH	-1.270	0.204	_R_*	-0.596	0.551
*_ZA	-6.004	0.000***	_E_*	-2.505	0.012**
*_LM	-3.154	0.002***	_*_CH	-0.223	0.823
*_HM	-4.425	0.000***	_*_ZA	-3.179	0.015**
*_R_LM	-1.955	0.051**	U_R_*	-0.321	0.748
*_E_LM	-2.494	0.012**	U_E_*	-2.238	0.025**
*_R_HM	-3.280	0.010***	C_R_*	-0.552	0.581
*_E_HM	-3.007	0.003***	C_E_*	-1.190	0.234
*_R_CH	-1.096	0.273	U_*_CH	0.427	0.669
*_E_CH	-0.699	0.485	U_*_ZA	-3.206	0.001***
*_R_ZA	-4.103	0.000***	C_*_CH	-0.685	0.493
*_E_ZA	-4.496	0.000***	C_*_ZA	-1.156	0.248
*_LM_CH	-0.400	0.689	_R_*_CH	-0.449	0.653
*_HM_CH	-1.616	0.106	_R_*_ZA	-1.363	0.173
*_LM_ZA	-3.925	0.000***	_E_*_CH	-0.792	0.423
*_HM_ZA	-4.740	0.000***	_E_*_ZA	-3.033	0.002***

Table B6: Unmatched Mann-Whitney-Wilcoxon rank-sum tests (aggregate)

Switzerland vs. South Africa			Random vs. Effort		
	z	p		z	p
U_*_	-0.711	0.477	U_*	1.121	0.263
C_*_	-3.502	0.001***	C_*	0.285	0.774
_*_	-2.961	0.003***	_*_	0.967	0.334
R_*_	-1.221	0.222	LM_*_	1.243	0.214
E_*_	-2.928	0.003***	HM_*_	0.100	0.921
LM_*	-1.337	0.181	_*_CH	1.676	0.094*
HM_*	-3.021	0.003***	_*_ZA	-0.373	0.709
U_R_*	-0.212	0.832	U_LM_*	1.486	0.137
U_E_*	-0.763	0.445	U_HM_*	0.146	0.884
C_R_*	-1.580	0.114	C_LM_*	0.348	0.728
C_E_*	-3.368	0.001***	C_HM_*	0.010	0.992
U_LM_*	0.517	0.605	U_*_CH	1.107	0.268
U_HM_*	-1.510	0.131	U_*_ZA	0.550	0.582
C_LM_*	-2.207	0.027**	C_*_CH	1.254	0.210
C_HM_*	-2.907	0.004***	C_*_ZA	-1.010	0.313
_R_LM_*	-0.162	0.871	LM_*_CH	1.653	0.098*
_R_HM_*	-1.666	0.096*	LM_*_ZA	0.060	0.952
_E_LM_*	-1.675	0.094*	HM_*_CH	0.677	0.498
_E_HM_*	-2.575	0.009***	LM_*_ZA	-0.524	0.600

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

C A model of structural preferences (Charness and Rabin, 2002; Durante et al., 2014)

While the identification of a single theory able to explain subjects' choices in the experiment is not the purpose of the paper, it is nevertheless interesting to investigate the extent to which a sufficiently general model on demand for redistribution can fit the data. With similar purpose, Durante et al. (2014) adapt the theory of social preferences by Charness and Rabin (2002) to test their data. We do the same and compare our estimates to those of Durante et al. (2014).

Charness and Rabin (2002) propose a simple theory of social preferences, valid for both strategic games and multiperson situations, in which people's preferences are expressed by a convex combination of selfish and social motivations. In the original theory the selfish motivation represents a person's own expected payoff in a given situation, while the disinterested social component is formed by convex combination of concerns for equity, expressed in the Rawlsian form of interest for the worst-off person in the society, and efficiency. Since redistributive taxation occurs in our experiment at no cost, efficiency marks no issue in our experiment. Durante et al. (2014) extend the model to include risk attitude in the personal motivation. The resulting utility function for a typical subject h relevant in our experiment can be written as:

$$V_h = (1-\lambda)\left[(1-\gamma)\,E[Y] + \gamma(-\sigma_Y)\right] + \lambda Y^{min} \tag{2}$$

where $E[Y]$ and σ_Y denote, respectively, the expectation of own (post-tax) income and its standard deviation; where the term Y^{min} expresses the Rawlsian equity concern for the person with the lowest post-tax income.[27] Thus, according to the model, the structural preference parameters of interest in our experiment are the utility weights λ and γ.

In particular, the model encompasses as special cases the three main criteria of selecting tax rates discussed in the text, namely: I) maximization of expected earnings, occurring when λ and γ equal both zero; II) risk aversion, in the form of a mean-variance utility, when $\lambda = 0$ and $\gamma \in (0, 1)$; and III) inequity aversion

[27] Remark the extra term σ_Y in the utility function with respect to the specification used for Table 4 of the text representing the extension proposed by Durante et al. (2014) to the original Charness and Rabin (2002)'s specification.

(with no risk aversion), when $\lambda \in (0,1)$ and $\gamma = 0$ (the model in Table 4).

To derive the theoretical predictions more formally, let the three terms in the utility function, EY, σ_Y, Y^{min}, be expressed as functions of the tax rate τ, that is:

$$EY = \sum_{j=1}^{5} \pi_{hj} X_j (1-\tau) + \tau \overline{X}, \tag{3}$$

$$\sigma_Y = \sqrt{\sum_{j=1}^{5} \pi_{hj} \left(X_j(1-\tau)\right)^2 - \left[\sum_{j=1}^{5} \pi_{hj} X_j (1-\tau)\right]^2}, \tag{4}$$

$$Y^{min} = X^{min}(1-\tau) + \tau \overline{X}, \tag{5}$$

where, in the three expressions, π_{hj} is the subjective probability of individual h of being in income quintile j before taxation, X_j is the pre-tax income in quintile j, and $\overline{X}$ and X^{min} the mean and the minimum society's pre-tax incomes. Clearly, while $\overline{X} = 10$ in all treatments, the other variables π_{hj}, X_j and X^{min} depend on treatments and subjective probabilities as discussed in the paper.

Using the three expressions in the utility function (2) and taking the derivative with respect to τ, one obtains:

$$\begin{aligned} \frac{\partial V_h}{\partial \tau} \;=\; & (1-\lambda)(1-\gamma)\left[\overline{X} - \sum_{j=1}^{5} \pi_{hj} X_j\right] + \\ & \gamma(1-\lambda)\sqrt{\sum_{j=1}^{5} \pi_{hj} X_j^2 - \left[\sum_{j=1}^{5} \pi_{hj} X_j\right]^2} + \lambda\left[\overline{X} - X^{min}\right] \end{aligned}$$

which delivers the predictions discussed in section 3.3 of the paper when the structural parameters λ and γ satisfy the previous restrictions of at least one of the two parameters equal to 0. More general, both λ and γ can be inside the interval $(0,1)$ indicating that all three motivations play a role in subjects' preferences. Nevertheless, note that since the utility function (2) is linear in the tax rate, the model always predicts corner solutions at $\tau = 0$ or 1, depending on the values of π_{hj}'s, X_j's, etc. in treatments and on the utility parameters λ and γ. In this sense the model can be considered as benchmark limiting case.

Estimation of the structural parameters λ and γ can be obtained following

the method of Durante et al. (2014) based on the conditional logit model of McFadden (1973). The method requires constructing an observation for each subject h in any treatment for each possible tax rate $\tau \in K = \{0, 0.1, ..., 1\}$. It maximizes utility function (2) making random errors, which, under conditions of "type I extreme value" distribution, imply that the probability for subject h choosing a certain tax rate $\tau_h = \tau$, with $\tau \in K$, is given by:

$$P(\tau_h = \tau) = \frac{e^{V_{h\tau}}}{\sum_{k \in K} e^{V_{hk}}}$$

The resulting likelihood function is then maximized to estimate the parameters β_1, β_2 and β_3 in the utility function (2) written as:

$$V_h = \beta_1 EY + \beta_2 \sigma_Y + \beta_3 Y^{min}$$

The estimates of the $\beta_l's$ are finally used to obtain the structural preference parameters of function (2) according to the transformations:

$$\lambda = \frac{\beta_3}{\beta_1 + \beta_2 + \beta_3}; \qquad \gamma = \frac{\beta_2}{\beta_1 + \beta_2}$$

Table D1: Estimation of Charness and Rabin (2002) - Durante et al. (2014) utility

	(1) Phase 1 & Phase 2	(2) Phase 1	(3) Phase 1 Effort	(4) Phase 2	(5) Phase 2 Random	(6) Phase 2 Effort
Expected pers. income (β_1)	0.326***	0.194***	0.244***	0.423***	0.261***	0.610***
	(0.088)	(0.057)	(0.063)	(0.084)	(0.083)	(0.041)
St. dev. of pers. income (β_2)	-0.082***	-0.265***	-0.345***	-0.190***	-0.074***	-0.298***
	(0.240)	(0.010)	(0.014)	(0.050)	(0.099)	(0.489)
Minimum soc. income (β_3)	0.104*	-0.434***	-0.393***	0.131**	0.137*	0.085
	(0.054)	(0.083)	(0.016)	(0.061)	(0.071)	(0.118)
λ	0.203***	-17.461	-1.974***	0.176*	0.290	0.086
	(0.060)	(109.260)	(0.732)	(0.099)	(0.219)	(0.108)
γ	0.201***	0.577***	0.584***	0.309***	0.221	0.329***
	(0.023)	(0.063)	(0.072)	(0.014)	(0.176)	(0.038)
(1-λ)	0.797***	18.461	2.974***	0.824***	0.710***	0.914***
	(0.060)	(109.260)	(0.732)	(0.099)	(0.219)	(0.108)
Cases	640	320	160	280	120	160
Log-pseudolikelihood	-1408.897	-719.404	-361.323	-563.653	-249.211	-302.255

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

The estimates of the model obtained in our experiment are reported in Table D1. They exhibit great variability between treatments of Phase 1 (uncertainty of initial positions) and Phase 2 (certainty). Model (1) pools the data of all experimental treatments. All coefficients show the expected sign: those on personal variables, namely own expected income and standard deviation, are highly statistically significant; the coefficient on the society's minimum income is mildly significant. Models (2) and (3) investigate treatments of Phase 1: model (2) regards all treatments, while model (3) alone the effort treatments. Results for the random treatments of Phase 1 are not reported because the maximization algorithm does not converge when the random treatments data are estimated alone. Nevertheless, results of models (2) and (3) show that the utility specification in equation (2) is unsuitable to explain subjects' behaviour in Phase 1: in particular, parameter β_3 on the society's minimum income exposes a negative sign, contrary to the model predictions. As a consequence, also the utility weights λ and γ of the utility function are outside the predicted domain of $[0, 1]$. Model (4) pools the data for the treatments of Phase 2. All coefficients are highly statistically significant and with the expected signs. Models (5) and (6) separate between the random and the effort treatments of Phase 2. For the former treatments convergence requires not using the data from the Switzerland treatment with low mobility (possibly due to little variation in the data, particularly standard deviation of own incomes). The separate regressions (5) and (6) confirm the predicted signs of the coefficients, even if their significance is generally weaker than in the pooled model (4) because of fewer observations.

Overall, the estimated models in Table D1 indicate that subjects follow very different behavioral rules in Phase 1 and Phase 2 of the experiment, with in particular the tax choices in Phase 1 substantially departing from models including social concern. This is clearly consistent with the evidence summarised in Result 1 (Section 4.1.1). Evidence from Phase 2, on the other hand, shows overall more consistency with the utility model (2). The results from model (4), possibly the most reliable due to the largest number of observations, indicate that subjects place a relative weight on personal motivations about 4.7 times higher as the weight placed on social concern (i.e. $\frac{1-\lambda}{\lambda} = \frac{0.824}{0.176} = 4.68$). Concern for own payoff is clearly affected by risk aversion (ratio of about $\frac{1}{2.4}$ as measured in terms of a negative concern for standard deviation of own payoff relative

to expected value i.e. $\frac{\gamma}{1-\gamma} = \frac{0.309}{0.691}$). Comparisons with analogue figures from Durante et al. (2014) provide some similarities. For example, Table 3, column (2) of Durante et al. (2014), reporting results for the treatments most similar to our ours, find estimates of $\lambda = 0.134$ and $\gamma = 0.110$ which are not too far from ours. Nevertheless, the whole set of regressions reported in their Table 3 also confirm that the structural weights in equation (2) vary substantially between contexts, showing therefore that subjects' choices of the tax rates depend on considerations which go beyond those underlying that utility specification.

References

Agranov, M. and T. R. Palfrey (2015). Equilibrium tax rates and income redistribution: A laboratory study. *Journal of Public Economics 130*, 45–58.

Agranov, M. and T. R. Palfrey (2020). The effects of income mobility and tax persistence on income redistribution and inequality. *European Economic Review 123*, 103372.

Ahmed, F., N. Ahmed, C. Pissarides, and J. Stiglitz (2020). Why inequality could spread covid-19. *The Lancet Public Health*.

Alesina, A. and G.-M. Angeletos (2005). Fairness and redistribution. *American Economic Review 95*(4), 960–980.

Alesina, A. and P. Giuliano (2011). Preferences for redistribution. In M. J. Jess Benhabib, Alberto Bisin (Ed.), *Handbook of Social Economics*, Volume 1, pp. 93–131. Elsevier.

Alesina, A. and E. La Ferrara (2005). Preferences for redistribution in the land of opportunities. *Journal of Public Economics 89*(5-6), 897–931.

Alesina, A., S. Stantcheva, and E. Teso (2018). Intergenerational mobility and preferences for redistribution. *American Economic Review 108*(2), 521–54.

Alvaredo, F., L. Chancel, T. Piketty, E. Saez, and G. Zucman (2018). *World inequality report 2018*. Belknap Press.

Amiel, Y., M. Bernasconi, F. Cowell, and V. Dardanoni (2015). Do we value mobility? *Social Choice and Welfare 44*(2), 231–255.

Arnold, T. B. and J. W. Emerson (2011). Nonparametric goodness-of-fit tests for discrete null distributions. *R Journal 3*(2).

Arrow, K., S. Bowles, and S. Durlauf (2000). *Meritocracy and Economic Inequality*. Princeton University Press.

Ashok, V., I. Kuziemko, and E. Washington (2015). Preferences for redistribution in an era of rising inequality: Some new stylized facts and tentative explanations. *Brookings Papers on Economic Activity (Spring)*, 367–405.

Atkinson, A. B. (1970). On the measurement of inequality. *Journal of Economic Theory 2*(3), 244–263.

Atkinson, A. B. (2015). *Inequality. What Can Be Done?* Harvard University Press.

Balafoutas, L., M. G. Kocher, L. Putterman, and M. Sutter (2013). Equality, equity and incentives: An experiment. *European Economic Review 60*, 32–51.

Bartels, L. M. (2018). *Unequal Democracy: The Political Economy of the New Gilded Age*. Princeton University Press.

Benabou, R. (2000). Unequal societies: Income distribution and the social contract. *American Economic Review 90*(1), 96–129.

Benabou, R. and E. A. Ok (2001, 05). Social mobility and the demand for redistribution: The POUM hypothesis. *The Quarterly Journal of Economics 116*(2), 447–487.

Benabou, R. and J. Tirole (2006). Belief in a just world and redistributive politics. *The Quarterly Journal of Economics 121*(2), 699–746.

Benoît, J.-P., J. Dubra, and D. A. Moore (2015). Does the better-than-average effect show that people are overconfident?: Two experiments. *Journal of the European Economic Association 13*(2), 293–329.

Bernasconi, M. (2002). How should income be divided? Questionnaire evidence from the theory of 'impartial preferences'. *Journal of Economics 77*(1), 163–195.

Bernasconi, M. (2006). Redistributive taxation in democracies: Evidence on people's satisfaction. *European Journal of Political Economy 22*(4), 809–837.

Bolton, G. E. and A. Ockenfels (2000, March). ERC: A theory of equity, reciprocity, and competition. *American Economic Review 90*(1), 166–193.

Bordalo, P., K. Coffman, N. Gennaioli, and A. Shleifer (2019). Beliefs about gender. *American Economic Review 109*(3), 739–73.

Broome, J. (1984). Selecting people randomly. *Ethics 95*(1), 38–55.

Brunnermeier, M. K. and J. A. Parker (2005). Optimal expectations. *American Economic Review 95*(4), 1092–1118.

Bundesamtfür Statistik (2017). Kennzahlen zur verteilung der einkommen vor und nach staatlichen transfers. https://www.bfs.admin.ch/bfs/de/home/statistiken/querschnittsthemen, accessed January 26, 2019.

Cappelen, A. W., A. D. Hole, E. Ø. Sørensen, and B. Tungodden (2007). The pluralism of fairness ideals: An experimental approach. *American Economic Review 97*(3), 818–827.

Cappelen, A. W., K. O. Moene, E. Ø. Sørensen, and B. Tungodden (2013). Needs versus entitlements. An international fairness experiment. *Journal of the European Economic Association 11*(3), 574–598.

Charité, J., R. Fisman, and I. Kuziemko (2015). Reference points and redistributive preferences: Experimental evidence. *NBER Working Paper No. 21009*.

Charness, G. and M. Rabin (2002). Understanding social preferences with simple tests. *The Quarterly Journal of Economics 117*(3), 817–869.

Charness, G., A. Rustichini, and J. Van de Ven (2018). Self-confidence and strategic behavior. *Experimental Economics 21*(1), 72–98.

Checchi, D. and A. Filippin (2004). An Experimental Study of the POUM Hypothesis. *Research on Economic Inequality 11*, 115–136.

Cheng, S. and F. Wen (2019). Americans overestimate the intergenerational persistence in income ranks. *Proceedings of the National Academy of Sciences 116*(28), 13909–13914.

Cheung, S. L. and L. Johnstone (2017). True overconfidence, revealed through actions: An experiment. *IZA Discussion Paper No. 10545*.

Cojocaru, A. (2014). Prospects of upward mobility and preferences for redistribution: Evidence from the life in transition survey. *European Journal of Political Economy 34*, 300–314.

Corneo, G. and F. Neher (2015). Democratic redistribution and rule of the majority. *European Journal of Political Economy 40*, 96–109.

Cowell, F. A. and E. Schokkaert (2001). Risk perceptions and distributional judgments. *European Economic Review 45*(4-6), 941–952.

Cruces, G., R. Perez-Truglia, and M. Tetaz (2013). Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment. *Journal of Public Economics 98*, 100 – 112.

Davidai, S. and T. Gilovich (2015). Building a more mobile America — One income quintile at a time. *Perspectives on Psychological Science 10*(1), 60–71.

De Bondt, W. F. and R. H. Thaler (1995). Financial decision-making in markets and firms: A behavioral perspective. In V. M. R. A. Jarrow and W. T. Ziemba. (Eds.), *Handbooks in Operations Research and Management Science*, Volume 9, pp. 385–410. Elsevier.

DellaVigna, S. (2009). Psychology and economics: Evidence from the field. *Journal of Economic literature 47*(2), 315–72.

Diamond, P. A. et al. (1967). Cardinal welfare, individualistic ethics, and interpersonal comparison of utility: Comment. *The Journal of Political Economy 75*(5), 765.

Downs, A. (1957). *An Economic Theory of Democracy*. Harper: New York.

Durante, R., L. Putterman, and J. van der Weele (2014, 08). Preferences for redistribution and perception of fairness: An experimental study. *Journal of the European Economic Association 12*(4), 1059–1086.

Erkal, N., L. Gangadharan, and N. Nikiforakis (2011). Relative earnings and giving in a real-effort experiment. *American Economic Review 101*(7), 3330–48.

Esarey, J., T. C. Salmon, and C. Barrilleaux (2012). What motivates political preferences? Self-Interest, ideology, and fairness in a laboratory democracy. *Economic Inquiry 50*(3), 604–624.

Fang, H., D. Shapiro, and A. Zillante (2016). An experimental study of alternative campaign finance systems: Transparency, donations, and policy choices. *Economic Inquiry 54*(1), 485–507.

Fehr, E. and K. M. Schmidt (1999). A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics 114*(3), 817–868.

Fields, G. S. and E. A. Ok (1999). The measurement of income mobility: an introduction to the literature. In *Handbook of Income Inequality Measurement*, pp. 557–598. Springer.

Finn, A. and M. Leibbrandt (2013). Mobility and inequality in the first three waves of nids. *NIDS Discussion Paper 120*.

Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics 10*(2), 171–178.

Fong, C. (2001). Social preferences, self-interest, and the demand for redistribution. *Journal of Public Economics 82*(2), 225–246.

Gaertner, W. and E. Schokkaert (2012). *Empirical Social Choice: Questionnaire-Experimental Studies on Distributive Justice*. Cambridge University Press.

Gee, L. K., M. Migueis, and S. Parsa (2017). Redistributive choices and increasing income inequality: Experimental evidence for income as a signal of deservingness. *Experimental Economics 20*(4), 894–923.

Gill, D. and V. Prowse (2012). A structural analysis of disappointment aversion in a real effort competition. *American Economic Review 102*(1), 469–503.

Gill, D. and V. Prowse (2019). Measuring costly effort using the slider task. *Journal of Behavioral and Experimental Finance 21*, 1–9.

Greiner, B. (2015). Subject pool recruitment procedures: Organizing experiments with ORSEE. *Journal of the Economic Science Association 1*(1), 114–125.

Großer, J. and E. Reuben (2013). Redistribution and market efficiency: An experimental study. *Journal of Public Economics 101*, 39–52.

Harms, P. and S. Zink (2003). Limits to redistribution in a democracy: A survey. *European Journal of Political Economy 19*(4), 651 – 668.

Harsanyi, J. C. (1955). Cardinal welfare, individualistic ethics, and interpersonal comparisons of utility. *Journal of Political Economy 63*(4), 309–321.

Harsanyi, J. C. (1977). *Rational Behavior and Bargaining Equilibrium in Games and Social Situations*. Cambridge: Cambridge University Press.

Hauser, O. P. and M. I. Norton (2017). (Mis)perceptions of inequality. *Current Opinion in Psychology 18*, 21 – 25.

Heger, S. A. and N. W. Papageorge (2018). We should totally open a restaurant: How optimism and overconfidence affect beliefs. *Journal of Economic Psychology 67*, 177–190.

Höchtl, W., R. Sausgruber, and J.-R. Tyran (2012). Inequality aversion and voting on redistribution. *European Economic Review 56*(7), 1406–1421.

Jantti, M., B. Bratsberg, K. Roed, O. Raaum, R. Naylor, E. Osterbacka, A. Bjorklund, and T. Eriksson (2006). American exceptionalism in a new light: a comparison of intergenerational earnings mobility in the nordic countries, the united kingdom and the united states.

Jäntti, M. and S. P. Jenkins (2015). Income mobility. In A. B. Atkinson and F. Bourguignon (Eds.), *Handbook of Income Distribution*, Volume 2, pp. 807–935. Elsevier.

Jiménez-Jiménez, N., E. Molis, and Á. Solano-García (2018). The effect of initial inequality on meritocracy: A voting experiment on tax redistribution. *Journal of Economic Behavior & Organization In press.*

Jimenez Jimenez, N., E. Molis, and A. Solano-García (2019). Why do the poor vote for low tax rates? A (real-effort task) experiment on income redistribution. *Available at SSRN: https://ssrn.com/abstract=3485548*.

Karadja, M., J. Mollerstrom, and D. Seim (2017). Richer (and holier) than thou? The effect of relative income improvements on demand for redistribution. *Review of Economics and Statistics 99*(2), 201–212.

Kesternich, M., A. Lange, and B. Sturm (2018). On the performance of rule-based contribution schemes under endowment heterogeneity. *Experimental Economics 21*(1), 180–204.

Konrad, K. A. and F. Morath (2010). Social mobility and redistributive taxation. *WZB Markets and Politics Working Paper No. SP II 15*.

Köszegi, B. (2006). Ego utility, overconfidence, and task choice. *Journal of the European Economic Association 4*(4), 673–707.

Kraus, M. W. and J. J. Tan (2015). Americans overestimate social class mobility. *Journal of Experimental Social Psychology 58*, 101–111.

Krawczyk, M. (2010). A glimpse through the veil of ignorance: Equality of opportunity and support for redistribution. *Journal of Public Economics 94*(1-2), 131–141.

Ku, H. and T. C. Salmon (2013). Procedural fairness and the tolerance for income inequality. *European Economic Review 64*, 111–128.

Laméris, M. D., H. Garretsen, and R. Jong-A-Pin (2020). Political ideology and the intragenerational prospect of upward mobility. *European Journal of Political Economy 62*, 101854.

Lefgren, L. J., D. P. Sims, and O. B. Stoddard (2016). Effort, luck, and voting for redistribution. *Journal of Public Economics 143*, 89–97.

Logg, J. M., U. Haran, and D. A. Moore (2018). Is overconfidence a motivated bias? Experimental evidence. *Journal of Experimental Psychology: General 147*(10), 1445.

Luttmer, E. F. and M. Singhal (2011). Culture, context, and the taste for redistribution. *American Economic Journal: Economic Policy 3*(1), 157–79.

McFadden, D. (1973). Conditional logit analysis of qualitative choice behavior. In P. Zarembka (Ed.), *Frontiers in Econometrics*, Volume 1, pp. 105–142. Academic press.

Meltzer, A. H. and S. F. Richard (1981). A rational theory of the size of government. *Journal of Political Economy 89*(5), 914–927.

Moore, D. A. and P. J. Healy (2008). The trouble with overconfidence. *Psychological Review 115*(2), 502.

Norton, M. I. and D. Ariely (2011). Building a better America — One wealth quintile at a time. *Perspectives on Psychological Science 6*(1), 9–12. PMID: 26162108.

Paetzel, F., J. Lorenz, and M. Tepe (2018). Transparency diminishes framing-effects in voting on redistribution: Some experimental evidence. *European Journal of Political Economy 55*, 169–184.

Piketty, T. (1995). Social mobility and redistributive politics. *The Quarterly Journal of Economics 110*(3), 551–584.

Piketty, T. (2014). *Capital in the 21st Century*. Harvard University Press.

Rawls, J. (1971). *A Theory of Justice*. Harvard University Press.

Roemer, J. E. (1998). Why the poor do not expropriate the rich: an old argument in new garb. *Journal of Public Economics 70*(3), 399–424.

Ryvkin, D. and A. Semykina (2017). An experimental study of democracy breakdown, income and inequality. *Experimental Economics 20*(2), 420–447.

Sausgruber, R., A. Sonntag, and J.-R. Tyran (2019). Disincentives from redistribution: Evidence on a dividend of democracy. *WU International Taxation Research Paper Series No. 2019-05*.

Schildberg-Hörisch, H. (2010). Is the veil of ignorance only a concept about risk? An experiment. *Journal of Public Economics 94*(11-12), 1062–1066.

Schwardmann, P. and J. Van der Weele (2019). Deception and self-deception. *Nature Human Behaviour 3*(10), 1055–1061.

Sen, A. K. (1970). *Collective Choice and Social Welfare*. San Francisco: Holden-Day.

Sinn, H.-W. (1996). Social insurance, incentives and risk taking. *International Tax and Public Finance 3*(3), 259–280.

Stiglitz, J. E. (2016). Inequality and economic growth. In M. Jacobs and M. Mazzucato (Eds.), *Rethinking Capitalism: Economics and Policy for Sustainable and Inclusive Growth*, pp. 134–155. Wiley Blackwell.

Swan, L. K., J. R. Chambers, M. Heesacker, and S. S. Nero (2017). How should we measure Americans' perceptions of socio-economic mobility? *Judgment and Decision making 12*(5), 507.

Tyran, J.-R. and R. Sausgruber (2006). A little fairness may induce a lot of redistribution in democracy. *European Economic Review 50*(2), 469–485.

Wilkinson, R. G. and K. E. Pickett (2017). The enemy between us: The psychological and social costs of inequality. *European Journal of Social Psychology 47*(1), 11–24.

World Bank (2014). Income shares. https://data.worldbank.org/, accessed January 26, 2019.

Young, M. D. (1958). *The Rise of the Meritocracy*. Thames & Hudson.