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Equal Opportunities for All?
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by

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Equal Opportunities for All?

How Income Redistribution Promotes Support for Economic Inclusion

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Abstract

We experimentally investigate how income redistribution shapes support for economic inclusion, i.e., a policy that creates equality of opportunity for income generation. We study a setting in which low-endowment subjects are excluded from investment opportunities unless those with high endowments transfer resources to the low-endowment subjects. We find that support for economic inclusion is stronger among high-endowment subjects if incomes are known to be redistributed in the future compared to a situation in which this is precluded by design. Income redistribution spreads both risks and returns of investments in the population which, in turn, induces a higher rate of profitable investments, and this prospect tends to foster support for economic inclusion. Income redistribution thus induces more equal and efficient outcomes by boosting popular support for economic inclusion.

Keywords laboratory experiment; income redistribution; economic inclusion; equality of opportunity; investment; risk taking

JEL C91; D31; D63; D81

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1. Introduction

This paper studies popular support for economic inclusion, i.e., a policy that equalizes opportunities for income generation, and asks how such support is shaped by the prospect of future income redistribution. Economic inclusion creates "economic opportunities to previously under-served social groups" by providing them with access to the labor market, investment opportunities and entrepreneurship (European Bank for Reconstruction and Development 2017: 5). Understanding the drivers of inequality of opportunity is highly relevant because it prevents the poor from building (human) capital and is, in consequence, harmful for growth (Aghion, Caroli, and Garcia-Penalosa 1999; Galor and Moav 2004).

Economic inclusion is desirable on fairness grounds but it may also benefit society as a whole by allocating resources in a more efficient way. Whether this is the case depends on whether the included make good use of their newly won opportunities, and whether those who have to bear the cost of economic inclusion are confident that this will be the case. The reason why such beliefs matter is that the cost of economic inclusion policies have to be borne by those who are already better off, i.e., the economically included, but its benefits are uncertain and delayed. Voters facing immediate and certain cost may fail to support economic inclusion policies that promise only uncertain and remote benefits.

Income redistribution policies might, however, induce support for economic inclusion policies. The reason is that redistribution of income tomorrow spreads risks and returns of investment choices today. Investment is costly and risky to investors, and they may be reluctant to invest for fear of wasting their money. Future income redistribution may mitigate this reluctance by providing a safety net. If it does, and the newly included are encouraged to invest in risky but on average profitable activities, this benefits both the newly included and those who had to finance the inclusion (through future income redistribution). Income redistribution may thus encourage profitable investments and, if these effects are anticipated, also boost support for economic inclusion. However, income redistribution is not a guaranteed remedy. The already included may oppose financing economic inclusion even if income is redistributed in the future if the currently excluded (are believed to) fail to invest.

To fix ideas, think of access to education. Suppose there are two groups in society, the well-off who can afford to pay the fees charged by high-quality educational institutions, and the poor who cannot. Access to such education improves the chances of getting a well-paid job later on. Providing the poor with access to such educational opportunities requires funding by the well-off (e.g., through an increase in tuition fees or higher taxes). Whether broader access to higher education leads to higher overall incomes depends, among other factors, on whether the poor make good use of their newly won educational opportunities. This is not guaranteed since going to school is costly to students (in terms of money and time invested), and there is no guarantee that their efforts today are compensated by

higher incomes in the future. Therefore, some of the poor might choose not to attend school for fear of wasting their time and money. Income redistribution from those with well-paying jobs to those with low-paying jobs spreads the risk of receiving a low income after investing in education. This safety net might encourage a larger share of people to invest in quality education and, in turn, increase collective income.[2] And this additional income can, in turn, be redistributed back to those who funded the access to education. Income redistribution policies might therefore facilitate support for economic inclusion policies.

The core of our experiment is a one-shot game played in pairs. It has three stages. In stage 1, subjects receive unequal endowments that can be invested in stage 2. They have the choice between a relatively safe option with a low return and a more risky option with a high return. The low endowment is, however, insufficient to cover the cost of investing in the more profitable option. That is, some subjects have the opportunity to invest in the profitable option, some do not. Before making their investment choice in stage 2, subjects vote in stage 1 on whether to implement economic inclusion. If the policy is accepted, endowments are equalized such that both subjects have access to the more profitable investment option. At the end of stage 2, subjects learn whether their investment yielded a high or a low return. In stage 3, income may be redistributed. Whether this is the case, depends on the treatment. In treatment *RED*, subjects know (from the start) that income after investment is redistributed in stage 3 with certainty, while income is known not to be redistributed in treatment *NoRED*. In treatment *EndoRED*, income redistribution is determined in a vote (in stage 3), and hence uncertain at the time when the choice about economic inclusion is made. Controlled treatment variation (*NoRED*, *EndoRED*, *RED*) allows us to investigate how different income redistribution schemes (in stage 3) shape support for economic inclusion (in stage 1). Income redistribution spreads the risks and returns of investment in the population, and the presence of redistribution in stage 3 thus provides a safety net (insurance) that might encourage people to make more risky choices; choices that people would not dare to or could not make otherwise, for example due to risk-aversion or credit-constraints (Bénabou 2000; Saint-Paul and Verdier 1993).

Our results show that future income redistribution indeed increases efficiency (measured by overall incomes). This effect operates through two channels. First, income redistribution stimulates support for economic inclusion, which provides more subjects with access to the more profitable investment option. Second, given access to the more profitable option, the safety net provided by income redistribution encourages subjects to actually invest in this option (similar to, e.g., Barr and Genicot 2008; Fischer 2013). As a consequence, groups that accept economic inclusion policies reach a higher

[2] This reasoning applies if moral hazard is moderate (people dare to acquire profitable education) rather than excessive (people overqualify to an extent which is harmful for overall efficiency). See the concluding section for a more detailed discussion.

overall income with redistribution (in *RED*) than without (*NoRED*). We find that the same chain of effects holds, albeit weaker, if income redistribution is uncertain (treatment *EndoRED*).

Our paper contributes to a slim experimental literature investigating the relation of unequal access to opportunity and income redistribution (e.g., Akbaş, Ariely, and Yuksel 2019; Eisenkopf, Fischbacher, and Föllmi-Heusi 2013; Krawczyk 2010). However, previous studies have focused on how unequal opportunities of income generation shape the willingness to redistribute income while we are, to the best of our knowledge, the first to study the converse (see section 2 for a discussion).

We believe our study contributes to a better understanding of the mechanisms through which income redistribution not only contributes to fairness through a more equal distribution of income, but indirectly also facilitates economic inclusion and, under the right conditions, boosts efficiency. Since we are the first to study this mechanism, we deliberately choose a simple and stylized setting in which redistribution has the potential to be efficiency-improving. In our setting, redistribution is not costly (it comes without administrative costs or disincentive effects), it does not induce excessive risk-taking (in our setting the more risky option is also the more profitable one), and alternatives to redistribution are not feasible (subjects are credit constrained, i.e., cannot borrow against future earnings). We sketch avenues to investigate situations involving such complicating factors in the concluding section.

The paper proceeds as follows: section 2 provides an overview of the previous literature, section 3 outlines the experimental design and section 4 the predictions and hypotheses. Section 5 presents the results, section 6 provides a summary and discussion.

2. Previous Research

Oxoby (2009) notes that the expression "economic inclusion" is mostly used with an emphasis on (unequal) access to rights and resources as well as the existence of barriers. For example, the European Bank for Reconstruction and Development (EBRD) states that economic inclusion "is based on the concept of equality of opportunity and focuses on groups that experience disproportionate barriers to economic opportunity due to circumstances outside of their control" (EBRD 2017: 5).

The literature on equality of opportunity distinguishes between an ex-ante and an ex-post approach. According to the ex-ante approach, equality of opportunity prevails if all individuals face the same set of opportunities irrespective of exogenous circumstances ("equality between types"). According to the ex-post approach, equality of opportunity implies that all individuals who invest the same effort receive the same outcome ("equality between responsibility classes", see Checchi, Peragine, and Serlenga 2016; Fleurbaey and Peragine 2013). In our experiment, we follow the ex-ante approach: each group consists of two types with unequal endowments and, as a consequence, types face different investment opportunities or choice sets. If endowments are not equalized (i.e., when there is no

economic inclusion), one type has insufficient funds to invest in the more profitable option and, as a consequence, will most likely end up with a lower income. Our study is one of few that take an ex-ante perspective while most previous experimental studies take the initial distribution of opportunities as given (as Akbaş, Ariely, and Yuksel 2019; Eisenkopf, Fischbacher, and Föllmi-Heusi 2013; Krawczyk 2010). To the best of our knowledge, only two other experimental studies allow subjects to redistribute opportunities ex-ante (Brock, Lange, and Ozbay 2013; Michal Krawczyk and Le Lec 2010), but they do so in a simpler setting (risky dictator games) in which no further redistribution of income ex-post is possible. Hence, these studies cannot investigate how income redistribution shapes support for economic inclusion, as we do (for a detailed comparison of these studies and our study see below).

A pervasive (and perhaps unsurprising) finding in the literature is that attitudes towards redistribution are shaped in important ways by fairness considerations. People tend to express different redistributive preferences conditional on (their beliefs about) the underlying sources of economic success and how fair they consider the resulting income distribution. Those who believe that hard work and the willingness to take risks determine one's success in life tend to be less in favor of redistribution than those who believe that getting ahead in life is a matter of luck and connections (Fong, Bowles, and Gintis 2005; Alesina and La Ferrara 2005; Alesina and Angeletos 2005). People seem to distinguish between factors for which they hold others responsible and factors beyond individual control. Recent experimental studies confirm that support for income redistribution differs much conditional on whether the primary distribution is mainly due to luck or effort (Cappelen et al. 2013; Jiménez-Jiménez, Molis, and Solano-García 2020; Durante, Putterman, and van der Weele 2014).[3]

Popular support for income redistribution is also shaped by the beliefs about whether initial opportunities for income generation have been distributed equally or not. Several survey studies found that those who believe that everybody has a fair chance to get an education and get ahead in life tend to be less supportive of redistribution than those who believe that opportunities are distributed unequally (e.g., Alesina and La Ferrara 2005; Fong, Bowles, and Gintis 2005).

Experimental studies directly addressing (in-)equality of opportunity are scarce and arrive at mixed conclusions. A close match to our study is Akbaş, Ariely, and Yuksel (henceforth AAY 2019). These authors also study a two-person game and ask subjects (either the participants or an impartial observer) to redistribute income, with income being determined either by luck (random draw), choice (choice between a risky and a safe option) or a combination of inequality of opportunity and choice. In the latter case, and similar to our study, the authors introduce inequality of opportunity by restricting

[3] Laboratory experiments show more generally that people adjust their preferences and behavior conditional on initial endowments being "manna from heaven" vs. earned in a real-effort task (e.g., Hoffman and Spitzer 1985; Cherry, Frykblom, and Shogren 2002).

the choice set of one subject to the safe option which, however, is also less profitable than the risky option. In contrast to our study, subjects are not able to alter the initial distribution of opportunities in AAY (2019), they can only compensate for unequal chances by redistributing income ex-post. That is, while the overall settings are rather similar, our focus is different: AAY (2019) study how inequality of opportunity shapes preferences for income redistribution, while we look at the reverse case: how the prospect of income being redistributed in the future shapes popular support for economic inclusion, i.e., the equalization of opportunities for income generation, today.

This is also the main aspect where we differ from two other closely related studies. Eisenkopf, Fischbacher, and Föllmi-Heusi (henceforth EFF 2013) study income redistribution preferences in a two-person setting (like we do) but in their study income depends on contributions to a joint output which are determined by luck or skill (i.e., subjects' performance in a quiz task). In one variation of the skill treatment, subjects have access to a learning opportunity ("education") before participating in the quiz. Education can be more or less relevant for the task, with access to the more appropriate education assigned randomly to one member of each pair. In line with AAY (2019), EFF (2013) conclude that inequality of opportunity tends to increase the willingness to redistribute income. In contrast, Krawczyk (2010) finds, perhaps surprisingly, no evidence that subjects support greater redistribution if ex-ante probabilities of winning in a lottery are distributed more unequally within a group. Winning the lottery is determined either by luck or skill and the author varies the distribution of the probabilities of winning in both treatments. After the outcome is revealed, participants decide on how to redistribute the prize between winners and losers. Krawczyk (2010) argues that the unexpected lack of an increase in support for redistribution following an increase in inequality of opportunities might be due to subjects having difficulties with interpreting the changes in probabilities.[4]

Our study is also related to the experimental literature that uses simple games to study "procedural fairness", a concept related to equality of opportunity. Procedures are considered fair if they "create a 'level playing field', a place where the participants have equal opportunity even if the resulting allocation is not equal" (Bolton, Brandts, and Ockenfels 2005: 1054). To study subjects' support for procedural justice (in the sense of equality of opportunity), Brock, Lange, and Ozbay (2013) and Krawczyk and Le Lec (2010) use risky dictator games in which dictators do not decide on the distribution of a fixed amount, but on the distribution of the ex-ante probabilities of winning a lottery. They find that a significant share of dictators is willing to reduce their own chances of winning if this distributes the chances of winning more equally. Our study is related to these studies since we also allow subjects to equalize opportunities ex-ante, but we do this in a more complex setting. While in

[4] In a related study, Becker and Miller (2009) analyze how subjects distribute an additional "economic pie" if participants have unequal initial endowments. They find that subjects are more likely to compensate for initial inequalities if they decide behind a veil of ignorance, i.e., are not informed about their endowment.

these two studies the task of the subjects ends with the decision of the dictator, our subjects in addition have to make an investment choice and, in treatment *EndoRED*, also decide on income redistribution. In our study, both subjects decide on economic inclusion and they have to consider future investment choices and income redistribution to make rational decisions on economic inclusion. Several other studies (Grimalda, Kar, and Proto 2016; Trautmann and van de Kuilen 2016) also introduce inequality of opportunity in simple games, but contrary to Brock, Lange, and Ozbay (2013) and Krawczyk and Le Lec (2010) they do not provide subjects with the opportunity to alter the distribution of ex-ante opportunities. Nevertheless, these studies provide additional evidence that subjects (in this case responders in ultimatum and battle-of-the-sexes games) take ex-ante equality of opportunity into consideration when making their decision on whether they consider an offer to be fair.

Fairness preferences have been identified as one important reason why people support redistributive policies. Another reason is the desire of those in the more advantageous position to insure against future income losses (Alesina and La Ferrara 2005; Durante, Putterman, and van der Weele 2014). According to this line of reasoning, income redistribution sets up a safety net that insures against bad luck from investment and, as a consequence, might even encourage people to make more risky investment decisions in the first place (Bénabou 2000; Saint-Paul and Verdier 1993). Most existing experimental studies on risk-sharing focus on the conditions under which people are willing to join and stay in formal or informal risk-sharing groups (e.g. Attanasio, Barr, and Meghir 2012; Barr, Dekker, and Fafchamps 2012). Only few experimental studies have analyzed how risk-pooling in form of redistribution affects investment behavior if profitable but risky investment opportunities are available (Barr and Genicot 2008; Fischer 2013).[5] These studies come to similar conclusions: people are able to recognize the safety net redistribution provides and, in consequence, make more risky and efficient investment decision. Our experimental design varies the prospect of income, which happens either with a probability of one (treatment *RED*), a probability of zero (treatment *NoRED*) or is an endogenous choice after returns from investment are revealed (treatment *EndoRED*). This allows us to study whether subjects understand the insuring effect of income redistribution, adjust their risk-taking behavior accordingly and, as a consequence, reach more efficient outcomes.

Efficiency and relative income considerations have also been found to shape people's redistribution choices and expressed preferences for redistribution. A sizeable share of people exhibits preferences for efficiency in that they are willing to give up some of their own earnings to increase collective income (e.g. Andreoni and Miller 2002; Hedegaard et al. 2019; Tyran and Sausgruber 2006). More

[5] Note that all these studies abstract from modeling situations characterized by moral hazard, contrary to our study. In our setting, given future income redistribution (treatment *RED*), moral hazard might induce more subjects to invest in an option that is more risky but also more profitable in expectation. By facilitating investments in this option, moral hazard therefore increases in expectation individual as well collective income. We abstain from modeling situations in which moral hazard might have a negative effect, e.g., by precluding excessive risk-taking.

generally, support for redistribution tends to decrease if there is a trade-off between efficiency and equality, e.g., due to administrative costs of redistribution (e.g., Engelmann and Strobel 2004; Durante, Putterman, and van der Weele 2014) or reducing incentives to work and make an effort (Sausgruber, Sonntag, and Tyran 2019; Sutter and Weck-Hannemann 2003). We chose an experimental design in which subjects face no such trade-offs: to preclude potential disincentive effects, redistribution comes at no administrative cost and subjects choose between two investment options rather than engaging in a real-effort task. In addition, both economic inclusion and income redistribution facilitate, at least potentially, more efficient outcomes by providing access to and encouraging the choice of more profitable investment choices, respectively.

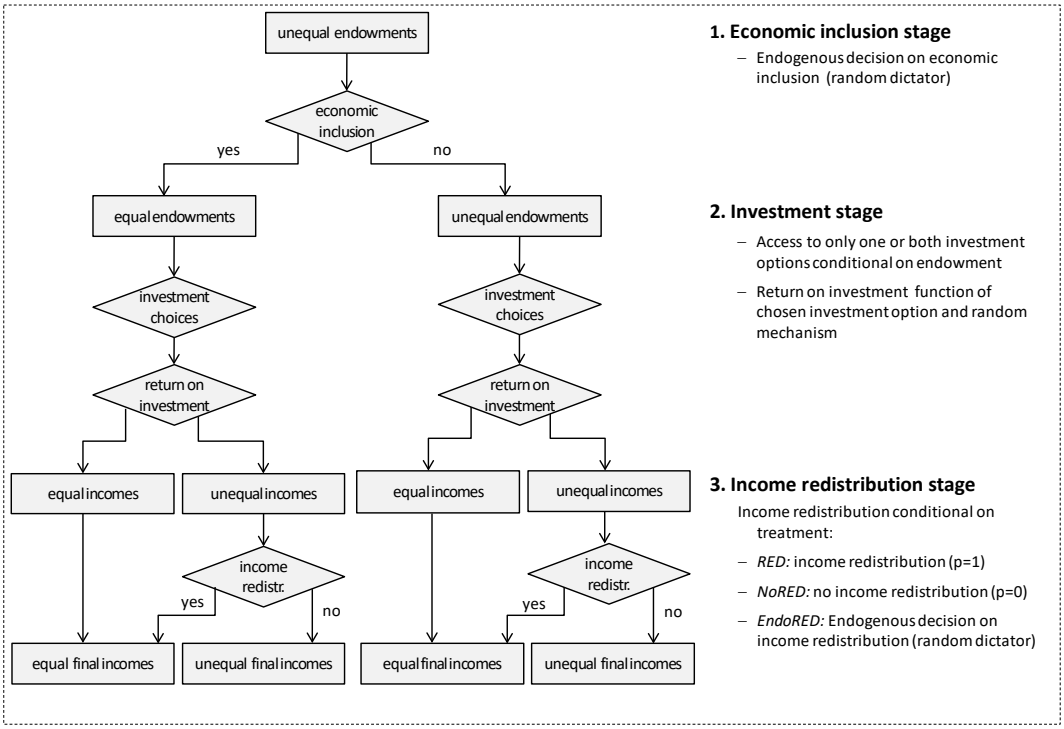
Finally, our experimental design is inspired by and in line with human capital accumulation theory (Aghion, Caroli, and Garcia-Penalosa 1999; Galor and Moav 2004) which argues that inequality might be detrimental for growth because it causes underinvestment of the poor. According to this theory, limited resources keep the poor from building up human capital. Since returns to investment in human capital are characterized by diminishing marginal returns, they are maximized if opportunities for human capital accumulation are equalized. Promoting equality of opportunity in access to quality education and other sources of human capital accumulation is thus expected to have a positive effect on growth (Cingano 2014). In our experimental setting, economic inclusion has an efficiency-enhancing potential by providing the poor with access to a more profitable investment option.

3. Experimental Design

The core of our experiment is a one-shot game played in pairs. It has three stages. Initially, subjects receive unequal endowments (low or high, see Figure 1) which can be invested in stage 2. In stage 1, subjects decide on economic inclusion, i.e., whether investment opportunities are equalized by redistributing endowments or not. In stage 2, the resulting endowments can be invested into a relatively safe option with a low return (option A) and a more risky option with a high return (option B). However, the low endowment is too low to cover the cost of investing in the more profitable option B. That is, economic inclusion in stage 1 allows both subjects to invest in option B, while the absence of opportunity-equalizing economic inclusion means that low-endowment subjects are excluded from profitable investments in option B. Subjects learn the result of their investment choice before entering stage 3, i.e., they learn whether their investment yielded a high or a low return.

In stage 3, income may be equalized, depending on the treatment. Income is equalized in treatment *RED* while there is no income redistribution in treatment *NoRED*. In treatment *EndoRED*, subjects decide endogenously on whether to equalize incomes, knowing the full history of the game, in particular what investments were chosen and whether they turned out to be successful (high return) or not (low return). Subjects are told at the beginning of the game which treatment they are assigned to.

Figure 1: Structure of the game



The main purpose of the experiment is to investigate how different income redistribution schemes shape support for economic inclusion, i.e., the equalization of opportunities.[6] We study this question in a setting that is highly stylized in many ways, e.g., with respect to the size of society, the procedure to decide on economic inclusion and income redistribution, or the extent of redistribution (we study full equalization of opportunities and incomes). Particularly noteworthy is the fact that we study redistribution which is socially desirable because it not only reduces inequality but also increases efficiency. Since we abstract from any potential cost of redistribution – which may be high outside the laboratory – we can plausibly expect economic inclusion to be highly popular in this experiment. However, we are not interested in the absolute level of popularity of economic inclusion, but how income redistribution shapes the acceptance of economic inclusion, i.e., in identifying the treatment effect on support for economic inclusion.

[6] We also run a treatment which would have allowed us to study the converse, i.e., the effect of economic inclusion on the acceptance of income redistribution. While we find that question also interesting, it is somewhat less innovative (see literature in section 2) and we concluded that this issue should be relegated to a separate paper to keep the complexity of the current paper tractable.

Procedures and Parameters

In stage 1, the *economic inclusion stage*, subjects have the possibility to equalize endowments in their pair (initial endowments are $e_l = 30$ tokens and $e_h = 70$ tokens, respectively). Economic inclusion implies transferring 20 tokens such that both subjects end up with a medium endowment of $e_m = 50$ tokens, i.e., economic inclusion has a direct cost to those with the high endowment, but has no other (indirect) cost (no administrative costs or efficiency losses). Economic inclusion is determined using a random dictator mechanism: both subjects indicate simultaneously whether they support or reject economic inclusion; one subject is selected randomly and his or her choice is implemented.[7] Assuming rational and self-interested agents, economic inclusion is always in the best interest of the low-endowment subjects, while the preferred outcome of the high-endowment subjects depends on the treatment (see section 4.1 for predictions). We are primarily interested in the choices of the high-endowment subjects. By using a random dictator mechanism and implementing small groups of $n = 2$, we make sure that the answers of both subjects are pivotal and both have an incentive to support their preferred outcome (see Tyran and Wagner 2019 on experiments in which privotality is low or uncertain).[8] At the end of stage 1, subjects learn the choices of both subjects and the resulting distribution of endowments.

Table 1: Individual income after investment (min, max, expected)

		e_l	e_m	e_h
Option A	π_{min}	50	70	90
	E(π)	60	80	100
	π_{max}	100	120	140
Option B	π_{min}		50	70
	E(π)		90	110
	π_{max}		100	120

Parameters: *endowments:* $e_l = 30$, $e_m = 50$, $e_h = 70$; *cost:* $c(A) = 30$, $c(B) = 50$; *returns:* $r_l = 50$, $r_h = 100$; *return probabilities:* $p(r_l|A) = 0.8$, $p(r_h|A) = 0.2$; $p(r_l|B) = 0.2$, $p(r_h|B) = 0.8$; *income:* $\pi = e - c + r$

In stage 2, the *investment stage*, subjects can invest their endowments either in option A or option B. Both options have the same possible outcomes, i.e., they yield either a high return of 100 tokens (r_h) or a low return of 50 tokens (r_l). However, the probability of receiving r_h is substantially higher for

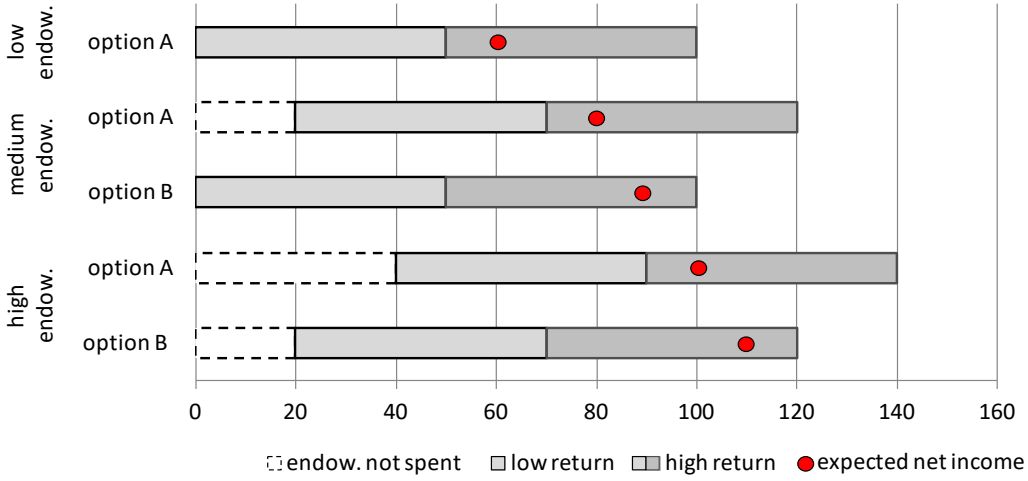
[7] The choice was described to subjects as vote. Majority voting with random breaking of ties is equivalent to the random dictator procedure in this case.

[8] By giving low-endowment subjects a say in the decision on economic inclusion, we reflect the fact that the economically *excluded* are usually democratically *included*, i.e. able to participate in democratic decisions. Of course, many alternative settings (variations in the size of the group, the share of economically excluded subjects or the voting mechanisms) can be thought of. In the concluding section we discuss the consequence of such alternative design choices.

option B $[p(r_h\,|B) = 0.8]$ than for option A $[p(r_h\,|A) = 0.2]$. Investing in option B is thus more profitable in expectation than investing in option A, with an expected gross return of 90 vs. 60 tokens, respectively. Investing in option B is more costly than investing in option A, with $c(B)$ = 50 tokens and $c(A)$ = 30 tokens. A subject's net income π after investment is equal to the sum of the endowment not spent $(e - c)$ plus the return r from investment: $\pi = e - c + r$.

Parameters are set such that the expected income $E(\pi)$ from option B is larger than the expected income from option A (see Table 1 and Figure 2). The two options are equally risky in terms of their standard deviation ($\sigma_A = \sigma_B = 29.15$), but option B comes, *ceteris paribus*, with a lower net minimum income π_{min} than option A due to its higher cost. That is, although option B is overall more attractive due to its higher expected income, it does not first-order stochastically dominate option A in terms of net income.[9] Subjects who are averse to regret risk, i.e., anticipate regretting their choice if they end up with a lower income after investing in option B than the income they would have received, *ceteris paribus,* after investing in option A, might therefore consider option A the safer choice (see also section 4.2).

Figure 2: Individual *net* income conditional on endowment, investment choice and return (without income redistribution)



We held the possible outcomes after investment (r_l and r_h) and, in consequence, the standard deviations of both investment options constant in order to model the following considerations

[9] Note that with respect to *returns*, option B first-order stochastically dominates option A. That is, the probability of receiving at least r_l is equally high for option A and B, but option B comes with a higher probability of receiving r_h: $p[B \geq r] \geq p[A \geq r]$ *f*or $r = r_l$ and $p[B \geq r] > p[A \geq r]$ for $r = r_h$. But with respect to net *income*, option B does not stochastically dominate option A, since investing in option B is more costly. As a consequence, option B comes with a higher probability of receiving an income smaller or equal to 100 tokens, but option A comes with a higher probability of receiving an income larger than 100 tokens: $p[\mathrm{B} \geq \pi] \geq p[\mathrm{A} \geq \pi]$ for $\pi \leq 100$ and $p[\mathrm{B} \geq \pi] \leq p[\mathrm{A} \geq \pi]$ for $\pi > 100$

accompanying human capital investment decisions: It is possible to be hired for a job which pays a high income after completing high school [$p(r_h \,|A) = 0.2$], but the probability of obtaining such a job and receiving the same high level of income is larger after graduating from college [$p(r_h \,|B) = 0.8$]. At the same time, people might regret having invested time and money in higher or extra education (*option B*), if they end up with a low-paying job (r_l) after all. To prevent regretting their choice, they might even abstain from investing in higher education (*option B*) in the first place. Having this and similar situations in mind, we wanted to keep the possible returns from investment (r_l and r_h, reflecting the wages of potential jobs) constant across investment options (*A* and *B*, reflecting different education choices), but vary the probability of realizing a high return ($p(r_h \,|A)$ and $p(r_h \,|B)$, reflecting differences in the probability of obtaining a well-paying job conditional on one's education level).

Note that subjects in our experiment are credit-constrained, i.e., they cannot borrow tokens from other subjects or an external source. As a consequence, if opportunities are not equalized in stage 1, low-endowment subjects cannot cover the cost of the more profitable option B and are bound to invest in option A. Inequality in endowments thus translates into inequality in access to investment opportunities. Economic inclusion bears a double benefit in our setting. It is attractive not only because it reduces inequality of opportunity, but also for its potential to increase efficiency (in expectation) since it allows both subjects to invest in the more profitable option B.

In stage 3, the *income redistribution stage,* income might be equalized, depending on the treatment. Subjects are informed at the very beginning of the session about the procedures in the income redistribution stage such that they can make their decisions in stage 1 and 2 in anticipation of what is about to happen in stage 3. Income is either known to be equalized (treatment *RED*) or not (treatment *NoRED*), or equalization is chosen endogenously in stage 3 using a random dictator mechanism (treatment *EndoRED*).

In *EndoRED*, decisions on income redistribution in stage 3 follow the same procedure as decisions on economic inclusion in stage 1. At the beginning of stage 3, subjects receive the following information about *both* group members: initial endowment (e_l or e_h), vote in economic inclusion in stage 1 (yes or no), endowment after the economic inclusion stage (e_l, e_m or e_h), available investment options (only *A* or both *A* and *B*) and actual investment choice (*A* or *B*), cost of the chosen investment option (*c(A)* or *c(B)*), return from investment (r_l or r_h), and net income (π). This information helps subjects to understand the sources of income inequality when deciding on income redistribution. That is, they are provided all necessary information to judge whether a lower income is due to unequal investment opportunities (because there was no economic inclusion in stage 1), the choice of a less profitable

investment option (option A) or bad luck (low return despite choosing option B), or a combination of these factors.[10, 11]

We elicited subjects' beliefs about their partners' decision regarding economic inclusion (elicited in all treatments at the end of the economic inclusion stage before subjects were informed about the outcome of this stage). In *EndoRED*, we also asked them how likely they consider income redistribution (elicited twice, before and after subjects are informed about the outcome of the economic inclusion stage).

The experiment was programmed in z-tree (Fischbacher 2007) and participants were recruited via ORSEE (Greiner 2015). Participants were randomly assigned to a treatment and a group and received instructions on paper (see Appendix I for sample instructions). Before the start of the experiment, participants answered a series of control questions to check that they understand the rules of the game. Payoffs were denoted in tokens, and correct beliefs were incentivized with an extra payment of three tokens. The sum of tokens earned during the experiment were converted into Euro (1 token = €0.15) and paid to the participants in private at the end of the experiment. Before payment, participants were asked to complete a questionnaire on how fair they considered certain situations in the experiment, questions about attitudes on redistribution, fairness and reciprocity[12], a general risk question, a cognitive ability test (Toplak, West, and Stanovich 2014), and several socio-demographic questions. Participants received an additional payment of €2 for completing the post-experimental questionnaire.

[10] Rey-Biel, Sheremeta, and Uler (2018) show in an experimental setting that beliefs about the sources of income differences moderate differences in giving. By providing subjects with complete information, we seek to avoid that potentially inaccurate beliefs about income differences drive subjects' preferences for redistribution in our study.

[11] Data from the income redistribution stage of *EndoRED* was collected using the strategy method. That is, subjects were confronted with up to eight situations which could potentially follow their investment decision. Variables were subjects' own return from investment and income after investment as well as their partners' investment decision, return from investment and income after investment. However, due to small sample sizes, we abstained from analyzing these data. For previous research on how factors such as choice, effort or luck shape support for income redistribution see for example Cappelen et al. (2013) or Durante, Putterman, and van der Weele (2014).

[12] We followed Dohmen *et al.* (2009) and used the wording of the German SOEP (Socio-economic Panel Study).

4. Predictions and Hypotheses

This section develops predictions and hypotheses on how future income redistribution affects support for economic inclusion (section 4.1), subjects' propensity to make risky, but profitable investment choices (section 4.2), the consequences for efficiency (section 4.3), and for income equality (section 4.4).[13]

4.1 Support for Economic Inclusion

With economic inclusion, 20 tokens are transferred from the high-endowment subjects to the low-endowment subjects. After this transfer, low-endowment subjects have the means to invest in the more profitable option B. If they choose to invest in option B, they earn in expectation an additional 30 tokens. If they stick to option A, they still earn an additional 20 tokens due to the earlier transfer from the high-endowment subjects (see Table 1). Across subjects, equalizing opportunities thus has an efficiency-enhancing potential of 10 tokens, which is, however, only realized if both subjects invest in option B.

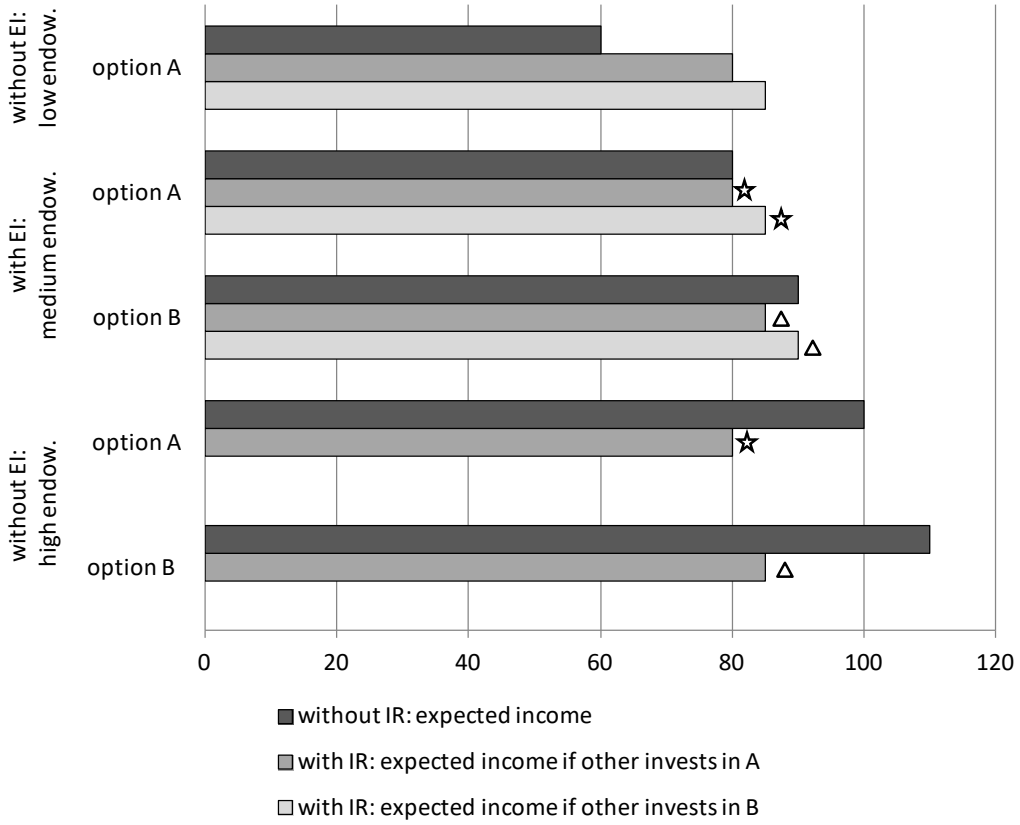
Support for economic inclusion benefits low-endowment subjects in all treatments and irrespective of the expected investment choice of the other subject (see difference in expected income between low-endowment and medium-endowment subjects in both Table 1 and Figure 3). This is not the case for high-endowment subjects who carry the cost of economic inclusion. If income is not redistributed, high-endowment subjects earn 20 tokens more without economic inclusion than with economic inclusion. In *NoRED*, where income is not redistributed in the future, rational and self-interested high-endowment subjects are thus expected to *reject* economic inclusion. Only high-endowment subjects with sufficiently strong social preferences to compensate for their economic loss may nevertheless approve of economic inclusion in this treatment. Social preferences motivating a decision against one's material self-interest may be altruistic or result from a concern for efficiency (the latter seems to be the weaker motive, see, e.g., Höchtl, Sausgruber, and Tyran 2012 or Durante, Putterman, and van der Weele 2014).

The reasoning is different in *RED*, where income is pooled and shared in stage 3. In this treatment, following economic inclusion, both low- and high-endowment subjects earn in expectation more (if rates of investment in option B increase) or at least the same (if low-endowment subjects stick to option A). In Figure 3, the bars marked with a triangle show that high-endowment subjects earn in expectation 85 tokens if they invest in option B. In case of economic inclusion, the same subjects –

[13] For the sake of brevity, we do not report on the motivations of high-endowment subjects in *EndoRED* for supporting or rejecting income redistribution. Unfortunately, the data is too limited (small *n*) to provide significant results. For previous research on this question see, for example, Cappelen et al. (2013) or Durante, Putterman, and van der Weele (2014).

now with a medium endowment – still earn 85 tokens in expectation if the other subject invests in option A, but their expected income increases to 90 tokens if the other subject chooses option B. Similarly, the bars marked with a star show the expected income of (former) high-endowment subjects that choose to invest in option A. Again, the expected income is the same (80 tokens) or larger (85 tokens) after economic inclusion, conditional on the investment choice of the other subject (option A or B, respectively). In *RED*, supporting economic inclusion is thus Pareto-dominant for high-endowment subjects irrespective of their social preferences.

Figure 3: Expected individual income in tokens conditional on economic inclusion (EI), investment choices and income redistribution (IR)



Notes: stars (☆) indicate the possible expected income of a subject who started with a high endowment and chose option A given income redistribution, conditional on economic inclusion and investment choice of the other subject; triangles (Δ) indicate the possible expected income of a subject who started with a high endowment and chose option B given income redistribution, conditional on economic inclusion and investment choice of the other subject;

Parameters: *endowments:* $e_l = 30$, $e_m = 50$, $e_h = 70$; *cost:* $c(A) = 30$, $c(B) = 50$; *returns:* $r_l = 50$, $r_h = 100$; *return probabilities:* $p(r_l|A) = 0.8$, $p(r_h|A) = 0.2$; $p(r_l|B) = 0.2$, $p(r_h|B) = 0.8$; *income:* $\pi = e - c + r$;

In *EndoRED*, high-endowment subjects must form beliefs about the likelihood of income redistribution and investment choices of the low-endowment subjects to make rational choices

regarding economic inclusion. Rational and self-interested high-endowment subjects planning to invest in option B should support economic inclusion only if they consider the chances of future income redistribution to be sufficiently high. These are the cut-off values: If high-endowment subjects expect the other player to invest in option B, they should support economic inclusion if they expect income to be redistributed with a probability of $p \geq 0.8$. In this case, the expected income of high-endowment subjects is larger with economic inclusion ($E(\pi) = 90$) than without economic inclusion ($E(\pi) = 110$ without income redistribution, $E(\pi) = 85$ with income redistribution). If high-endowment subjects expect the other player to invest in option A, the cut-off value is at an even higher probability of $p \geq 0.83$. In this case, the expected income of high-endowment subjects is only larger with economic inclusion ($E(\pi) = 85$) than without economic inclusion ($E(\pi) = 110$ without income redistribution, $E(\pi) = 80$ with income redistribution) if income is redistributed with a probability of $p \geq 0.83$. As a consequence, we expect rational and self-interested high-endowment subjects to support economic inclusion only if they indicate income redistribution to be "very likely" (corresponds to a cut-off value of $p = 0.75$).

In summary, we expect high-endowment subjects to be more likely to support economic inclusion in *RED* than in *NoRED* (*hypothesis H1a*). We hypothesize further that high-endowment subjects only support economic inclusion in *EndoRED* if they believe income redistribution to be very likely (*hypothesis H1b*).

4.2 Propensity to Take Risky but Efficient Investment Decisions

Without economic inclusion, low-endowment subjects cannot invest in the more profitable (but more risky) option B, while high-endowment subjects have the choice between option A and B. With economic inclusion, all subjects have the same endowment and equal access to both investment options A and B. The risk of receiving a lower income after investing in option B than after investing in option A is substantial, at about a third ($p(\pi_A > \pi_B) = p[(r_l|A) \cap (r_l|B)] + p[(r_h|A) \cap (r_h|B)] = 0.32$). This type of risk has been coined "regret risk" (Bell 1982; Loomes and Sugden 1982; Connolly and Butler 2006) and is based on the assumption that a subject's utility is reduced if a lower outcome is realized than if another available alternative had been chosen. As a consequence, we assume that subjects perceive option B as the more risky of the two investment options in terms of regret risk.

Recall that according to standard risk measures both options are equally risky (equal standard deviation) and subjects should always invest in option B, which comes with a higher expected return, if they have the opportunity to do so. From this follows our assumption that the decision of subjects who invest in option A although they could have invested in option B is driven by regret risk. The role of regret risk on investment decisions diminishes if income is redistributed since the risk of receiving a

low return is then shared. Income redistribution thus operates as a safety net that might encourage more subjects to invest in option B by triggering moral hazard considerations.

In summary, we expect subjects to be more likely to invest in option B in *RED* than in *NoRED (hypothesis H2a)*. Differences in investment behavior between these two treatments can be explained by regret risk. We hypothesize further that in *EndoRED* subjects' propensity to invest in option B increases with how likely they believe income redistribution to be (*hypothesis H2b*).

4.3 Efficiency

Economic inclusion has an efficiency-enhancing potential if more subjects choose to invest in option B after economic inclusion than before. If both subjects invest in option B, group income is equal to 180 tokens, compared to 170 tokens if one subject invests in option A and the other one in option B, and 160 tokens if both invest in option A. We expect to observe the most efficient outcomes in *RED*, the least efficient ones in *NoRED,* with *EndoRED* in-between (*hypotheses H3a* and *H3b*).

4.4 Equality of Income

Does equality of opportunity facilitate equality of income? By design, income equality without additional income redistribution is only possible if endowments are redistributed and both subjects choose the same investment option. If these conditions are met, the probability that both subjects receive the same return from investment and, in consequence, same net income is equal to 68 percent.[14] As outlined above, given economic inclusion, we expect to observe more groups in which both subjects invest in option B if income is redistributed – with certainty or potentially – than if this is not the case. We therefore expect equality in net income (i.e., *without* income redistribution) to be most likely in *RED,* followed by *EndoRED* and least likely in *NoRED* (*hypothesis H4a*).

5. Results

In total, 162 subjects[15] participated in eight experimental sessions which lasted approximately 60 minutes each (28 in *RED,* 30 in *NoRED* and 104 in *EndoRED*) at the VCEE lab at the University of Vienna. 57 percent of the participants were female and they were on average 25.2 years old. Subjects were mostly students (95 percent) from a broad range of studies offered at the University of Vienna, 27 percent of them studied economics or business. They earned €15.5 on average.

[14] If both subjects choose option A, the probability that both receive a low return is equal to p=0.64, the probability that both receive a high return p=0.04. For option B, probabilities are equal to p=0.04 and p=0.64, respectively.

[15] Results are robust to excluding four subjects with weak performance in the initial control questions.

The presentation of the results follows the structure of the previous section: support for economic inclusion is analyzed in section 5.1, subjects' propensity to make risky investment decisions in section 5.2, the efficiency of outcomes in section 5.3, and equality of income in section 5.4. An overview of basic descriptive statistics is provided in Appendix II.

5.1 Support for Economic Inclusion

Economic inclusion benefits the otherwise excluded directly but bears an immediate cost for the high-endowment subjects who fund the transfers to the low-endowment subjects. In line with these material interests, we find (in the pooled data from all treatments) that support for economic inclusion is significantly higher among low-endowment subjects than among high-endowment subjects (Fisher's exact test, $p < 0.01$, $n = 162$). Almost all low-endowment subjects (95 percent) support economic inclusion, but only about a third (32 percent) of the high-endowment subjects do. The analysis in this section focuses on high-endowment subjects, which is the more interesting group because of the potential tension between self-interest and concerns for fairness and efficiency.

Figure 4: Support for the economic inclusion by high-endowment subjects ($n = 81$)

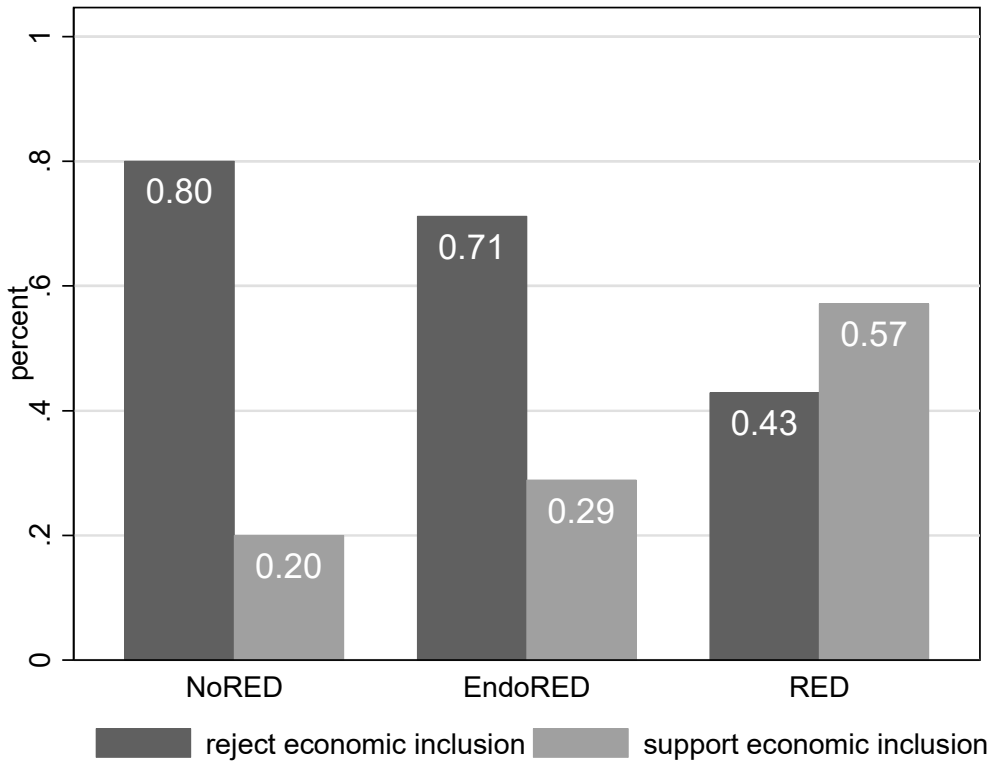


Figure 4 shows that high-endowment subjects are about three times more likely to support economic inclusion if there is a policy in place to redistribute income in the future (Fisher's exact test, $p < 0.1$, $n = 29$). 57 percent of the high-endowment subjects support economic inclusion in *RED* (see rightmost

bar in figure 4), but only 20 percent of the high-endowment subjects do in *NoRED*. This result is in line with *hypothesis H1a* and suggests that high-endowment subjects understand that economic inclusion is Pareto-dominant in *RED*, as it is a prerequisite for maximizing their own payoff.

While support for economic inclusion is stronger in *RED* than in *NoRED*, it is far from unanimous. Why did a strong minority of high-endowment subjects (43 percent) reject economic inclusion in *RED*, despite its potential to maximize their own payoff? One possibility is that the high-endowment subjects who oppose economic inclusion do not recognize the potential benefits of economic inclusion. This possibility is not entirely implausible since doing so is demanding. It requires the anticipation of the indirect effect of economic inclusion, which consists of inducing a change of investment behavior in the otherwise low-endowment subjects. However, we find no evidence in support of this hypothesis. If we proxy subjects' cognitive abilities by the share of correctly answered control questions or the performance in a test for cognitive abilities, we find no significant difference between supporters and opponents of economic inclusion (Fisher's exact tests, $p > 0.1$, $n = 14$). While these tests are underpowered, the fact that 95 percent of the low-endowment subjects support economic inclusion suggests that the game was not overly complicated for subjects and material incentives were fairly clear. Using our survey data, we also checked whether ideological predispositions (Stuber and Schlesinger 2006; Friedrichsen, König, and Schmacker 2018) such as opinions about the social acceptability of income inequality or a potentially stigmatizing effect of receiving social welfare transfers explain the puzzle. We also find no evidence in support for that hypothesis (Fisher's exact tests, $p > 0.1$, $n = 14$), which, again, might be due to the low power of the tests.

Despite overwhelming rejection of economic inclusion in *NoRED* (as hypothesized in section 4.1), we find that a share of 20 percent of high-endowment subjects supports economic inclusion in *NoRED* although it reduces their expected income. A candidate explanation for this behavior is social preferences. We find, however, no significant evidence in our survey data that high-endowment subjects who support economic inclusion are more pro-socially motivated than their peers who reject economic inclusion (Fisher's exact tests, $p > 0.1$, $n = 15$; note again the low power of the tests).

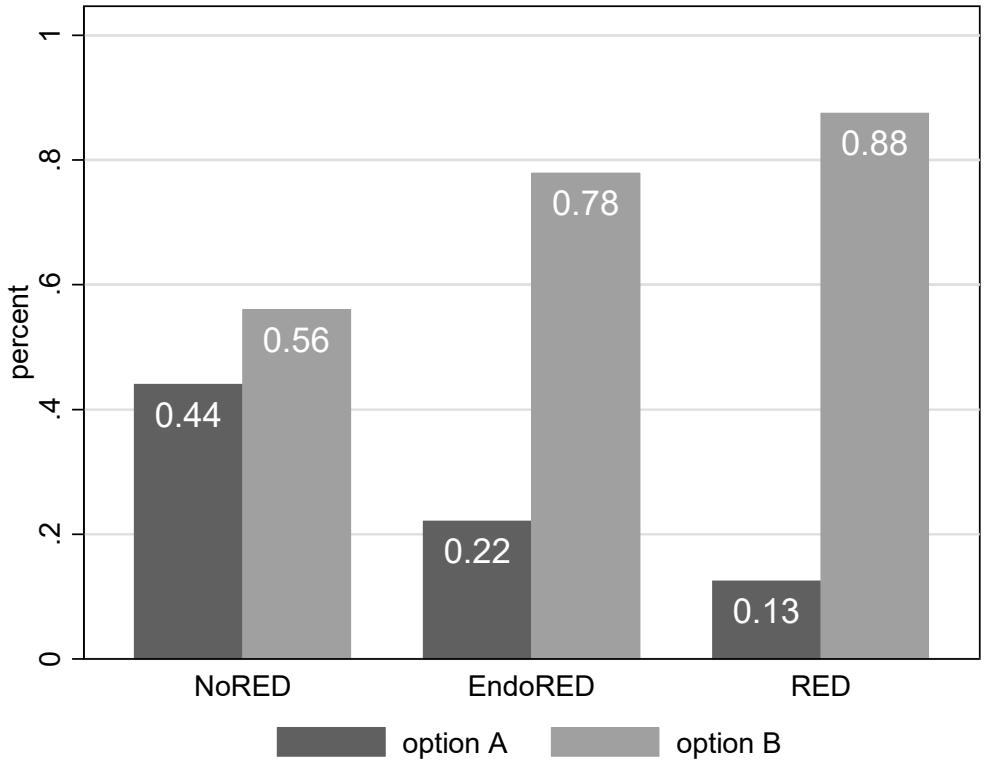
In *EndoRED*, subjects do not know for sure whether income will be redistributed in the future at the time of deciding on economic inclusion. As expected, this uncertainty seems to have biased the decision against economic inclusion since the overall rate of support (29 percent) is clearly closer to the one in *NoRED* (20 percent) than the one in *RED* (57 percent). This behavior is driven by beliefs, as stated in *hypothesis H1b*: Support for economic inclusion is about twice as strong among those who expect income redistribution to be "very likely" than among the rest (35 percent vs. 17 percent). While the difference is stark, it is not statistically significant due to the low number of observations (Fischer's exact test, $p > 0.1$, $n = 52$).

5.2 Propensity to Take Risky but Efficient Investment Decisions

This section analyzes investment decisions by subjects that actually had a choice between investing in option A and option B. Recall that this is always the case for high-endowment subjects and in case of economic inclusion also for initially low-endowment subjects (in that case all subjects have a medium endowment of 50 tokens to invest).

Figure 5 shows that future income redistribution encourages investments in option B. In fact, the share of subjects investing in option B is much higher in *RED* than in *NoRED* (88 percent vs. 56 percent). This difference is statistically significant (Fisher's exact test, $p < 0.05$, $n = 49$) and lends support to hypothesis *H2a*. It also lends support to our assumption that regret risk is a non-negligible driver of investment behavior.

Figure 5: Investment choices of medium- and high-endowment subjects ($n = 135$)



Recall that in *RED*, the risk of receiving a low return from investment is borne by both subjects jointly. This safety net function of redistribution encourages more subjects to take the risk of investing in option B in *RED* in comparison to *NoRED*, where the risk is borne by each subject individually. However, we find little support for this claim in the risk attitudes we elicited with a survey following Dohmen et al. (2011). There are no significant differences in these risk attitudes across subjects investing in option A or B – which is perhaps not surprising given that both investment options are equally risky according to standard measures.

Figure 5 also shows that in *EndoRED*, 78 percent of subjects who are able to do so invest in option B. This share is close to the 88 percent that invest in option B in *RED* (Fisher's exact test, $p > 0.1$, $n = 110$) and it is significantly larger than the 56 percent we observe in *NoRED* (Fisher's exact test, $p < 0.05$, $n = 111$). It thus seems that the mere possibility of income redistribution in *EndoRED* already increases subjects' propensity to invest in option B compared to when income redistribution is precluded by design (*NoRED*). Despite this clear difference in investment behavior conditional on income redistribution, we find no support for hypothesis *H2b* in our survey data: There is no significant difference in investment decisions between subjects who consider income redistribution (very) likely and those who consider it (very) unlikely (Fisher's exact test, $p > 0.1$, $n = 86$).

5.3 Efficiency

The fact that subjects are more likely to invest in option B if income is redistributed triggers, by design, also more efficient outcomes. Remember that the efficiency-enhancing potential of economic inclusion is realized if both subjects choose to invest in option B.

Figure 6: Group investment choices after economic inclusion ($n = 108$)

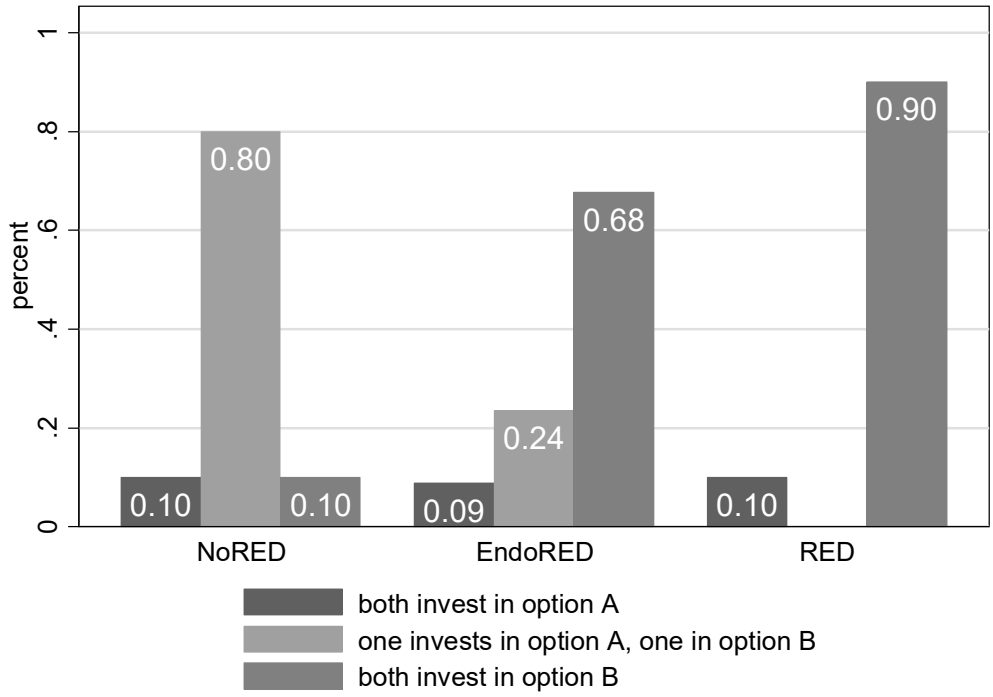


Figure 6 shows that, given equality of opportunity, this is the case for 90 percent of the groups in *RED*, but only for 10 percent in *NoRED* (Fisher's exact test, $p < 0.01$, $n = 40$). Note that in *NoRED,* in 80 percent of the groups one subject chooses to invest in option A despite having the opportunity to invest in option B. That is, we find strong support for the claim that included subjects make good use

of the opportunities they are provided through economic inclusion, but only if income redistribution policies are in place. This difference in investment behavior has direct consequences for the groups' income, as expected in *hypothesis H3a*: average group income is significantly larger in *RED* (184 tokens) than in *NoRED* (160 tokens; Wilcoxon rank sum test, $p < 0.05$, $n = 40$).

In *EndoRED*, in 68 percent of all groups both subjects chose option B, which is significantly more than in *NoRED* (Fisher's exact test, $p < 0.01$, $n = 88$). As a consequence, average group income is also in *EndoRED* (182 tokens) significantly larger than in *NoRED* (Wilcoxon rank sum test, $p < 0.05$, n= 88), supporting *hypothesis H3b*.

5.4 Equality of Income

Across treatments, average group income is not only larger if opportunities have been equalized by economic inclusion, but income is also more equally distributed. This does not come as a surprise, since groups can by design only reach equality in net income (i.e., *without* income redistribution) if endowments have been equalized before.

Figure 7: Share of equal income groups without and with income redistribution, given economic inclusion ($n = 108$)

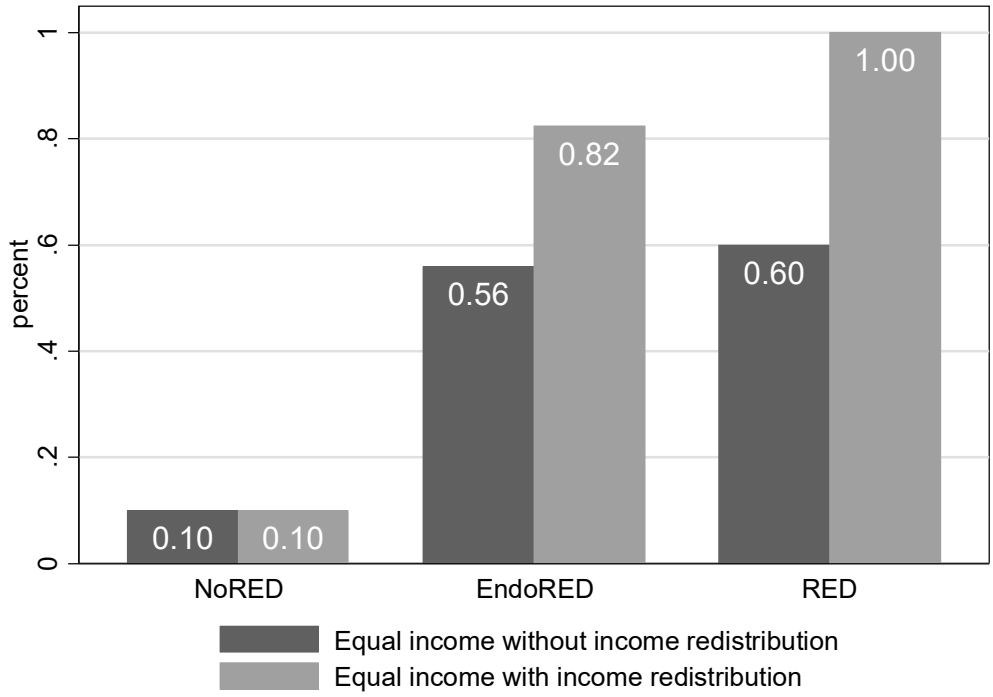


Figure 7 shows that, given equality of opportunity, 60 percent of the groups in *RED,* 56 percent of the groups in *EndoRED*, but only 10 percent of the groups in *NoRED* reach equality of income *without* income redistribution. The difference between *NoRED* and the other treatments is statistically highly

significant (Fisher's exact tests, $p < 0.01$, $n = 40$ for *NoRED* vs. *RED*, $n = 88$ for *NoRED* vs. *EndoRED*), supporting *hypothesis H4a*. Since equality of income without income redistribution is only possible if both subjects invest in the same investment option, the differences in equality of income follow directly from differences in investment decisions across treatments (as outlined in the previous section 5.3).

After the income redistribution stage, the share of equal income groups remains by design unchanged in *NoRED* and is equal to one in *RED*. In *EndoRED* the share increases from 0.56 to 0.82 due to additional income redistribution in this stage.

6. Concluding Remarks

This study has shown that future income redistribution can promote support for economic inclusion which, in turn, fosters profitable investments and efficiency. In a laboratory experiment with tight control, we find that future income redistribution promotes efficiency through two channels. First, it triggers support for economic inclusion, which equalizes opportunities for income generation and enables all subjects to invest in a more profitable option. Second, the insurance effect of income redistribution encourages subjects to choose the more risky, but also more profitable, investment option. As a result, overall incomes are higher with income redistribution (treatment *RED*) than without income redistribution (treatment *NoRED*). We find the same chain of effects holds, albeit somewhat weaker, if income redistribution is uncertain (treatment *EndoRED*).

Understanding the determinants of popular support for economic inclusion is highly policy relevant. A lack of support for economic inclusion can generate "inequality traps" in which economic, social and political inequalities persist over time and across generations (Ferreira and Walton 2005). Low support for economic inclusion may prevent the poor from building up human capital and harm growth (Aghion, Caroli, and Garcia-Penalosa 1999; Galor and Moav 2004).

Since we are, to the best of our knowledge, the first to experimentally study the effect of income redistribution on support for economic inclusion, we chose a highly stylized setting with conditions that give our hypothesis (income redistribution triggers efficiency by promoting support for economic inclusion and more efficient investment choices) the best shot. In the following, we comment on how our results might depend on procedures and parameters of our experiment.

The extrapolation of findings from tightly controlled laboratory experiments to more complex settings in which parameters are not known ("the wild") always requires due care, and this also applies to

studies on redistribution (see Levitt and List 2007).[16] Online experiments provide an intermediate case between the lab and "the wild" (see Thöni, Tyran, and Wengström 2012 for an example), by providing control over many parameters while also allowing for larger and more representative samples than those studied in the lab. Running our experiments online would allow to increase group size, to vary the share of economically excluded subjects and the extent to which they can participate in voting (e.g., a setting in which the economically excluded are also politically excluded might be interesting). We speculate that our results would be essentially robust to such changes. However, variation in the costs and benefits of redistribution, the available investment options and alternatives to economic inclusion, may substantially affect our results.

To give the test of our hypothesis that income redistribution increases efficiency by promoting economic inclusion the best shot, we deliberately abstained from implementing efficiency-reducing effects of redistribution such as administrative costs or disincentive effects (e.g., Sausgruber, Sonntag, and Tyran 2019). Disincentive effects occur if people are discouraged to work because their effort is taxed. Such effects can be studied in real-effort tasks in the lab, and effort has indeed been found to respond to variations in tax rates (Sutter and Weck-Hannemann 2003). Disincentive effects are potentially relevant in "the wild" but their extent is debated (Keane 2011; Saez, Slemrod, and Giertz 2012).

An important channel though which economic inclusion unfolds its efficiency-enhancing potential is the "safety net" function of income redistribution. We find that subjects are more willing to invest in the risky, but also more profitable option with future income redistribution than without. This change in behavior is due to moral hazard which has only an upside in our experiment. The reason is that in stronger incentives to take risks are beneficial in our experiment because the more risky option is also the more profitable one. However, it is easy to think of cases in which moral hazard has a downside. These situations could be studied in the lab, for example, by providing subjects with additional investment options that are more risky but collectively not more profitable. In the presence of such options (and if the belief that strong moral hazard effects are looming is widespread), income redistribution is not guaranteed to induce support for economic inclusion, and might even reduce it. This is particularly likely to be the case if the high-endowment voters are strongly risk averse (see Cettolin, Riedl, and Tran 2017).

The availability of alternatives to economic inclusion for providing access to investment opportunities may also substantially affect results. In our study, low-endowment subjects were credit constrained, i.e., they were unable to invest in the more profitable option due to a lack of access to individual

[16] Our current sample is WEIRD, i.e., from Western, Educated, Industrialized, Rich and Democratic countries. While substantial cross-country variation in preferences for giving have been found (e.g., Rey-Biel, Sheremeta, and Uler 2018), the choice of the proper subject pool depends on the research question at hand (Gächter 2010).

credits. In "the wild", the presence of credit constraints is rather plausible among the poor who are unable to provide collateral (Ferreira and Walton 2005). In the lab, we could (unrealistically) have implemented perfect credit markets, and in the presence of costless borrowing, we would expect a sharp drop in the support for economic inclusion by high-endowment subjects in both *RED* and *NoRED*. In that sense, functioning credit markets are a substitute for the welfare state. We believe our experiment provides an interesting workhorse to study how popular support for economic inclusion is shaped by the presence of (more or less easily available) credit and (more or less costly) income redistribution policies.

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Appendix I: Instructions for *EndoRED* (translated from German)

Welcome to the experiment and thank you for your participation!
Please do not talk to the other participants of the experiment

During the experiment, you and the other participants are asked to make decisions in which you can earn money. Your payout depends on your own decisions and the decisions of the other participants. You are paid individually, privately and in cash after the experiment. During the experiment, we are not talking about Euro, but tokens (game coins). Tokens are converted after the experiment at the following exchange rate:

1 token = 0.15 Euro

Please take sufficient time to read the explanations and make your decisions. You cannot influence the duration of the experiment by making quick decisions. The experiment is completely anonymous. You and the other participants will not learn who you played with, neither during the experiment nor afterwards.

If you have questions, please raise your hand. One of the experimenters will come to you and answer your question in private.

The experiment is expected to last about 60 minutes.

Proceedings of the experiment
At the beginning of the experiment, all participants are randomly divided into groups of 2 players each. You are playing with the same person throughout the entire experiment. At the beginning, you and the other player in your group both receive a number of tokens as a budget. During the experiment, you can invest this budget to earn more tokens. At the end of the experiment, your token income will be converted into Euro and paid to you.

The experiment consists of three parts.

Part 1: Budget allocation
At the beginning of the experiment, the computer randomly allocates a budget to both players. One player receives a **low** budget of 30 tokens and the other player a **high** budget of 70 tokens.

In the first part of the experiment you can vote on whether this budget distribution should be preserved or the budget should be redistributed. Redistribution implies that both players continue to play with an equal budget of 50 tokens. No redistribution implies that both players continue to play with the budget that was randomly assigned by the computer.

The voting proceeds as follows: Both players answer the question "Would you like to redistribute?" simultaneously with either "yes" or "no". Then, the computer randomly selects one of the two players,

each player having the same chance of being selected. The vote of the selected player decides whether budgets are redistributed or not. If the selected player has voted for redistribution, both players continue to play with 50 tokens. If the selected player has voted against redistribution, both players continue to play with their original budget. At the end of the first part you will learn whether the budget has been equalized.

Part 2: Investment

In the second part of the experiment, you can invest your budget in one of two options.

Investing in option 1 costs 30 tokens and investing in option 2 costs 50 tokens. You can only choose option 2 if your budget after redistribution is equal to 50 tokens or more. This restriction also applies to the other player.

Both investment options result in either a low return of 50 tokens or a high return of 100 tokens. The chance of receiving a low or high return depends on the option. The table shows: Option 2 comes with a high chance (80%) of a high return (100 tokens), while option 1 comes with a high chance (80%) of a low return (50 tokens).

	Option 1	**Option 2**
Cost of investment:	30 tokens	50 tokens
Chance of a low return (50 tokens):	80%	20%
Chance of a high return (100 tokens):	20%	80%

Both players make their investment decision simultaneously and independently.

Part 3: Income distribution

Calculation of income

Both players are informed about their income and the other player's income. The income of a player is calculated as follows:

Income = budget - investment costs + return from investment

It is possible that you and the other player receive different incomes. This may be because you had different budgets, chose different options, or received different returns from investment. The table in the summary at the end gives an overview which incomes can be achieved conditional on the budget and the investment option.

Voting

As in the first part of the experiment, you and the other player can again vote on whether to preserve the prevailing income distribution or whether to redistribute incomes. No redistribution implies that both players keep their income. Redistribution implies transferring tokens from the higher-income player to the lower-income player such that both players receive the same income.

> *Example 1:* Player 1 has an income of 140 tokens, player 2 has an income of 90 tokens. In case of redistribution, 25 tokens are transferred from player 1 to player 2. Both players then receive an income of 115 tokens.
>
> *Example 2:* Player 1 has an income of 60 tokens, player 2 has an income of 80 tokens. In case of redistribution, 10 tokens are transferred from player 2 to player 1. Both players then receive an income of 70 tokens.

The voting procedure is the same as in the first part: Both players simultaneously answer the question "Do you want to redistribute?" with either "yes" or "no". Then, the computer randomly selects one of the two players, each player having the same chance of being selected. The vote of the selected player decides whether income is redistributed or not.

Before you and the other player vote on redistribution, the following information is displayed on your screens.

	1.	2.	3.	4.	5.	6.	7.	8.
Spieler	Anfangsbudget	Stimme für Umverteilung?	Budget nach 1. Umverteilung	Verfügbare Optionen	Gewählte Option	Kosten	Ertrag	Einkommen
Sie	30	nein	30	Option 1	Option 1	30	50	50
Ihr Mitspieler	70	nein	70	Option 1 & 2	Option 2	50	50	70

The top line refers to you, the bottom line to the other player. The columns provide the following information:

1. Initial budget: Budget randomly allocated at the beginning of the experiment
2. Vote for redistribution? How the respective player voted in part 1
3. Budget after 1. redistribution: Budget available for investment in part 2
4. Available options: Options the payer can afford given his budget
5. Selected option: Option selected in part 2
6. Costs: Costs of the option chosen in part 2
7. Return: Return from the option chosen in part 2
8. Income: Budget - cost + return

Unlike in the first part of the experiment, in the third part you cast a vote on redistribution not only once, but several times. The reason is that you and the other player vote before learning the outcome of the investment (i.e., the actual return from investment). More specifically, you cast a vote for **all** possible redistribution situations that may arise as a result of your investment decision in the second part. The following example illustrates this.

Example

Suppose you received a low budget of 30 tokens at the beginning of the experiment and there was no redistribution in the first part of the experiment. In the second part, you invested your entire budget in option 1. Based on this decision, different redistribution situations can occur. The next page shows two possible situations. The information that may vary from situation to situation is highlighted in red.

1. Redistribution situation

Spieler	Anfangsbudget	Stimme für Umverteilung?	Budget nach 1. Umverteilung	Verfügbare Optionen	Gewählte Option	Kosten	Ertrag	Einkommen
Sie	30	nein	30	Option 1	Option 1	30	50	50
Ihr Mitspieler	70	nein	70	Option 1 & 2	Option 2	50	50	70

2. Redistribution situation

Spieler	Anfangsbudget	Stimme für Umverteilung?	Budget nach 1. Umverteilung	Verfügbare Optionen	Gewählte Option	Kosten	Ertrag	Einkommen
Sie	30	nein	30	Option 1	Option 1	30	100	100
Ihr Mitspieler	70	nein	70	Option 1 & 2	Option 1	30	100	140

In the first situation, you got a low return of 50 tokens and hence an income of 50 tokens. In the second situation you have achieved a high return of 100 tokens and thus an income of 100 tokens. The other player chose option 2 in the first situation and received a low return of 50 tokens. Her income is equal to 70 tokens. In the second situation, she chose option 1 and received a high return of 100 tokens. Her income is equal to 140 tokens. In the first situation, redistribution means that 10 tokens are transferred to you from the other player. In the second situation, 20 tokens would be transferred to you from the other player.

In the experiment, you will be shown 4 to 8 such screens, one screen for each possible redistribution situation. In each situation, you and the other player cast a vote on redistribution. At the time of the vote, you do not know which situation is actually realized. Any of the situations can be relevant for your payout. Therefore, take enough time for each situation and think well about your decision.

At the end of the experiment you will be informed about which situation is actually implemented. The redistribution decision in this situation determines your income, which you will receive at the end of the experiment.

End of the experiment

At the end of the experiment, your income is converted at the rate 1 token = 0.15 Euro. This amount will be paid to you after the experiment. Before you receive your payment, we ask you to complete a questionnaire. For answering the questions you will receive an additional 2 Euro. Please take your time to answer the questionnaire. The payment will be made only after all participants have completed the questionnaire.

You have received a summary in addition to these explanations. Please read it now. Once you have read and understood these explanations and the summary, please press NEXT. Please hold up your hand if you have questions.

Summary

At the beginning of the experiment, all participants are randomly divided into groups of 2 players each. At the beginning of the experiment, you and the other player will receive a budget. One of you gets a high budget, the other one a low budget. The experiment consists of three parts.

In the first part of the experiment, you and the other player decide whether to remain with the budget or to redistribute. Redistribution means that both players continue to play with the same amount of money. No redistribution means that both players continue to play with the budget assigned by the computer.

In the second part of the experiment, you and the other player can invest your budget and earn more tokens. An investment in option 1 costs less than an investment in option 2. An investment in option 2 comes with a greater chance of a high return.

In the third part, you decide whether to preserve or redistribute the income distribution that has resulted from your investment. Redistribution means transferring tokens from the higher-income player to the lower-income player, such that both players receive the same income. No redistribution means that there is no income change. In this part of the experiment, you cast a vote for each redistribution situation that might result from your decision in the second part. Only then will you be informed about the actual situation.

At the end of the experiment, your income will be converted into Euro and paid out to you.

Investment options

	Option 1	Option 2
Cost of investment:	30 tokens	50 tokens
Chance of a low return (50 tokens):	80%	20%
Chance of a high return (100 tokens):	20%	80%

Possible income conditional on budget, investment option and income

Budget	Option	Costs	Return (Chance)	Income
30 tokens	Option 1	30 tokens	50 tokens (80%)	50 tokens
			100 tokens (20%)	100 tokens
50 tokens	Option 1	30 tokens	50 tokens (80%)	70 tokens
			100 tokens (20%)	120 tokens
	Option 2	50 tokens	50 tokens (20%)	50 tokens
			100 tokens (80%)	100 tokens
70 tokens	Option 1	30 tokens	50 tokens (80%)	90 tokens
			100 tokens (20%)	140 tokens
	Option 2	50 tokens	50 tokens (20%)	70 tokens
			100 tokens (80%)	120 tokens

Appendix II: Descriptive Statistics

Below, we provide an overview of the main outcome variables on the individual level (Table 2) and the group level (Table 3).

Table 2: Descriptive statistics on the individual level

	NoRED			***EndoRED***			***RED***		
	e_l	e_m	e_h	e_l	e_m	e_h	e_l	e_m	e_h
support economic incl. (% of subjects)	0.93	N/A	0.2	0.98	N/A	0.29	0.86	N/A	0.57
investment in B (% of subjects)	N/A	0.5	0.8	N/A	0.79	0.72	N/A	0.9	0.75
support income red. (% of subjects)	N/A	N/A	N/A	N/A	N/A	N/A	0.89	0.47	0.22
average income before income red.	50	80	94	61	91	103	75	92	100
average income after income red.	50	80	94	71	91	94	88	92	88

Table 3: Descriptive statistics on the group level

	NoRED	***EndoRED***	***RED***
both invest in B, given econ.incl. (% of groups)	0.1	0.68	0.9
average group income	160	182	184
equal income without income red. (% of groups)	0.1	0.56	0.6
equal income with income red. (% of groups)	0.1	0.82	1