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Leonardo Becchetti
Giacomo Degli Antoni
Stefania Ottone
Nazaria Solferino

# Spectators versus stakeholders with/without information: the difference it makes for justice

Working papers

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**Leonardo Becchetti** (University of Roma Tor Vergata)
**Giacomo Degli Antoni** (University of Milano – Bicocca)
**Stefania Ottone** (University of Milano – Bicocca)
**Nazaria Solferino** (University of Calabria-Unical)

**Abstract**

We document that being spectators (no effect on personal payoffs) and, to a lesser extent, stakeholders without information on relative payoffs, induces subjects who can choose distribution criteria after task performance to prefer rewarding talent (vis à vis effort, chance or strict egalitarianism) after guaranteeing a minimal egalitarian base. Information about distribution of payoffs under different criteria reduces dramatically such choice since most players opt or revise their decision in favor of the criterion which maximizes their own payoff (and, by doing so, end up being farther from the maximin choice). Large part (but not all) of the stakeholders' choices before knowing the payoff distribution are driven by their performance beliefs since two thirds of them choose the criterion in which they assume to perform and earn relatively better.

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**Keywords**: Distributive Justice; Perceived Fairness; Meritocracy; Talent; Chance; Effort.

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## Spectators versus stakeholders with/without information: the difference it makes for justice

### 1. Introduction

It is quite common to find reference in the popular press and in the political debate to the idea of "meritocracy". In such concept what people deserve is generally measured with reference to effort and/or talent. But what people think of different types of meritocracy[1] and does their preference for meritocracy depends on their rank in the society according to meritocratic criteria? The main goal of this paper is to give an answer to these questions with an original contribution to the existing literature.

The issue of distributive justice has a long tradition in the literature around three main fairness ideals: strict egalitarianism, libertarianism and liberal egalitarianism (Cappelen et al. 2007). Strict egalitarianism stresses that no inequalities in wealth distribution should be allowed even when people contribute in different ways to wealth creation. Libertarianism argues that individuals should be considered totally responsible for their contributions in producing wealth and a fair distribution should precisely reflect the different contributions. Liberal egalitarianism can be intended as an intermediate position as it argues that only inequalities in wealth distribution arising from factors under individual control may be accepted (Cappelen et al. 2007). When strict egalitarianism is ruled out, the debate on fairness ideals becomes essentially related to the idea of meritocracy or desert and is therefore associated to the role of talent and effort as possible criteria to determine the "merit" of people in different contexts. This is because the idea that distributions which reflect individual achievements or contributions are fair (and do not, or only partially, need to be redistributed) depends on the assumption that such achievements/contributions have been deserved by individuals. In this perspective, many researchers have analyzed from a theoretical and an empirical point of view how differences in talent, chance and effort may affect (perceived) fairness of income and wealth distribution (see section 2).

[1] Merit is actually an "empty" concept which establishes that people must have what they deserve. The criterion used to evaluate what they deserve may be effort, talent but also need. We however use such concept in the paper as in the popular meaning in which the criteria considered are generally effort and talent.

Our paper contributes to the debate on criteria of fairness and justice by carrying out an experimental and empirical analysis aimed at:

1. analyzing the criteria preferred by subjects in order to allocate resources within a society when they may choose among allocations giving different importance to proxies of talent, effort, partial or full egalitarianism, and luck;
2. verifying whether people preferences for some criteria are affected by their position and (actual or perceived) ranking and payoffs in the society according to such criteria.
3. analyzing whether subjects who choose without information about their payoffs under different criteria select the criterion they think will maximize their monetary payoffs or whether they choose according to some fairness (or, more in general, non self-interested) principles.

The main feature of our design is therefore in the combination of three elements: i) task performance aimed at determining payoff distribution in the meritocratic criteria (criteria based mainly on effort or talent); ii) direct choice of allocation criteria; iii) different role in the game: stakeholder or spectator with/without information on payoff distribution. More specifically, we identify five positions for allocators allowing them to be: i) spectators (i.e. subjects who decide allocation criteria for other players involved in the experiments without being affected for such decision in their own monetary payoffs) before knowing the distribution of outcomes in relation to each possible criterion that may be used to allocate resources; ii) spectators after knowing the distribution of outcomes in relation to each possible criterion; iii) informed stakeholders (i.e. players choosing the criterion while being part of the group of players to which the money is allocated and being informed from the beginning about the distribution of outcomes); iv) stakeholders without information on the distribution of outcomes; v) stakeholders after the information on the distribution of outcomes is given. As noticed by Konow (2003) the difference between stakeholders under ignorance and spectators is that the self interest of the former (but not of the latter) is affected by their decisions.

Our main findings document that:

1. spectators (both under ignorance or not of payoff distribution according to different criteria) and stakeholders under ignorance of payoff distribution choose to reward talent, after guaranteeing a minimal base equal for every player, significantly more than stakeholders who are informed ex ante or choose after that information is given;
2. the large majority of stakeholders (84.2 percent of them) switch to the criterion which maximizes their payoff after knowing the payoff distribution, and, more in general, stakeholders informed about the payoff distribution under different criteria tend to select the criterion that maximizes their own monetary gain;
3. In around two/thirds of cases stakeholders choices under ignorance of payoff distribution are those in which they believe to perform relatively better so that their decision may be explained by the willingness to maximize their own payoff.

The paper is divided into six sections (introduction and conclusions included). In the second section we discuss the state of art in the literature and how it relates to our paper. In the third section we present our experiment design. In the fourth section we specify the research questions inspiring our analysis. In the fifth section we provide descriptive and econometric findings aimed at answering such questions. The sixth section concludes.

## 2. The state of art

### *2.1. The theoretical contributions*

The debate on justice has a long tradition in economics (for a detailed survey see Konow (2003)).

According to Buchanan (1986)**,** among the four factors determining the distribution of claims on economic income and wealth, i.e. luck, choice, effort, and birth, only differences attributable to effort are fair. Dworkin (2000) proposes a political theory that emphasizes equality but tolerates limited inequality that he argues would follow by allowing the effect of choices to operate. He states that "individuals should

be relieved of consequential responsibility for those unfortunate features of their situation that are brute bad luck, but not from those that should be seen as flowing from their own choices" (Dworkin (2000), p. 73). Roemer (1998) stresses that the "true" meritocracy should be based on and reward only effort. The key aspect here is to be able to discriminate between chance and voluntariness, making ineffective the role of the former and allowing only choices due to voluntary people's decisions to have a role in generating different results.[2] In the Rawlsian egalitarianism (1971) a criticism of talent-based principles of justice is significant. Since talents are the consequence of a morally arbitrary natural lottery, if the casual distribution of talents were reflected by the distribution of goods or rights, then, also the final distribution of resources and the associated social structure would be morally arbitrary (see also Sacconi, 2011). According to Rawls (1971) the only acceptable solution is an equal income distribution and talented persons should be rewarded if, by using their abilities, they may improve the general situations of the society thus allowing also poorest people to improve their condition. A completely different perspective is adopted by Robert Nozick (1974). According to his entitlement theory, if a person acquires a holding without breaking the principle of justice in acquisition, or in accordance with the principle of justice in transfer,[3] then he is entitled to the holding. On this basis it is clear that interventions aimed at preventing and/or modifying acquisitions that are in accordance with these principles are not justified, even if based on some ideas of meritocracy. Finally, among other approaches to the notion of distributive justice, a central role must also be recognized to the approach based on the concepts of capabilities and functionings proposed by Sen. Sen (1999) proposes an idea of equality of opportunity to reach some essential conditions of "beings and doings" (such as being healthy, having self-respect etc.) independently from individual life plans. This idea of equality of opportunity clearly mitigates the previously stressed undesirable consequences of meritocracy.

[2] To this aim, the "relative" voluntary effort, as defined by Roemer, would be identified by considering the individual position in the effort distribution for each type, i.e. the set of not relevant characteristics and rewards should vary positively with effort and should not differ for those who exert the same effort.

[3] Nozick prefers the term "justice in holdings" instead of "distributive justice" that is not a neutral term: "Hearing the term "distribution", most people presume that some thing or mechanism uses some principle or criterion to give out a supply of things" (Nozick 1974, p. 149).

*2.2. The experimental contributions*

The role of the experimental literature in this debate has been to verify which of these visions of justice find consensus among people (not just in their survey answers but also in their actual behaviour in randomized experiments where their choices affect monetary payoffs) and how and whether their decisions change according to their (spectator, stakeholder) role in the game.

An important part of these contributions (e.g. Leventhal and Michaels, 1971; Hoffman and Spitzer, 1985; Ruffle, 1998; Burrows and Loomes, 1994) essentially show that subjects seem to perceive as fairer differences when they are based on effort or skills (for example related to quiz knowledge or search tasks) but not on luck. Other studies (e.g. Schokkaert and Lagrou, 1983; Kluegel and Smith, 1986; Overlaet, 1991) confirm that people reward individual contribution, but disregard birth, (brute) luck, and choices that do not affect productivity. In fact, in these analyses respondents choose equal splits when the descriptions of education and position suggest they do not impact on productivity, but opt for a greater contribution, and therefore a reward, when individuals exert greater effort.

To the aim and characteristics of the present contribution, it is worth referring in particular to the studies by Cappelen, Hole, Sørensen and Tungodde (2007), and by Durante and Putterman (2007). Cappelen, Hole, Sørensen and Tungodde (2007) take into consideration the three fairness ideals we mention in the introduction (Strict egalitarianism, Libertarianism and Liberal egalitarianism) in order to show how one may estimate simultaneously the prevalence of different fairness ideals and the degree of importance people attach to fairness considerations in an experiment in which participants have a stake in the outcome. The authors implement a dictator game where the distribution phase is preceded by a production phase with the latter depending on both factors within and factors beyond personal control. Authors find that participants are motivated by considerable pluralism in the fairness ideals and that liberal egalitarians and libertarians are the majority.

Durante and Putterman (2007) study the relative importance of different fairness preferences, risk aversion, and self-interest in determining support for redistribution. With their experimental design they

give subjects the opportunity to fix a tax rate and aim at studying how support for redistribution varies according to different aspects: i) whether or not the subject who decides the tax rate is part of the group affected by it; ii) whether or not the subject has perfect information on his relative position in the distribution; iii) whether or not the initial distribution depends on task performance; iv) the cost of redistribution; v) the deadweight loss related to the taxation. The authors find that: i) when subjects are impartial observers they tend always to tax in order to obtain more equalitarian distributions; ii) both the cost of taxation and the deadweight loss associated with it affect redistribution; iii) when income is not certain, higher demand for redistribution is associated with risk aversion; iv) less redistribution is supported by subjects when the initial distribution is determined by task performance.

In respect to the existing literature, our work considers a wide range of choices (in terms of distributive criteria) and positions in which decisions are taken (in terms of spectators and stakeholders with or without information about payoff distribution under different criteria) More specifically, compared to the paper by Durante and Putternam (2007), the closest to ours in terms of choices and players' positions considered, we allow players to choose directly an allocation criterion instead of expressing their preferences indirectly by choosing a tax rate ex post. In this way we may explore a parallel uninvestigated issue and verify the preferred criterion people choose to allocate resources within a group.

**3. Experimental Design and Procedure**

In what follows we describe in detail our experiment with special reference to: i) the description of different tasks on which allocation criteria chosen by players are based; ii) the position of players in the game.

A further section is devoted to the description of the socio-demographic questionnaire.

*3.1 The task and the criteria*

The task consists of distributing a sum of money (S) among N participants[4] . The sum may be allocated through seven criteria (whatever the task and the criterion selected our one is a fixed cake experiment as many other in this literature, e.g. Durante and Putterman, 2007).[5]

**Criterion 1 - LUCK**. It is based on a random draw. For each participant, the computer draws a number between 1 and 100. Each participant receives from the total sum the ratio between her own and the sum of all the numbers drawn by participants.[6]

**Criterion 2 - EQUAL**. The sum is equally distributed among the N participants. This implies that each subject receives $\frac{S}{N}$.

**Criterion 3 - EFFORT**. It is based on subjects' relative performance on a secretarial task. In particular, experimental subjects are asked to copy information about fictitious students (enrolment number, name, surname and mark) into a file. Participants are informed that the computer signals mistakes and waits for corrections, and therefore the data have to be copied in the correct way. Each participant receives part of the sum that is proportional to the number of copied lines.[7]

**Criterion 4 - TALENT**. It is based on subjects' relative performance on a pool of tasks aimed at measuring subjects' capabilities. In particular, they are asked to perform some tasks based on the WAIS-R test (the

[4] We planned sessions with 15 participants and S=210 euro, however, in a few cases, because of lack of subjects, we ran sessions with 14 subjects and S=196 or 13 subjects and S=182, see figure 1b for details on subjects and sessions across treatments.

[5] This implies that players' abilities have redistributive and not aggregate value creating effects. It may be reasonably inferred that individuals are more inclined to opt for talent and effort versus full egalitarianism if higher performance in terms of talent and effort has aggregate value enhancing effects, that is, that they are willing to accept more inequality if this helps to increase the total cake. In this sense a fixed cake experiment may be considered as the least favourable environment (among the fixed and value enhancing settings) for evaluating preferences for effort and talent.

[6] Consider N players. For each player $i \in \{1,...N\}$, the computer draws an number $e_i$. Player *i* receives $\frac{e_i}{\sum_{j=1}^{N} e_j} S$ .

[7] Consider N players. Each player $i \in \{1,...N\}$ copies a number $l_i$ of lines . Player *i* receives $\frac{l_i}{\sum_{j=1}^{N} l_j} S$ .

tasks are: finding missing details in various pictures, putting some pictures in the right order in order to create stories with logical meaning - between 3 and 6 pictures in relation to each story, to identify the analogies characterizing different pairs of words such as "car-bicycle") as well as Raven's matrices. Each participant receives part of the sum that is proportional to the number of correct answers.[8]

**Criterion 5 - PROTECTION+LUCK.** It is a mixed criterion according to which 30% of S is equally distributed among participants, while the remaining part is allocated through random draw (as criterion 1). Each participant receives a payoff that consists of both a fixed and a variable part[9].

**Criterion 6 - PROTECTION+EFFORT**. It is a mixed criterion according to which 30% of S is equally distributed among participants, while the remaining part is allocated on the basis of subjects' relative performance on a secretarial task (as in criterion 3). Each participant receives a payoff that consists of both a fixed part and a variable one[10]

**Criterion 7 - PROTECTION+TALENT**. It is a mixed criterion according to which 30% of S is equally distributed among participants, while the remaining part is allocated on basis of subjects' relative performance on a pool of tasks aimed at measuring subjects' capabilities. (as criterion 4). Each participant receives a payoff that consists of both a fixed part and a variable one[11].

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[8] Consider N players. Each player $i \in \{1,...N\}$ solves a number qi of quiz. Player *i* receives $\frac{q_i}{\sum_{j=1}^{N} q_j} S$ .

[9] The fixed and the variable parts are respectively $F_i = \frac{0.3S}{N}$ and $V_i = \frac{e_i}{\sum_{j=1}^{N} e_j} 0.7S$ .

[10] The fixed and the variable parts are respectively $F_i = \frac{0.3S}{N}$ and $V_i = \frac{l_i}{\sum_{j=1}^{N} l_j} 0.7S$ .

[11] The fixed and the variable parts are respectively $F_i = \frac{0.3S}{N}$ and $V_i = \frac{q_i}{\sum_{j=1}^{N} q_j} 0.7S$ .

The seven criteria are designed to mimic different ideas of redistribution. In particular: i) criterion EQUAL simply replicates a perfectly egalitarian society where the whole surplus is equally divided among participants, irrespective of their actions; ii) criteria LUCK, EFFORT and TALENT are aimed at mimicking scenarios where luck and/or meritocracy determine economic success; iii) the three mixed criteria – PROTECTION+LUCK, PROTECTION+EFFORT and PROTECTION+TALENT – are designed in order to mimic a society where luck or meritocracy determine wealth differences, given that each citizen is provided the basic needs (i.e. health, instruction).

Notice that the two labels assigned to the secretarial task and to the psychological test imply that we consider results from these activities as a proxy of (untalented) effort and talent respectively since our two selected tasks do not identify orthogonal measures of effort and talent. In fact, it is not possible to exclude that ability and writing speeds required to perform in the secretarial task are not affected by innate talent. On the other hand, it is plausible to suppose that a good performance in the psychological test implies a certain level of effort (also effort related to previous school or other activities through which the abilities measured by the psychological tests may be developed[12]). However, given the characteristics of the tasks (very boring and simple the secretarial task and quite based on "logical abilities" the tasks taken from the WAIS-R and the Raven's matrices), it is reasonable to assume that effort is perceived by experimental subjects more important in the secretarial task and talent more important in the psychological tests. Moreover, our analysis is essentially aimed at studying the differences between meritocracy and other distributive criteria, then the crucial point is that both the EFFORT and TALENT criterion are perceived by

[12] Raven (2000) surveys the stability and the variation in the norms for the Raven's Progressive Matrices Test (the Raven's matrices are a tool used in our experiment) for various cultural, ethnic, and socio-economic groups. Various factors seem to affect the "educative" ability (the ability to make meaning out of confusion, to produce high-level, normally nonverbal, schemata that make it simple to handle complexity), and the "reproductive" ability (the ability to absorb, recall, and reproduce information made explicit and communicated from a person to another one) that are measured by using the Raven's Matrices (Raven 2000, p.2). Among other factors, a role is played by parents' behavior concerning education, (e.g. if parents "involve their children in their own attempts to make sense of difficult situations, as they use their feelings as a basis for ''experimental'' action, as they resolve value conflicts, and as they consider the long-term social consequences of their actions" (Raven 2000, p.33)) and other experiences related for example to "the undertaking of more complex educational activity (e.g., project-based, enquiry-oriented work)" (Raven 2000, p.34). Matarazzo and Herman (1984) and Kaufman, McLean, Reynolds (1988) show that the subjects' performance in the WAIS-R test (and also in respect to the single sub-tests used in our experiment, Kaufman, McLean, Reynolds (1988)) is strictly correlated with their educational level.

subjects as based on the idea of merit (while the LUCK and EQUAL criteria should be perceived as based on other factors).

*3.2 The treatments*

The experiment consists of three treatments – STAKE, INFOSTAKE and SPECTATOR - where the distinguishing factor is either the level of information or the involvement of subjects who have to choose the criterion to be implemented (see Figures 1a and 1b). In all the treatments the task is the same - choosing among the above described criteria how to distribute a sum of money (S) among N participants. In all scenarios participants are informed that each subject is asked to indicate her preferred criterion, but at the end of the session only one subject will be randomly drawn by the computer and her choice will be implemented.

***The STAKE treatment***

In the STAKE treatment, subjects are asked to choose the criterion they want to implement both with and without information about their own payoff under the different criteria.

In the first stage they are told to define how to allocate the sum (S) and they are instructed about the seven available criteria they will have to choose among. At that point, players are provided some examples of both the secretarial task and the quiz aimed at measuring their capabilities. The aim is to let them choose without knowing their performance, but without any doubt concerning the tasks. The idea is that, if they do not know the nature of the task they will be asked to perform, each participant will develop a subjective forecast of what the activities will be. Consequently, both their decisions and their expectations will be based on uncontrolled factors.

In the second stage, participants are asked to choose the criterion they want to implement (we name the scenario in which this decision is taken “STAKE EX ANTE”; notice that the “STAKE EX ANTE” scenario is not a single treatment, but it is a choice condition within the STAKE treatment). After their choice, they

participate in the activities – they take the quiz for 15 minutes and perform the secretarial task for further 15 minutes – and the computer draws a number for each participant. Then, results are provided. In particular, each subject is informed about both her performance on the different activities and the performance of all the other players. Moreover, each participant is provided the complete payoff distribution for each possible criterion. This implies that each player perfectly knows her position within the society for each possible criterion.

In the third stage, a replay of the choice procedure is held – subjects are given the opportunity to either confirm their first choice or to change the voted criterion (we name the scenario in which this decision is taken "STAKE EX POST"). After that, the computer draws the decisive player and the payoffs are displayed (see Figure 1a).

***The INFOSTAKE treatment***

In the INFOSTAKE treatment, subjects choose the criterion only after having received information on their own payoff under the different criteria. This means that the only difference with respect to the STAKE treatment is that, after reading the instructions, players directly participate in the activities. Consequently, they choose their preferred criterion only once, after being informed about their actual ranking in each possible scenario.

***The SPECTATOR treatment***

In the SPECTATOR treatment, two types of participants are involved – A-players and B-players. In this treatment, M A-players have to allocate a sum (S) among N B-players (see Figure 1). This means that, after reading the instructions, A and B-players are involved in different activities. B-players have to perform both the secretarial task and the quiz as in the first two treatments, while A-players are asked to choose a criterion to distribute the sum (S) among B-players both before and after knowing B-players' complete payoffs distribution (we name these two scenarios respectively "SPECTATOR EX ANTE" and "SPECTATOR EX

POST"). It is common knowledge that A-players' choices affect B-players' payoffs only. At the same time, each participant knows that at the end of the session one A-player is randomly drawn by the computer and her choice made when knowing the complete payoffs distribution is implemented.

In each treatment, before exiting the session, subjects are asked to participate in a typical Holt and Laury lottery in order to elicit their risk attitudes. Finally, before receiving their payment, they fill in a socio-demographic questionnaire. These last two activities provided an extra payment and are not pre-announced to the subjects in order to avoid any kind of influence on their decisions.

In three sessions out of six in the STAKE and in the SPECTATOR treatment, an additional payment is given to players (only to B-players in the SPECTATOR treatment) as a the result of their beliefs elicitation. In particular, we asked subjects to declare how many participants they think will have a better performance under each possible criterion. They are paid on their expectation concerning the implemented criterion through the Quadratic Scoring Rule method[13].

*3.3 The questionnaire*

The questionnaire filled in by subjects at the end of the experiment is a structured questionnaire of 69 questions relative to different socio-economic aspects. It collects information about: a) socio-demographic characteristics (e.g. date of birth, sex, nationality, number of family members, etc.); b) social status (education of parents, their job, family income, etc.); c) social capital (social capital has been considered in terms of network – e.g. number of friends and acquaintances etc. -, trust – both generalized and specific trust towards some institutions such as banks, the judicial system, etc. -, and civicness – e.g. political participation, how often one reads newspapers, etc.); d) risk aversion. Compilation of the questionnaire lasts on average 30 minutes.

[13] Belief elicitation using a quadratic scoring rule is widely employed in experimental economics (see for instance Nyarko and Schotter, 2002; Offerman et al.,1996 and 2009; Bhattacharya and Pfleiderer, 1985; Holt, 1986; Selten, 1998; Huck and Weizsacker, 2002)

*3.4 The payoffs*

In each treatment, subjects' payoff is the sum of the payments obtained over the session through different activities. Both in the STAKE and in the INFOSTAKE treatment, each player *i* receives a payoff

$$P_i = \alpha_i S + \omega + RA_i$$

that consists of three elements: i) the part $\alpha_i$ of S that she receives on the basis of the implemented criterion, taking account that S = 14€*N; ii) the amount (*W* = 3€) received by each player for filling in the questionnaire; iii) the amount $RA_i \in \{0.10 \quad 1.60 \quad 2.00 \quad 3.85\}$ received as the result of the Holt and Laury lottery. In three sessions out of six in the STAKE treatment, we elicited players' beliefs. Consequently, in this case their payoff is: $P_i = \alpha_i S + \omega + RA_i + B_i$ where $B_i \in [0, \quad 1.50]$€ is the earning due to beliefs elicitation.

In the SPECTATOR treatment we have to distinguish between the two types of players. For each A-player the payoff is: $PA_i = A_i + \omega + RA_i$ where $A_i$ is the show-up fee equal to 7€ while *W* and $RA_i$ are the same as in the first two treatments. Finally, for each B-player the payoff is: $PB_i = \alpha_i S + \omega + RA_i + B_i$

*3.5 The procedure*

Overall, 265 undergraduate students of the University of Milano-Bicocca participated in the experiment (see Figure 1b). 87 participated in the STAKE treatment – and for 42 of the we elicited their beliefs concerning other players' performance. 59 participated in the INFOSTAKE treatment. 119 took part in the SPECTATOR (60 players A and 59 player B). No student took part to more than one session. We ran all the sessions at the Experimental Economic Lab (EELAB) of the University of Milano-Bicocca, Italy[14]. Decisions and performance are recorded through the computer and the experiment is programmed and conducted with Z-tree.

[14] The program was written by the programmer of the AL.EX, Dr. Marie-Edith Bissey.

Participants enter the Lab and take a seat in front of a computer. They are immediately asked to switch off their mobiles and to stop talking to their colleagues. Instructions are read by participants on their computer screen, while an experimenter reads them out loudly. They are handed out too, in order to let people refresh the criteria before taking their decisions. After subjects are informed about the task of the experiment, the criteria and the nature of the activities they will perform, a set of control questions is asked in order to be sure that players understand the rules of the game when taking decisions.

The average duration is 1 hour and a half for the STAKE and INFOSTAKE treatments and 2 hours for the SPECTATOR treatment. The complete experiment preserved anonymity among participants.

**4. Research questions**

The experimental and empirical analysis carried out in our paper aims at investigating three main research questions.

**QUESTION 1**: *What is the preferred criterion chosen by people in order to allocate a sum within a group when criteria based on meritocracy (based on talent or effort), equality and luck are allowed?*

In particular, how does the choice change when:

- **1A:** the criterion selected does not affect the payoff of subjects who make the choice (SPECTATOR treatment vs. STAKE and INFOSTAKE treatments)?
- **1B:** the decision is taken by stakeholders ignoring or not of their relative payoffs under the different criteria (STAKE EX ANTE scenario vs.: STAKE EX POST scenario, INFOSTAKE treatment, and SPECTATOR treatment)?

**QUESTION 2:** *Do subjects informed about their possible gains under the different criteria choose the criterion that maximizes their monetary payoff, behaving as the standard "homo oeconomicus" approach would predict, or do they choose by following some other ("ideal" or, more in general, not self-interested) principles ?*

**QUESTION 3:** *Do stakeholders who choose without information on their relative payoff select the criterion they think will maximize their monetary payoff or do they choose according to other (ideal) principles?*

## 5.Experimental evidence

### *5.1. Descriptive findings on socio-demographic-variables*

Tables 1 and 2 provide legend and summary descriptive findings for the main socio-demographic controls used in our empirical analysis for all participants to the experiments (including those in the SPECTATOR treatment who do not choose the criterion). They document that age variation of players is wide (more than 20 years) and around 60 percent of them are males. The average size of their households is of 3.9 members and around 25 (20) of them have a father (mother) with a University degree. Only 5 percent have an ERASMUS[15] experience while around 21 percent declare that they have lived abroad for at least more than 1 month. The average score of their school leaving examination is 78 (out of 100), while that of their university exams is 25 (18 is pass and 30 the top mark according to the Italian grading system).

When we control with Chi square, Wilcoxon and Kolmogorov Smirnov nonparametric tests the balancing properties of our three treatments we find that the null of no significant difference in distributions of socio-demographic controls is rejected in none of the three possible two-by-two combination comparisons (Table 3) at 5 percent level.

### *5.2. Results related to QUESTION 1.*

*Result 1. Two crucial factors significantly modify players' choices: a) the difference between the condition of informed stakeholder and that of spectator; b) information on payoff distribution for stakeholders. Both stakeholders under ignorance of their relative payoff and spectators tend to prefer meritocratic criteria, while stakeholders informed on their relative payoffs under the different criteria tend to prefer criteria that maximize their payoff (opting for luck and disregarding protection).*

[15] ERASMUS stands for European Region Action Scheme for the Mobility of University Students, students who participate in the ERASMUS program may spend a legally recognized period of study in a foreign University.

***5.2.1 Descriptive and statistical findings.*** A descriptive inspection on criteria chosen by players under the different treatments is provided by Table 4. In the same Table 4, we also create the following four combined choices: at least talent (which includes choices of talent or protection plus talent), at least effort (which includes choices of effort and protection plus effort), at least protection (which includes equal, protection plus effort and protection plus talent) and desert (which includes effort, talent, protection plus effort and protection plus talent).

When we analyze players' preferences, we observe that a large number of both stakeholders without information about their payoff and spectators choose "meritocracy" – specifically, protection plus talent (around 30 and 45 percent respectively) - while stakeholders who are informed (in the INFOSTAKE treatment) or have received information on their relative payoff (in the STAKE EX ANTE scenario) prefer luck (this is because, as we will see, these subjects tend to choose the criterion that maximize their payoff and the payoff distribution under the luck criterion has more variability than those under the other criteria thus allowing many subjects to maximize their payoff by precisely choosing the luck criterion, as we will show in section 5.3).[16] Among the meritocratic criteria, effort is the least preferred by both stakeholders in the STAKE ex ante scenario and spectators, while informed stakeholders almost disregard meritocratic criteria with protection. Generally, protection is strongly preferred from both stakeholders ignoring payoff distribution and spectators. Overall, very few players opt for strict egalitarianism (their share varies from 10 to 17 percent across treatments). Note as well that almost no player chooses protection plus luck (with the exception of one player in the INFOSTAKE treatment) suggesting that protection and chance are mutually exclusive in players' preferences.

In order to analyze in depth subjects' decision in respect to the different criteria, we investigate in which direction the differences in the choices operate or what choices are more or less preferred under different conditions.

[16] Note that, by having chosen this criterion ex post, there is no more uncertainty involved in such choice. We however keep on calling it random with reference to the original decision rule used to allocate the money.

We observe that two crucial factors significantly modify players' choices: a) the removal of ignorance on payoff distribution for stakeholders; b) the difference between the condition of informed stakeholder and that of spectator. In other words, there is no difference between knowledge and "removal of ignorance" – STAKE EX POST and INFOSTAKE - and not much difference between the spectators and the stakeholders in ignorance of their payoff– SPECTATOR and STAKE EX ANTE. At the same time, the "removal of ignorance" does not make a big difference for spectators (except for the effect on protection plus talent).

Effects of changes and their significance in two-by-two comparisons of different scenarios/treatments (STAKE EX ANTE, STAKE EX POST, INFOSTAKE, SPECTATOR EX ANTE and SPECTATOR EX POST) are presented in Table 5 and are discussed in detail in what follows:

i) *STAKE EX ANTE vs. STAKE EX POST* (column 1, Table 5*)*. This comparison documents the within effect of receiving information on payoff distribution under the different treatments for stakeholders. Knowing the payoff distribution reduces significantly the choice of protection plus talent (from around 30 to 4 percent), protection plus effort (from around 16 to 5 percent) and increases significantly effort (from around 8 to 20 percent) and luck (from around 6 to 32 percent) among selected choices. In terms of combined choices, after receiving information about their payoff stakeholders significantly reduce preference for protection, at least talent and desert (meritocracy).

ii) *STAKE EX ANTE vs. INFOSTAKE* (column 2, Table 5). This comparison documents the between effect of having or not information on their payoff for stakeholders. Before knowing their payoff, stakeholders opt significantly more for protection plus talent (around 30 vs. 3 percent), protection plus effort (around 16 vs less than 2 percent) and significantly less for luck (around 6 vs 42 percent). In terms of combined choices, before being informed, stakeholders prefer significantly more protection, at least talent and desert (meritocracy).

iii) *STAKE EX POST vs. INFOSTAKE* (column 3, Table 5): there are no significant differences in choices between stakeholders after having received information on payoff and ex ante informed stakeholders, that

is, “removal of ignorance” and ex ante information produce the same results in terms of stakeholders’ choices (or having been ex ante ignorant has no effect on stakeholders informed choices).

iv) *SPECTATOR EX ANTE vs STAKE EX ANTE* (column 4, Table 5): there are not strongly significant differences between stakeholders and spectators when they do not know the payoff distribution under the different criteria. The only slight difference concerns protection plus talent since a higher number of spectators choose this criterion. These findings imply that the ignorance of payoffs eliminates the differences between the spectator and the stakeholders (their choices are substantially different after having received information about payoffs (see point v), while they are not so before having the information).

v) *SPECTATOR EX ANTE vs. STAKE EX POST* (column 5, Table 5): before receiving information on payoff distribution spectators choose significantly more protection plus talent (45 vs less than 4 percent) and significantly less luck (15 vs around 32 percent) and effort (around 3 vs 20 percent) than stakeholders after having received information. Choice aggregation documents that spectators in ignorance of payoff distribution choose significantly more protection, at least talent and desert. These findings may be viewed as the combined effect of ignorance about payoff distribution plus stakeholdership.

vi) *SPECTATOR EX ANTE vs. INFOSTAKE* (column 6, Table 5): spectators under ignorance of payoff choose significantly more protection plus talent (45 vs less than 4 percent) and significantly less luck (15 vs around 42 percent) and effort (around 3 vs 17 percent) than ex ante informed stakeholders. Choice aggregation documents that spectators before receiving information on payoff distribution choose significantly more protection, at least talent and desert. These findings may be viewed as the combined effect of stakeholdership and ignorance on payoff distribution.

vii) *SPECTATOR EX ANTE vs. SPECTATOR EX POST* (column 7, Table 5): receiving information on payoffs leads spectators to chose slightly less protection plus talent (from 45 to around 33 percent - this finding is compensated by a slight increase in the equal, the luck and the protection plus effort choices).

viii) *SPECTATOR EX POST vs. STAKE EX ANTE* (column 8, Table 5): after having received information on payoffs, spectators choose significantly less talent (10 vs around 24 percent) and significantly more luck (around 18 vs around 6 percent) than stakeholders in ignorance of their payoff under different criteria. This comparison provides the net effect of the countervailing forces of ignorance and stakeholdership (vs spectatorship) and, in a sense, shows that ignorance dominates the stakeholdership effect in promoting talent.

ix) *SPECTATOR EX POST vs. STAKE EX POST* (column 9, Table 5): after having received information on their payoff under different criteria, stakeholders opt significantly less for protection plus talent (33 vs around 4 percent), but significantly more for pure effort (5 vs around 20 percent) and pure talent (10 vs around 24 percent) than spectators after having received information on payoffs. Choice aggregation documents that stakeholders who receive information choose significantly less protection (the difference is almost 40 percent) and at least talent. This comparison documents the effect of stakeholdership on the "removal of ignorance".

x) *SPECTATOR EX POST vs. INFOSTAKE* (column 10, Table 5): spectators, after having received information about payoff distribution, opt significantly more for protection plus talent (33 vs around 4 percent) and protection plus effort (13 vs around 2 percent) and significantly less for chance (18 vs around 42 percent) and effort (5 vs around 17 percent) than ex ante informed stakeholders. Choice aggregation documents that informed stakeholders choose significantly less protection and at least talent. These findings may be viewed as the combined effect of stakeholdership with information and "removal of ignorance" for spectators.

Finally, even though we do not include an explicit maximin criterion among allocating options we can indirectly check how players' decisions impact on the distance from the maximin. More specifically, we look at the change of players' choices before and after having received information on payoff distribution in the STAKE treatment and calculate the distance of the minimum player payoff in a given choice from the maximum minimum payoff achievable with one of the 7 allocating choices. Our null hypothesis that the

distance from the maximin is unchanged before and after the "removal of ignorance" on payoff distribution in the STAKE treatment is rejected (the z-stat of the Wilcoxon test -3.559, p = 0.000) documenting that the "removal of ignorance" increases the distance from the maximin. More interestingly, when we compare the spectator and the stakeholder before receiving information about payoff we find that the former is significantly closer to the maximin choices (Mann-Whitney test, z = -5.975, p = 0.000). This documents that *absence of conflicts of interest in our experimental setting is a more powerful tool than the ignorance of personal payoffs to make decision makers closer to the Rawlsian maximin criterion*.

Another indirect effect which may be measured by looking at our treatment is whether players' position and ignorance of payoffs affect through chosen criteria the distribution of income in the game. By using the standard Gini index and looking at the ten different cases described above, we find significant differences in the Gini index in three cases: 1) in the STAKE treatment, stakeholders before receiving information about payoff opt for lower (at one percent significance level) inequality according to the Gini index in respect to stakeholders after having been informed on payoffs, 2) stakeholders in the STAKE treatment before receiving information about payoffs tend to select less unequal solutions than stakeholders in the INFOSTAKE treatment (at five percent significance level) and 3) spectators before information about payoffs tend to choose less unequal distributions (at 5%) in respect to stakeholders in the STAKE treatment after having received information.

***5.2.2. Econometric findings (robustness check).*** Since our check on balancing properties among treatments is successful, tests presented above are generally deemed sufficient to verify the significance of differences in players' choices across states under the three treatments. Econometric estimates however allow to check for the significance of such states net of the impact of socio-demographic controls and, in addition to it, the correlation between such controls and players' choices.

Our strategy is to propose for each test on the significance of the difference in the choice of a given criterion between two treatments in Table 5 a corresponding regression where the significance of the treatment dummy is tested after controlling for socio-demographic variables. An added value of this check

with respect to the tests is that it gives us an idea of the economic significance (magnitude of the impact) which we can compare with descriptive findings in Table 4.

This implies that we run: a) probit regressions for both each criterion and each combination of choices on samples of two conditions at time - for a total of 100 regressions; b) OLS regressions for both each measure of inequality and each combination of choices on samples of two conditions at time - for a total of 20 regressions. Results are displayed in Table 6

Our base probit specification (estimated for each j-th criterion) is

$$CHOICE_{ij}=\alpha_{0j}+\beta_k CONDITION_{kij}+\sum_l \gamma_l CONTROLS_{lij}+\varepsilon_{ij} \quad (1)$$

where $CHOICE_{ij}$ is equal to 1 if subject *i* chooses criterion *j,* 0 otherwise; $CONDITION_{kij}$ is a dummy variable equal to 1 if the observation belongs to the control treatment (that is, the alternative treatment with which each benchmark treatment is compared); $CONTROLS_{lij}$ are socio-demografic controls and include: a gender dummy, age, the number of household members and a dummy for students having no brothers or sisters, the average score at university exam, the score at the school leaving exam, two dummies taking value one if the mother (the father) has at least a high school degree, a dummy for those attending religious services, a dummy for worker students, for those who volunteer and two discrete qualitative variables measuring the town size and income.[17]

Our base OLS specification is

$$INEQUALITY\ MEASURE_{ij}=\alpha_{0j}+\beta_k CONDITION_{kij}+\sum_l \gamma_l CONTROLS_{lij}+\varepsilon_{ij} \quad (2)$$

where $INEQUALITY\ MEASURE_{ij}$ is either the distance from the Rawlsian maximin or the Gini index and $CONDITION_{kij}$ *and* $CONTROLS_{lij}$ are defined as in (1).

Based on these specifications, the coefficient of the first cell in Table 6 can be read as the result of the regression run on the sample made by observations in the STAKE EX ANTE and STAKE EX POST scenarios. The dependent variable is the choice of the luck criterion and the control treatment is STAKE EX ANTE. The first number in the mentioned cell is the reduction of the probability of choosing the luck criterion when

[17] We also use alternatively the number of previous experiments to which the subject participated and the Holt&Laury criterion to classify risk averse, risk lover and risk neutral players. Both variables are not significant. Results are omitted for reasons of space and available upon request.

the stakeholder chooses in ignorance of payoff distribution rather than with information. The second number is the p-value.

In what follows we briefly summarize regression findings:

*i)* *STAKE EX ANTE vs. STAKE EX POST:* luck, protection plus effort and protection plus talent confirm their significance. In terms of magnitude the impact of receiving information on personal payoff is substantially similar to what found in the descriptive Table 4 in the base plus talent case (20 percent), while it remains significant but substantially lower in the other two cases. Furthermore, receiving information on payoff distribution under different criteria reduces the distance from the maximin and leads players to reduce by 47 percent criteria including protection, 27 percent those including talent and 24 percent those including desert.

*ii)* *STAKE EX ANTE vs. INFOSTAKE:* as a confirm to previous findings, before receiving information on payoffs, stakeholders choose significantly more protection plus talent (around 21 percent), protection plus effort (around 13 percent) and significantly less chance (38 percent) than ex ante informed stakeholders. This translates into a stronger preference for criteria including protection (55 percent), at least talent (31 percent) and desert (43 percent). A lower distance from the maximin for uninformed stakeholders is confirmed.

*iii)* *STAKE EX POST vs. INFOSTAKE:* we find confirmation that ex ante information or receiving information generate the same effects on stakeholders;

*iv)* *SPECTATOR EX ANTE vs. STAKE EX ANTE*: our regression confirms that the relevant difference between stakeholders and spectators before receiving information about payoffs is only in the distance from the maximin - significantly lower for spectators;

*v)* *SPECTATOR EX ANTE vs. STAKE EX POST*: we find confirmation that, before receiving information about payoffs, spectators choose significantly more protection plus talent (around 43 percent) and significantly less luck (16 percent) or pure effort (19 percent) than stakeholders after having received

information. This translates into a stronger preference for criteria including protection (55 percent), at least talent (38 percent) and desert (21 percent);

*vi)* *SPECTATOR EX ANTE vs. INFOSTAKE*: when looking at the comparison between stakeholders without information on payoffs and ex ante informed stakeholders we find that significant effects on protection plus talent and chance are confirmed with magnitudes which are quite close to those in descriptive tables. The former choose 55 percent more protection, 48 percent more talent and 45 percent more desert than the latter and their distance from the maximin is significantly lower;

*vii)* *SPECTATOR EX ANTE vs. SPECTATOR EX POST:* it is confirmed that uninformed spectators choose significantly more protection plus talent;

*viii)* *SPECTATOR EX POST vs. STAKE EX ANTE*: it is confirmed that spectators after having been informed choose significantly less talent (12 percent) and significantly more chance (7 percent) than stakeholders without information;

*ix)* *SPECTATOR EX POST vs. STAKE EX POST*: it is confirmed that differences between spectators and stakeholders who receive information about payoffs are strong. The former choose significantly more protection plus talent (24 percent) and protection plus effort (2 percent) but significantly less pure talent (17 percent) and pure effort (15 percent). Moreover, as a result of these combined differences significantly more protection (49 percent) than the latter. Finally, informed spectators are closer to the maximin;

*x)* *SPECTATOR EX POST vs. INFOSTAKE*: spectators who receive information on payoff distribution choose significantly less chance (33 percent) and significantly more base plus talent (23 percent) than ex ante informed stakeholders. This translates into a significantly stronger preference for criteria including protection (48 percent more) and desert (23 percent). Significant differences on effort and protection plus effort previously found in Table 5 are not robust to the introduction of socio-demographic controls. On the other hand, a significantly lower distance to the maximin for informed spectators emerges.

As a final check, we run the same probit and OLS regressions for both each criterion and each measure of inequality on the complete sample. In this way we may have a general idea of the overall impact of the

ignorance and of (net of) that of the given player's position (stakeholder or spectator), beyond what happens in each two-by-two treatment combinations as described in Table 6. Results are displayed in Tables 7a and 7b.

Our base probit specification is now:

$$CHOICE_{ij}=\alpha_{0j} + \alpha_1 STAKEHOLDER_{ij} + \alpha_2 EXPOST_{ij} + \alpha_3 INFOSTAKE_{ij} + \sum_l \gamma_l CONTROLS_{lij} + \varepsilon_{ij} \quad (3)$$

Our base OLS specification is now:

$$INEQUALITY\ MEASURE_{ij}= \alpha_{0j} + \alpha_1 STAKEHOLDER_{ij} + \alpha_2 EXPOST_{ij} + \alpha_3 INFOSTAKE_{ij} + \sum_l \gamma_l CONTROLS_{lij} + \varepsilon_{ij} \quad (4)$$

where $STAKEHOLDER_{kij}$ is a dummy variable equal to 1 if the allocator is a stakeholder (her payoffs are affected by her decision); $EXPOST_{kij}$ is a dummy variable equal to 1 if the choice is made after having received information on payoff distribution; $INFOSTAKE_{kij}$ is a dummy variable equal to 1 if the choice is made by an ex ante informed stakeholder and all other variables are defined as in (2).

By model construction significant results express deviations from the choice of the presumedly most disinterested player (the uninformed spectator). They show that receiving information (EXPOST) significantly adds an 18 and an 8 percent to the sample share of participants who chose luck and pure effort criteria, respectively, and significantly subtracts a 22 percent to those who chose protection plus talent (Table 7a). Moreover, and always with respect to the benchmark of the uninformed spectator, stakeholdership adds a 9 percent to the pure effort and a 13 percent to the pure talent choices, while it subtracts a 29 percent to the protection plus talent choices These findings imply that the combined effect of stakeholdership and of the "removal of ignorance of payoffs" subtracts a 50 percent of experiment participants to the sample share of those who chose protection plus talent. Finally, the condition of ex ante informed stakeholders, independently from the other two effects, subtracts a 6 percent to the protection plus effort choice. This supports the hypothesis that preference for rewarding effort is higher after than before players exert effort.

With regard to the combined criteria the "removal of ignorance" of payoffs subtracts shares of 30, 24 and 22 percent to criteria involving protection, talent and desert respectively. Finally, the stakeholder

status subtracts a 27 percent to the protection criterion. This implies that the combined effect of removal of STAKE and stakeholdership, subtracts a 57 percent to the sample share of participants who choose protection.

Overall, our first descriptive findings document some results in line with the previous literature (small preference for egalitarianism with concern however for minimal share to least advantaged and self-serving bias as documented by Konow 2000). The most relevant result is probably that ignorance of personal payoff and the position of spectators are strongly associated with the desire to reward talent but also to ensure a minimal base equal for every player.[18]

*5.3. Results related to QUESTION 2.*

*Result 2. The vast majority of(but not all) informed stakeholders choose the criterion that maximizes their payoff.*

In this section we investigate if the decision taken by stakeholders in the two treatments where they have full information about their payoffs under different criteria, that is the INFOSTAKE and the STAKE EX POST treatments, is aimed at maximizing their own payoff or if other motivational drivers matter.

As already discussed in the previous section, the preferred criterion by stakeholders in the INFOSTAKE treatment and in the STAKE treatment after having received information about payoffs is the luck one. By contrast, the criteria including protection (protection plus luck, protection plus effort, and protection plus talent) are chosen much less than the other criteria.

Table 8 shows descriptive statistics for payment distributions related to the different criteria (named pay_1 - LUCK, pay_2 - EQUAL etc.) under the two treatments. Column 3 shows the standard deviation, columns 4 and 5 the minimum and maximum value respectively, and column 6 shows how many subjects would have maximized their payoff by choosing the criterion connected to each distribution of payments. It tells us that the distribution of payments associated with the luck criterion maximizes the payoff for the

[18] This result obviously depend crucially on the choices of selected criteria and on the share of income which has to be equally divided among players in mixed criteria which involve some form or protection. It would be interesting to see whether decisions change when the share of protection is different and how this affect extreme (egalitarian, pure talent and pure effort) choices.

greatest number of subjects both in respect to the STAKE EX POST scenario and to the INFOSTAKE treatment. This is a consequence of the fact that the payoff distribution under the luck choice has more variability than those under the other criteria (see Figures 2a and 2b showing the cumulative probability related to the distributions of payments of different criteria in the STAKE EX POST and INFOSTAKE treatment).

By comparing players' decisions and their payoff in the two conditions, we find out that: 73 out of 87 subjects in the STAKE EX POST scenario and 50 out of 59 subjects in the INFOSTAKE treatment chose the payoff maximizing criterion. Both in the STAKE EX POST and in the INFOSTAKE , the criterion that was more frequently selected by subjects when they did not opt to maximize their payoff is the egalitarian one (Table 9).

In respect to the STAKE treatment, where subjects had the opportunity to revise their decision, one may wonder if the decision to maximize or not the monetary payoff is due to the value of the difference between the payoff associated with the criterion chosen ex ante and the maximum payoff ex post (if the increase in the payoff obtained by changing the criterion was low, a player could decide not to change her decision). This seems not to be the case: players who did not maximize their payoff "gave up" 1.9 euro on average, while there were 20 subjects (22.99% of the total sample of subjects in the STAKE EX POST) that decided to change the criterion even though it generated a payoff increase lower than 1.9 euro.

With regard to our second research question, we may conclude that the great majority of players (84.2%)[19] behaved, under perfect information about payoff distribution, as the standard "homo oeconomicus" approach would have predicted, by choosing the criterion only in order to maximize their monetary gain.

This behaviour is consistent with results from several studies documenting self-serving bias in fairness judgment (Forsythe et al. 1994; Hoffman et al. 1994; Babcock et al. 1996; Kagel et al. 1996; Konow 2000; Messick and Sentis 1979) even when payments are hypothetical.

[19] Among them and, in particular, in respect to the STAKE treatment, it must be considered that 13.8% of players who first choose in ignorance of their payoffs under different criteria did not need to modify their choices since their ex ante criterion proved to be the one with highest gain for them after the information about payoffs is given.

*5.4. Results related to QUESTION 3.*

*Result 3. Around 2/3 of subjects tend to choose the criterion where they believe they will obtain the highest payoff*

In this section we investigate two main strictly interrelated issues:

1) do subjects without information about their payoffs under different criteria choose the criterion that they suppose will maximize their payoff or do they choose according to some fairness ideals (that the majority of players are ready to leave as soon as the opportunity to increase their monetary payoff is evident)?
2) is the decision to opt for meritocratic criteria (and in particular the protection plus talent criterion which is the most frequently selected criterion) due to the players' belief of having the best performance in those criteria?

In order to analyze in depth these two issues, in three out of six sessions of the STAKE treatment we asked subjects their belief in their relative performances in the different criteria (except, obviously, the strict egalitarian one). In particular, we asked players to declare how many subjects they believe will perform better than themselves in each criterion.

With regard to the first issue, Table 10 shows the number of subjects who chose the different criteria (column 3) and, in respect to each criterion, the number of subjects who chose that specific criterion because of the belief that it was the one where they would have had the best relative performance (column 4). Such Table shows that 23 out of 34[20] players in ignorance of their payoff chose the criterion where they believed to have the best relative performance and then, presumably, to obtain the highest payoff. 18 out of these 23 subjects did not earn the highest payoff in the selected criterion and all of them opted for changing the criterion after having received the information about their payoff in order to maximize their monetary gain except one.

[20] Players who chose the egalitarian criterion are obviously excluded from this count since under such criterion all players obtain the same payoff by definition.

Moreover, if we consider the 11 subjects who did not choose, without information, the criterion where they believed to have the best relative performance, we notice that 8 decided to change the criterion in order to maximize their monetary gain after having been informed about the distribution of their payoffs across the different criteria.

This analysis seems to show two main results: subjects tend to choose the criterion in which they believe to obtain the highest payoff; subjects who seem to choose a criterion according to a fairness ideal, do not hesitate to change the criterion when they realize that their payoff would be higher by choosing a specific different criterion.

In respect to the second issue, Table 10 reveals that, for the great majority of players (67.74%) who chose the meritocratic criteria (effort, talent, protection plus effort and protection plus talent), the choice was associated with their belief to have the best relative performance in the selected criterion. The percentage dramatically increases when we focus on the two criteria based on talent (82.61%) and is lower when we consider criteria based on effort (25%). Moreover, 20 out of 26 subjects who opted for meritocratic criteria and did not maximize their payoff by doing so, decided to change their decision after having received the information about their payoff in order to obtain the maximum gain (this tendency is confirmed also for subjects who selected the effort criterion without believing that it was the best choice in terms of payoff: 5 out of 8 changed the criterion in order to maximize their payoff ex post). By contrast, only 3 subjects decided not to change the criterion even though it was not the maximizing one and 3 players changed the criterion without selecting the maximizing one. Even though we do not have enough data to perform econometric analysis related to the decision to change or not the criterion in relation to belief, the above mentioned evidence seems to suggest that the decision to opt for meritocratic criteria is essentially associated with a self-interested goal and not with the willingness to follow a non self-interested ideal based on fairness or other principles. This finding reinforces the idea that the spectator condition is better than the stakeholder without information about her payoff in order to generate impartial decisions.

**5. Conclusions**

In a very well known sentence Adam Smith associates justice to the sentiments of the impartial spectator, a situation in which we rarely happen to be in life.[21] We do not aim to reproduce that situation in this paper but we wonder what is the preferred criterion of a human spectator (a human allocator whose monetary payoffs are not affected by her choice) for allocating resources under different scenarios and how does it differ from that of the involved stakeholder.

We investigate this issue with a randomized experiment with choice of allocation criteria and task performance.

Our findings may be summarized by the following five considerations: i) with information about payoff distribution, third parties (spectators) reward significantly more talent but also allow significantly more for a minimal protection than stakeholders (*effect of non stakeholdership in presence of information*); ii) the absence of information about payoffs levels the differences between stakeholders and spectators (*effect of non stakeholdership in absence of information*); iii) within and between effects of the "removal of ignorance" are substantially the same for stakeholders who choose significantly more meritocratic criteria (based on talent) plus a minimum base protection without information (*effect of absence of information for stakeholders*); iv) choices of stakeholders are substantially the same if they are informed ex ante or they become informed ex post (*equivalence between "removal and absence of ignorance"*); v) the "removal of ignorance" leads spectators to reduce inequality (*effect of the "removal of ignorance" for spectators*), v) preference for rewarding effort increases after effort has been exerted; vi) the "removal of ignorance on payoffs" induces the large majority of players to change their allocation criteria for the one which maximizes their own payoff even when the extra gain is very small (less than one or two euros) and two

[21] *No man during, either the whole of his life, or that of any considerable part of it, ever trod steadily and uniformly in the path … of justice, … whose conduct was not principally directed y a regard to the sentiments of the supposed impartial spectator, of the great inmate of the breast, the great judge and arbiter of conduct.*
*– Adam Smith (1759) p. 357*

thirds of ex ante stakeholders' choices without information coincides with criteria in which they believe to have the best relative performance

Our results provides insights for normative processes in which rules concerning the distribution of resources (and characteristics of subjects who are in the better position to take decisions over such rules) within the community have to be designed. This study could, for example, contribute to identify: i) criteria aimed at defining career access in relation to public organizations (e.g. universities, local public authorities etc.) or access to public grants coherent with people's preferences on distributive justice; ii) desired attributes of those who should be in charge of defining such criteria.

Our findings clearly suggest that, if we are interested in promoting meritocracy, the best way to achieve this goal is to assign choice about allocation criteria to spectators and not to stakeholders since stakeholders (even when they ignore their relative position under different conditionss) are clearly oriented to select the criterion from which they expect to have the maximum gain.

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**Figure 1a Experimental design and procedure**

| STAKE | INFOSTAKE | SPECTATOR | |
|---|---|---|---|
| | | SUBJECT A | SUBJECT B |
| *Instructions* | *Instructions* | | *Instructions* |
| *Control Questions* | *Control Questions* | | *Beliefs elicitation* |
| *Choice of the criterion* | *Test and Secretarial Task* | | *Test and Secretarial Task* |
| *Beliefs elicitation** | *Results* | *Instructions* | *Questionnaire* |
| *Test and Secretarial Task* | *Choice of the criterion* | *Control Questions* | |
| *Results* | *Risk Aversion (Holt&Laury)* | *Choice of the criterion* | |
| *Choice of the criterion II* | *Questionnaire* | *Results* | *Results* |
| *Risk Aversion (Holt&Laury)* | | *Choice of the criterion II* | |
| *Questionnaire* | | *Risk Aversion (Holt&Laury)* | *Risk Aversion (Holt&Laury)* |
| | | *Questionnaire* | |

*** in 3 sessions only**

**Figure 1b Experimental observations**

| | Observations | Subjects for session | Ignorance of payoff distribution under different criteria | Information about payoff distribution under different criteria | Beliefs elicitation |
|---|---|---|---|---|---|
| **STAKE** | *87* | *15 subjects in 4 sessions, 14 in a session 13 in a session* | *YES* | *YES* | *YES for 42 subjects* |
| **INFOSTAKE** | *59* | *15 subjects in 3 sessions, 14 in a session* | *NO* | *YES* | *NO* |
| **SPECTATOR SUBJECT A** | *60* | *15 subjects in 4 sessions* | *YES* | *YES* | *NO* |
| **SPECTATOR SUBJECT B** | *59* | *15 subjects in 3 sessions, 14 in a session* | *-* | *-* | *YES* |

**Table 1 Variable legend**

| | |
|---|---|
| Year | Year of birth |
| Male | Dummy variable (DV) taking value one if the respondent is a male |
| LoneChild | DV taking value one if the respondent has no brothers or sisters |
| HouseMembers | Total number of respondent's household members |
| Townsize | Discrete qualitative variable for town size: 1:0-10.000 inhabitants; 2:10.001-25.000 inhabitants; 3:25.001-50.000 inhabitants; 4:50.001-100.000 inhabitants; 5:100.001-300.000 inhabitants; beyond 300.000 inhabitants; |
| Reader | Variable measuring how many times in a week the respondent reads newspapers (it takes integer values from 1 to 5). |
| Risk | Variable measuring the general willingness of the respondent in taking risk (it takes integer values from 1 to 10) |
| Catholic | DV taking value one if the respondent is Catholic |
| ChurchAttendance | Variable measuring how many times in a year the respondent usually attends a religious service |
| Volunteer | DV taking value one if the respondent is engaged in social activities as volonteer |
| MarriedParents | DV taking value one if the respondent parents are married |
| MotherEducation | DV taking value one if the respondent mother has at least high school education |
| FatherEducation | DV taking value one if the respondent father has at least high school education |
| Income | Income level of the respondent's household |
| MathGrade | The average score of the respondent's school leaving examination |
| AvgExamScore | Average score of university exams |
| Erasmus | DV taking value one if the respondent has an ERASMUS experience |
| LivAbroad | DV taking value one if the subject declared that he has lived abroad for at least more than 1 month in the past |
| StudentWorker | DV taking value one if the student is also a worker |

**Table 2. Descriptive statistics**

| Variable | Obs | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|---|
| Year | 265 | 1987.287 | 2.604 | 1970 | 1991 |
| Male | 265 | 0.604 | 0.490 | 0 | 1 |
| LoneChild | 265 | 0.132 | 0.339 | 0 | 1 |
| HouseMembers | 265 | 3.894 | 1.344 | 1 | 11 |
| TownSize | 265 | 3.298 | 1.842 | 1 | 6 |
| Reader | 265 | 1.000 | 0.000 | 1 | 1 |
| Risk | 262 | 5.935 | 1.938 | 1 | 10 |
| Catholic | 261 | 0.636 | 0.482 | 0 | 1 |
| ChurchAttendance | 264 | 2.189 | 1.246 | 1 | 5 |
| Volunteer | 264 | 0.273 | 0.455 | 0 | 2 |
| MarriedParents | 261 | 0.870 | 0.337 | 0 | 1 |
| MotherHighEducation | 265 | 0.619 | 0.486 | 0 | 1 |
| FatherHighEducation | 265 | 0.634 | 0.483 | 0 | 1 |
| Income | 253 | 2.549 | 1.059 | 1 | 5 |
| MathGrade | 252 | 78.349 | 12.142 | 43 | 100 |
| AvgExamScore | 258 | 25.050 | 3.281 | 20 | 30 |
| Erasmus | 263 | 0.046 | 0.209 | 0 | 1 |
| LivAbroad | 257 | 0.210 | 0.408 | 0 | 1 |
| StudWorker | 265 | 0.321 | 0.468 | 0 | 1 |

**Table 3. Balancing properties**

| Variables | STAKE (1) (Means) | INFOSTAKE (2) (Means) | SPECTATOR (3) (Means) | Mann-Whitney test H0: (1) = (2) (P-value) | Kolmogorov-Smirnov test or Chi2 test* H0: (1) = (2) (P-value) | Mann-Whitney test H0: (1) = (3) (P-value) | Kolmogorov-Smirnov test or Chi2 test* H0: (1) = (3) (P-value) | Mann-Whitney test H0: (2) = (3) (P-value) | Kolmogorov-Smirnov test or Chi2 test* H0: (2) = (3) (P-value) |
|---|---|---|---|---|---|---|---|---|---|
| Year | 1987.023 | 1987.288 | 1987.479 | (0.814) | (0.786) | (0.475) | (0.999) | (0.356) | (0.408) |
| Male | 0 .598 | 0.627 | 0.597 | - | (0.721) | - | (0.817) | - | (0.906) |
| LoneChild | 0.103 | 0.203 | 0.117 | - | (0.091) | - | (0.800) | - | (0.197) |
| HouseMembers | 3.988 | 4.000 | 3.773 | (0.191) | (0.693) | (0.590) | (0.988) | (0.060) | (0.138) |
| TownSize | 3.218 | 3.373 | 3.319 | (0.632) | (0.502) | (0.843) | (0.894) | (0.798) | (0.428) |
| Reader | 2.873 | 2.729 | 2.613 | (0.711) | (0.763) | (0.253) | (0.628) | (0.540) | (0.999) |
| Risk | 6.081 | 5.763 | 5.914 | (0.317) | (0.730) | (0.601) | (0.935) | (0.527) | (0.780) |
| Catholic | 0.706 | 0.627 | 0.590 | - | (0.322) | - | (0.721) | - | (0.562) |
| ChurchAttendance | 2.372 | 2.000 | 2.151 | (0.183) | (0.603) | (0.430) | (0.901) | (0.434) | (0.999) |
| Volunteer | 0.322 | 0.305 | 0.220 | - | (0.710) | - | (0.704) | - | (0.952) |
| MarriedParents | 0.873 | 0.875 | 0.864 | - | (0.980) | - | (0.467) | - | (0.502) |
| MotherHighEducation | 0.609 | 0.576 | 0.647 | - | (0.691) | - | (0.258) | - | (0.160) |
| FatherHighEducation | 0.644 | 0.593 | 0.647 | - | (0.537) | - | (0.899) | - | (0.653) |
| Income | 2.553 | 2.526 | 2.558 | (0.945) | (0.959) | (0.881) | (0.994) | (0.972) | (0.999) |
| MathGrade | 77.222 | 77.714 | 79.452 | (0.849) | (0.937) | (0.146) | (0.182) | (0.273) | (0.292) |
| AvgExamScore | 25.468 | 24.793 | 24.875 | (0.384) | (0.909) | (0.454) | (0.509) | (0.800) | (0.988) |
| Erasmus | 0.057 | 0.034 | 0.042 | (0.528) | (0.527) | - | (0.513) | - | (0.986) |
| LivAbroad | 0.247 | 0.186 | 0.195 | (0.391) | (0.390) | - | (0.062) | - | (0.324) |
| StudWorker | 0 .322 | 0.305 | 0.328 | (0.831) | (0.831) | - | (0.573) | - | (0.477) |

* For continuous variables we test - through nonparametric statistics - between-subject differences by using the Mann-Whitney test. We also test differences in the distribution through Kolmogorov-Smirnov test, while for dichotomous variables we use the Chi square test to analyse the differences in proportions .

**Table 4 Descriptive evidence on players' choices**

| | STAKE EX ANTE | | STAKE EX POST | | INFOSTAKE | | SPECTATOR EX ANTE | | SPECTATOR EX POST | | No information | | Full information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| | (1) | | (2) | | (3) | | (4) | | (5) | | (1) + (4) | | (2) + (3) + (5) | |
| Luck | 5 | 5.75 | 28 | 32.18 | 25 | 42.37 | 9 | 15.00 | 11 | 18.33 | 14 | 9.52 | 64 | 31.07 |
| Equal | 14 | 16.09 | 13 | 14.94 | 7 | 11.86 | 6 | 10.00 | 10 | 16.67 | 20 | 13.61 | 30 | 14.56 |
| Effort | 7 | 8.05 | 17 | 19.54 | 10 | 16.95 | 2 | 3.33 | 3 | 5.00 | 9 | 6.12 | 30 | 14.56 |
| Talent | 21 | 24.14 | 21 | 24.14 | 13 | 22.03 | 9 | 15.00 | 6 | 10.00 | 30 | 20.41 | 40 | 19.42 |
| Protection + luck | 0 | 0 | 1 | 1.15 | 1 | 1.69 | 2 | 3.33 | 2 | 3.33 | 2 | 1.36 | 4 | 1.94 |
| Protection + effort | 14 | 16.09 | 4 | 4.6 | 1 | 1.69 | 5 | 8.33 | 8 | 13.33 | 19 | 12.93 | 13 | 6.31 |
| Protection + talent | 26 | 29.89 | 3 | 3.45 | 2 | 3.39 | 27 | 45.00 | 20 | 33.33 | 53 | 36.05 | 25 | 12.14 |
| Total | 87 | 100 | 87 | 100 | 59 | 100 | 60 | 100 | 60 | 100 | 147 | 100 | 206 | 100 |
| | COMBINATION OF CHOICES | | | | | | | | | | | | | |
| Protection | 54 | 62.07 | 20 | 22.99 | 10 | 16.95 | 38 | 63.33 | 38 | 63.33 | 92 | 65.58 | 68 | 33.01 |
| At least talent | 47 | 54.02 | 24 | 27.59 | 15 | 25.42 | 36 | 60 | 26 | 43.33 | 83 | 56.46 | 65 | 31.55 |
| At least effort | 21 | 24.14 | 21 | 24.14 | 11 | 18.64 | 7 | 11.67 | 11 | 18.33 | 28 | 19.05 | 43 | 20.87 |
| Desert | 68 | 78.16 | 45 | 51.72 | 26 | 44.07 | 43 | 71.7 | 37 | 61.7 | 111 | 75.51 | 108 | 52.43 |

Combination of choices: Protection (Equal or protection plus talent or protection plus effort); At least talent (talent or protection plus talent); at least effort (effort or protection plus effort); Desert (talent or effort, or protection plus effort or protection plus talent).

**Table 5 The significance of the impact of different treatments on players' choices**

| | H0: STAKE ex ante = STAKE ex post | H0: STAKE ex ante = INFOSTAKE | H0: STAKE ex post = INFOSTAKE | H0 : SPECTATOR ex ante = STAKE ex ante | H0: SPECTATOR ex ante = STAKE ex post | H0 : SPECTATOR ex ante = INFOSTAKE | H0 : SPECTATOR ex ante = SPECTATOR ex post | H0: SPECTATOR ex post = STAKE ex ante | H0 : SPECTATOR ex post = STAKE ex post | H0: SPECTATOR ex post = INFOSTAKE |
|---|---|---|---|---|---|---|---|---|---|---|
| **Overall distribution[a]** | 35.210*** (0.000) | 47.286*** (0.000) | 2.385 (0.881) | 13.706** (0.033) | 45.187*** (0.000) | 38.213*** (0.000) | 10.920* (0.091) | 12.739** (0.047) | 36.437*** (0.000) | 32.821*** (0.000) |
| **Random[b] (1)** | 16.030*** (0.000) | 28.888*** (0.000) | 1.578 (0.209) | 3.528* (0.060) | 5.567** (0.018) | 10.922*** (0.001) | 0.500 (0.479) | 5.799** (0.016) | 3.495* (0.062) | 8.147*** (0.004) |
| **Protection + Effort[b] (2)** | 6.250** (0.012) | 7.905*** (0.005) | 0.896 (0.344) | 1.899 (0.168) | 0.862 (0.353) | 2.738* (0.098) | 1.290 (0.257) | 0.212 (0.645) | 3.615* (0.057) | 5.764** (0.016) |
| **Protection + talent[b] (3)** | 21.160*** (0.000) | 15.923*** (0.000) | 0.000 (0.985) | 3.519* (0.061) | 37.749*** (0.000) | 27.945*** (0.000) | 5.440** (0.020) | 0.196 (0.658) | 24.030*** (0.000) | 17.699*** (0.000) |
| **Talent[b] (4)** | 0.000 (0.999) | 0.087 (0.768) | 0.087 (0.768) | 1.825 (0.177) | 1.825 (0.177) | 0.977 (0.323) | 3.000* (0.083) | 4.734** (0.030) | 4.734** (0.030) | 3.211* (0.073) |
| **Effort[b] (5)** | 5.000** (0.025) | 2.709* (0.100) | 0.157 (0.692) | 1.372 (0.241) | 8.287*** (0.004) | 6.082** (0.014) | 0.330 (0.564) | 0.520 (0.471) | 6.387** (0.011) | 4.365** (0.037) |
| **Equal[b] (6)** | 0.050 (0.827) | 0.510 (0.475) | 0.282 (0.596) | 1.121 (0.290) | 0.771 (0.380) | 0.106 (0.744) | 2.000 (0.157) | 0.009 (0.926) | 0.080 (0.777) | 0.560 (0.454) |
| **Combination of choices** | | | | | | | | | | |
| **Protection[b] (2) + (3) + (6)** | 25.130*** (0.000) | 29.071*** (0.000) | 0.785 (0.375) | 0.024 (0.876) | 24.196*** (0.000) | 26.594*** (0.000) | 0.000 (0.999) | 0.242 (0.876) | 24.196*** (0.000) | 26.594*** (0.000) |
| **At least talent[b] (3) + (4)** | 13.560*** (0.000) | 11.770*** (0.001) | 0.084 (0.772) | 0.516 (0.473) | 15.445*** (0.000) | 14.522*** (0.000) | 10.000*** (0.002) | 1.623 (0.203) | 3.923** (0.048) | 4.225** (0.040) |
| **At least effort[b] (2) + (5)** | 0.000 (0.999) | 0.620 (0.431) | 0.620 (0.431) | 3.582* (0.058) | 3.582* (0.058) | 1.128 (0.288) | 2.000 (0.157) | 0.703 (0.402) | 0.703 (0.402) | 0.002 (0.965) |
| **Desert[b] (2) + (3) + (4) + (5)** | 13.560*** (0.000) | 17.821*** (0.000) | 0.825 (0.364) | 0.810 (0.368) | 5.879** (0.015) | 9.301*** (0.002) | 3.600* (0.058) | 4.734** (0.030) | 1.423 (0.233) | 3.698* (0.054) |
| **Distance from the maximin[c]** | -3.559*** (0.000) | 3.957*** (0.000) | 0.601 (0.548) | -5.975*** (0.000) | -1.686* (0.092) | -2.079** (0.037) | 0.545 (0.586) | 0.520 (0.603) | -7.382*** (0.000) | -7.188*** (0.000) |
| **Gini[c]** | -4.047*** (0.001) | -1.412 (0.158) | -1.223 (0.221) | 2.226** (0.0260) | 1.698* (0.089) | 2.833*** (0.0046) | 0.361 (0.718) | 1.800 (0.072) | 1.303 (0.192) | 2.236** (0.025) |

*** p<0.01, ** p<0.05, * p<0.1 a Chi square test for between-subject comparisons; Stuart-Maxwell test for within-subject comparisons

b Chi square test for between-subject comparisons; Mc Nemar test for within-subject comparisons

c Mann-Whitney test for between-subject comparisons; Wilcoxon test for within-subject comparisons

**Table 6 The significance of the impact of different treatments on players' choices (robustness check)**

| | STAKE ex ante - STAKE ex post | STAKE ex ante - INFOSTAKE | STAKE ex post - INFOSTAKE | SPECTATOR ex ante - STAKE ex ante | SPECTATOR ex ante - STAKE ex post | SPECTATOR ex ante - INFOSTAKE | SPECTATOR ex ante - SPECTATOR ex post | SPECTATOR ex post - STAKE ex ante | SPECTATOR ex post - STAKE ex post | SPECTATOR ex post - INFOSTAKE |
|---|---|---|---|---|---|---|---|---|---|---|
| **Luck** | -0.216*** (0.057) | -0.380*** (0.086) | -0.115 (0.099) | 0.032** (0.033) | -0.160** (0.075) | -0.324*** (0.103) | -0.003 (0.010) | 0.050*** (0.046) | -0.125 (0.078) | -0.334*** (0.105) |
| **Protection + effort** | 0.082** (0.045) | 0.133** (0.052) | 0.000 (0.000) | -0.062 (0.053) | 0.000 (0.000) | 0.000 (0.000) | -4.16e-07 (2.07e-06) | -0.047 (0.063) | 0.021** (0.029) | 0.037* (0.043) |
| **Protection +talent** | 0.203*** (0.059) | 0.212*** (0.067) | -1.05e-22 (3.43e-18) | 0.175* (0.102) | 0.427*** (0.090) | 0.480*** (0.091) | 0.191*** (0.069) | -0.001 (0.090) | 0.237*** (0.082) | 0.233*** (0.079) |
| **Talent** | -0.046 (0.069) | -0.041 (0.086) | 0.007 (0.088) | -0.070 (0.065) | -0.111 (0.075) | -0.085 (0.094) | 1.27e-15*** (1.08e-13) | -0.119** (0.055) | -0.168** (0.068) | -0.121 (0.083) |
| **Effort** | -0.138** (0.058) | -0.061 (0.062) | 0.070 (0.079) | -0.000 (0.000) | -0.193*** (0.059) | -0.067 (0.065) | -9.12e-06 (0.000) | 0.006 (0.040) | -0.149** (0.066) | -0.053 (0.050) |
| **Equal** | 0.031 (0.057) | 0.029 (0.057) | 0.006 (0.058) | -0.063 (0.052) | -0.042 (0.037) | -2.23e-08* (3.80e-07) | 0.000* (0.000) | 0.036 (0.074) | 0.057 (0.073) | 0.033 (0.056) |
| **Combination of choices** | | | | | | | | | | |
| **Protection** | 0.449*** (0.076) | 0.526*** (0.089) | 0.034 (0.081) | -0.028 (0.104) | 0.537*** (0.099) | 0.534*** (0.105) | -0.025 (0.078) | -0.038 (0.100) | 0.508*** (0.097) | 0.492*** (0.105) |
| **At least talent** | 0.273*** (0.082) | 0.311*** (0.099) | -0.025 (0.973) | 0.089 (0.103) | 0.383 (0.098)*** | 0.482*** (0.113) | 0.396*** (0.075) | -0.174 (0.104) | 0.130 (0.098) | 0.139 (0.112) |
| **At least effort** | -0.035 (0.078) | 0.127 (0.082) | 0.147 (0.084) | -0.105 (0.070) | -0.150 (0.072)* | -0.035 (0.078) | -0.015 (0.019) | -0.043 (0.082) | -0.081 (0.080) | 0.028 (0.085) |
| **Desert** | 0.242*** (0.080) | 0.434*** (0.101) | 0.117 (0.107) | -0.033 (0.082) | 0.213** (0.091) | 0.451*** (0.113) | 0.209*** (0.072) | -0.216** (0.093) | 0.047 (0.098) | 0.232* (0.121) |
| **Distance from the maximin** | -2.155*** (0.673) | -2.834*** (0.781) | -0.614 (0.868) | -1.821*** (0.626) | -0.996 (0.734) | -1.658* (0.937) | 0.584 (0.662) | 0.816 (0.725) | -4.290*** (0.668) | -5.310*** (0.831) |
| **Gini** | -0.067*** (0.019) | -0.043** (0.019) | 0.032 (0.022) | -0.019 (0.019) | -0.054** (0.022) | -0.030 (0.024) | 0.006 (0.017) | 0.011 (0.019) | -0.023 (0.023) | -0.008 (0.028) |

Coefficient and standard error (in round brackets) of the CONDITION variable in a regression in which the criterion in row is regressed on a set of socio-demographic controls (see equations (1) and (2) in section 5.2.2). *** p<0.01, ** p<0.05, * p<0.1.

**Table 7a. The effect of "ignorance of payoffs" and stakeholdership on players' choices**

| | Luck | Pure effort | Pure talent | Protection plus effort | Protection plus talent | Equal |
|---|---|---|---|---|---|---|
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
| Expost | 0.179*** | 0.082** | 0.010 | -0.046 | -0.223*** | 0.016 |
| | (0.045) | (0.035) | (0.047) | (0.030) | (0.049) | (0.034) |
| Info | 0.151* | -0.041 | -0.014 | -0.065*** | -0.067 | -0.019 |
| | (0.083) | (0.039) | (0.072) | (0.020) | (0.066) | (0.041) |
| stakeholder | 0.028 | 0.095*** | 0.133** | -0.007 | -0.286*** | 0.043 |
| | (0.062) | (0.034) | (0.055) | (0.030) | (0.085) | (0.033) |
| Year | -0.014 | 0.009 | -0.002 | 0.000 | 0.003 | 0.002 |
| | (0.010) | (0.007) | (0.012) | (0.006) | (0.011) | (0.008) |
| Male | 0.086 | 0.039 | 0.072 | -0.010 | -0.175*** | -0.036 |
| | (0.053) | (0.034) | (0.058) | (0.030) | (0.064) | (0.043) |
| LoneChild | 0.042 | 0.080 | -0.089 | 0.142* | 0.008 | -0.087*** |
| | (0.077) | (0.081) | (0.059) | (0.075) | (0.081) | (0.025) |
| HouseMembers | 0.008 | -0.056*** | 0.013 | -0.004 | 0.033 | 0.012 |
| | (0.024) | (0.020) | (0.029) | (0.011) | (0.028) | (0.019) |
| TownSize | -0.028* | 0.001 | 0.038** | -0.004 | 0.018 | -0.002 |
| | (0.014) | (0.010) | (0.016) | (0.009) | (0.015) | (0.009) |
| Reader | -0.024 | 0.007 | -0.012 | 0.002 | 0.033* | -0.020 |
| | (0.019) | (0.014) | (0.023) | (0.009) | (0.020) | (0.013) |
| Risk | 0.010 | -0.000 | -0.000 | -0.022*** | 0.028** | 0.001 |
| | (0.012) | (0.010) | (0.014) | (0.008) | (0.012) | (0.008) |
| Catholic | -0.017 | 0.021 | 0.066 | 0.055** | -0.083 | -0.066 |
| | (0.065) | (0.048) | (0.069) | (0.025) | (0.080) | (0.057) |
| ChurchAttendance | -0.019 | -0.014 | -0.027 | -0.019 | 0.035 | 0.046*** |
| | (0.024) | (0.019) | (0.028) | (0.013) | (0.025) | (0.016) |
| Volunteer | 0.032 | 0.012 | -0.083 | 0.008 | 0.004 | -0.019 |
| | (0.051) | (0.034) | (0.059) | (0.034) | (0.051) | (0.031) |
| MarriedParents | -0.135 | | -0.017 | 0.023 | -0.048 | -0.042 |
| | (0.123) | | (0.090) | (0.036) | (0.106) | (0.083) |
| MotherHighEducation | -0.076 | 0.065 | 0.155** | -0.015 | -0.075 | -0.099* |
| | (0.060) | (0.047) | (0.060) | (0.040) | (0.070) | (0.051) |
| FatherHighEducation | -0.011 | -0.107* | 0.014 | 0.012 | 0.096* | -0.019 |
| | (0.056) | (0.057) | (0.060) | (0.028) | (0.053) | (0.033) |
| Income | -0.015 | 0.026 | 0.027 | -0.037** | -0.052* | 0.052*** |
| | (0.026) | (0.021) | (0.030) | (0.015) | (0.029) | (0.017) |
| MathGrade | -0.002 | -0.001 | 0.006** | 0.001 | -0.001 | -0.001 |
| | (0.002) | (0.002) | (0.003) | (0.001) | (0.002) | (0.002) |
| AvgExamScore | -0.006 | -0.002 | 0.025* | -0.006 | -0.009 | -0.002 |
| | (0.009) | (0.006) | (0.013) | (0.005) | (0.010) | (0.006) |
| Erasmus | 0.002 | 0.014 | 0.097 | | 0.189 | -0.037 |
| | (0.127) | (0.091) | (0.147) | | (0.213) | (0.046) |
| LivAbroad | -0.023 | -0.002 | 0.001 | -0.016 | -0.128*** | 0.168* |
| | (0.069) | (0.046) | (0.082) | (0.036) | (0.043) | (0.088) |
| StudentWorker | -0.044 | 0.019 | 0.025 | 0.025 | -0.038 | 0.012 |
| | (0.055) | (0.039) | (0.062) | (0.036) | (0.052) | (0.039) |
| Wald $\chi 2$ | 60.96 | 30.85 | 33.48 | 51.09 | 77.05 | 58.88 |
| (p- value) | (0.00) | (0.07) | (0.05) | (0.00) | (0.00) | (0.00) |
| Observations | 267 | 244 | 267 | 254 | 267 | 267 |

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. standard errors clustered at individual and session level.

**Table 7b The effect of "ignorance of payoffs" and stakeholdership on combined players' choices**

| | Protection | At least effort | At least talent | Desert | Distance from Rawls | Gini |
|---|---|---|---|---|---|---|
| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
| Expost | -0.303*** | 0.030 | -0.242*** | -0.223*** | 1.264** | 0.040*** |
| | (0.064) | (0.046) | (0.060) | (0.057) | (0.501) | (0.013) |
| Info | -0.174* | -0.133** | -0.046 | -0.174* | 1.217 | -0.007 |
| | (0.094) | (0.054) | (0.099) | (0.097) | (0.803) | (0.020) |
| Stakeholder | -0.274*** | 0.083 | -0.177* | -0.090 | 0.491 | 0.033** |
| | (0.082) | (0.054) | (0.094) | (0.085) | (0.587) | (0.014) |
| Year | 0.003 | 0.007 | 0.007 | 0.015 | -0.084 | -0.002 |
| | (0.017) | (0.011) | (0.016) | (0.015) | (0.113) | (0.003) |
| Male | -0.262*** | 0.018 | -0.080 | -0.045 | 1.441*** | 0.035** |
| | (0.075) | (0.052) | (0.086) | (0.078) | (0.547) | (0.013) |
| LoneChild | -0.005 | 0.190* | -0.107 | 0.105 | 0.840 | 0.020 |
| | (0.098) | (0.106) | (0.101) | (0.086) | (0.679) | (0.018) |
| HouseMembers | 0.043 | -0.051* | 0.044 | -0.009 | -0.189 | -0.020 |
| | (0.039) | (0.026) | (0.042) | (0.037) | (0.265) | (0.007) |
| TownSize | -0.004 | -0.006 | 0.050** | 0.043** | -0.154 | -0.004 |
| | (0.022) | (0.015) | (0.023) | (0.019) | (0.152) | (0.004) |
| Reader | 0.019 | 0.005 | 0.039 | 0.041 | -0.112 | -0.006 |
| | (0.028) | (0.018) | (0.029) | (0.026) | (0.187) | (0.005) |
| Risk | -0.008 | -0.029** | 0.024 | -0.006 | 0.152 | 0.003 |
| | (0.018) | (0.015) | (0.020) | (0.017) | (0.120) | (0.003) |
| Catholic | -0.090 | 0.085 | 0.018 | 0.108 | 0.305 | 0.001 |
| | (0.101) | (0.061) | (0.103) | (0.099) | (0.677) | (0.017) |
| ChurchAttendance | 0.085** | -0.037 | -0.008 | -0.042 | -0.500** | -0.015** |
| | (0.036) | (0.026) | (0.039) | (0.032) | (0.244) | (0.006) |
| Volunteer | 0.010 | 0.038 | -0.064 | -0.029 | 0.332 | 0.007 |
| | (0.075) | (0.056) | (0.076) | (0.072) | (0.467) | (0.012) |
| MarriedParents | -0.043 | 0.134** | -0.054 | 0.120 | -0.667 | 0.007 |
| | (0.120) | (0.066) | (0.152) | (0.150) | (0.993) | (0.021) |
| MotherHighEducation | -0.201** | 0.065 | 0.088 | 0.151* | 0.214 | -0.007 |
| | (0.093) | (0.068) | (0.094) | (0.085) | (0.641) | (0.018) |
| FatherHighEducation | 0.099 | -0.088 | 0.129 | 0.028 | -0.077 | 0.005 |
| | (0.076) | (0.064) | (0.083) | (0.075) | (0.545) | (0.013) |
| Income | -0.034 | -0.022 | -0.019 | -0.046 | -0.179 | -0.006 |
| | (0.040) | (0.032) | (0.042) | (0.037) | (0.271) | (0.007) |
| MathGrade | -0.005 | 0.000 | 0.005 | 0.004 | 0.016 | -0.001 |
| | (0.003) | (0.002) | (0.004) | (0.003) | (0.022) | (0.000) |
| AvgExamScore | -0.015 | -0.010 | 0.026 | 0.010 | -0.001 | -0.002 |
| | (0.015) | (0.009) | (0.019) | (0.014) | (0.122) | (0.003) |
| Erasmus | -0.096 | -0.097 | 0.185 | 0.084 | 1.166 | 0.037 |
| | (0.164) | (0.091) | (0.184) | (0.129) | (1.418) | (0.044) |
| LivAbroad | 0.027 | -0.040 | -0.152 | -0.197* | -1.011 | -0.026 |
| | (0.111) | (0.061) | (0.118) | (0.119) | (0.886) | (0.021) |
| StudentWorker | -0.026 | 0.019 | -0.002 | 0.005 | -0.145 | -0.009 |
| | (0.085) | (0.061) | (0.086) | (0.082) | (0.592) | (0.014) |
| Wald $\chi 2$ | 67.87 | 26.78 | 50.84 | 61.95 | | |
| (p- value) | (0.00) | (0.21) | (0.00) | (0.00) | | |
| $R^2$ | | | | | 0.144 | 0.151 |
| Observations | 267 | 267 | 267 | 267 | 267 | 267 |

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. standard errors clustered at individual and session level.

**Table 8 Distribution of payments in the STAKE ex post and INFOSTAKE treatments**

| Treatment | Variable | Std. Dev. | Min | Max | Number of subjects who maximize their payoff[22] |
|---|---|---|---|---|---|
| **STAKE ex post (N = 87)** | pay_1 – LUCK | 8.54 | .4 | 37.1 | 34 |
| | pay_2 – EQUAL | 0 | 14 | 14 | 13 |
| | pay_3 – EFFORT | 3.69 | 4.8 | 24.8 | 20 |
| | pay_4 – TALENT | 4.07 | 5.3 | 21.6 | 21 |
| | pay_5 – PROTECTION+LUCK | 5.97 | 4.5 | 30.2 | 0 |
| | pay_6 – PROTECTION+EFFORT | 2.58 | 7.6 | 21.6 | 2 |
| | pay_7 – PROTECTION+TALENT | 2.85 | 7.9 | 19.3 | 1 |
| **INFOSTAKE (N = 59)** | pay_1 – LUCK | 7.93 | .7 | 33.5 | 27 |
| | pay_2 – EQUAL | 0 | 14 | 14 | 6 |
| | pay_3 – EFFORT | 3.34 | 6.1 | 22.2 | 10 |
| | pay_4 – TALENT | 3.61 | 6.4 | 20.4 | 16 |
| | pay_5 – PROTECTION+LUCK | 5.54 | 4.7 | 27.6 | 0 |
| | pay_6 – PROTECTION+EFFORT | 2.34 | 8.5 | 19.8 | 1 |
| | pay_7 – PROTECTION+TALENT | 2.54 | 8.7 | 18.5 | 0 |

**Fig. 2a Cumulative probability related to the distribution of payments of different criteria in the STAKE ex post treatment**

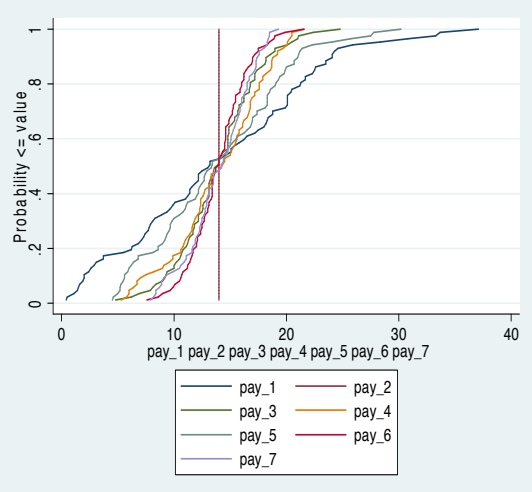
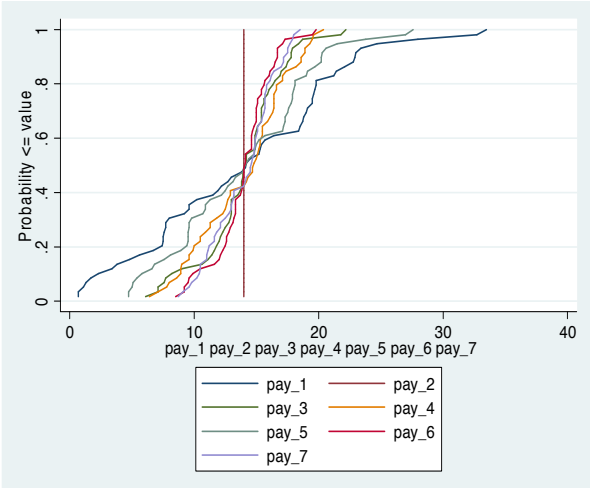



**Fig.2b Cumulative probability related to the distribution of payments of different criteria in the INFOSTAKE treatment**




[22] In case for a subject two or more criteria gave the same maximum payoff, we took into consideration and included in the table all those criteria.

**Table 9 Subjects choosing a non-maximizing criterion**

| Treatment | Criterion | Number of times the criterion was selected without maximizing the payoff |
|---|---|---|
| STAKE ex post (number of obs. 87) | LUCK | 1 |
| | EQUAL | 6 |
| | EFFORT | 3 |
| | TALENT | 4 |
| | PROTECTION+LUCK | 1 |
| | PROTECTION+EFFORT | 3 |
| | PROTECTION+TALENT | 3 |
| INFOSTAKE (number of obs. 59) | LUCK | 1 |
| | EQUAL | 4 |
| | EFFORT | 2 |
| | TALENT | 2 |
| | PROTECTION+LUCK | 1 |
| | PROTECTION+EFFORT | 1 |
| | PROTECTION+TALENT | 2 |

**Table 10 Criterion chosen by players and related belief**

| **Treatment** | **Criterion** | **Number of times the criterion was selected** | **Number of players who selected by following the maximizing rule** |
|---|---|---|---|
| **STK ex post (N = 42)** | LUCK | 3 | 2 |
| | EQUAL | 8 | |
| | EFFORT | 1 | 0 |
| | TALENT | 9 | 8 |
| | PROTECTION+LUCK | 0 | 0 |
| | PROTECTION+EFFORT | 7 | 2 |
| | PROTECTION+TALENT | 14 | 11 |