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Abstract

We experimentally study the effects of different types of market experience on the efficiency levels attained in a subsequent social dilemma. Our motivation stems from the existence of contrasting views on the potential spillover effects of participation in markets on non-market activities requiring cooperation. In our set-up, market interaction takes place in a continuous double auction involving a short and a long side of the market. This feature represents the very unequal opportunities that exist in some markets. Our focus is on the comparison of the efficiency levels attained in a subsequent social dilemma by pairs of individuals who were on the short side of the market, market-winners, with that of individuals who were on the long side, market-losers. We study both the cases where interaction in the social dilemma is with others from the same market, Market-Partners, and where it is with others from another market, Market-Strangers. We compare the efficiency of cooperation with and without market experience controlling for earnings, allowing us to identify the causal effects of market interaction. The results show that the experience of market interaction has a negative effect on cooperation efficiency in Market-Partners. This holds for both market-losers and market-winners pairs. By contrast, for Market-Strangers we find the positive effect that market-winner pairs tend to achieve higher cooperation efficiency than in the absence of previous market interaction.

Keywords: Competition, Cooperation, Experiments

JEL: A13, C92, D30, J50, M50

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1 Introduction

Market competition is commonly considered to be a beneficial force and there is no doubt that competitive markets are important for the efficient allocation of resources. This is demonstrated theoretically in the First and Second Welfare Theorems (see, e.g., Mas-Colell et al., 1995) and shown empirically in many field studies and in experiments with double auctions and other competitive market institutions (see Smith, 1962, for the seminal paper and Davis and Holt, 1993, for a survey). However, an important question is whether the efficiency effects of markets are not circumscribed to the market environment itself but spill over and affect efficiency in other spheres of social and economic interaction. This is especially relevant in relation to interactions through personal exchange where cooperation can not be completely regulated through formal contracts. In this paper we study this, by exploring whether, and if so how, highly competitive market experience affects the efficiency of cooperation in a social dilemma situation outside the market environment.

Spillover effects may interact with the conditions under which agents interact in competitive markets. A salient feature of modern market societies is that the productive assets – including human capital – are distributed rather unequally (see, e.g., Cowell and Van Kerm, 2015). As a consequence, some people’s skills or assets are in high demand in the market, with many others trying to transact with them, while those of others are in much lower demand. Some people may even have difficulties to trade at all. Moreover, for many individuals being in a favorable or unfavorable market situation will be constant over their life-time; often it even carries over between generations (Restuccia and Urrutia, 2004; Black et al., 2005). The most prominent case of such situations are labor markets where a large number of low-skilled workers compete for a limited number of jobs, implying relatively low wages and few opportunities to trade their labor (e.g., Marquis et al., 2014). In contrast, much demanded high-skilled workers (e.g., in the financial sector) can easily trade their labor and earn relatively high incomes. The question is whether such different market experiences affect the efficiency of cooperation in social dilemma situations.

Another important circumstance that may matter for the efficiency of cooperation outside the market is whether agents are immersed into a social dilemma situation with somebody they have to compete with in the same market or whether competition is experienced with somebody else. For instance, the voluntary provision of a local public good may be affected differently in low income neighborhoods where neighbors have to compete fiercely for jobs on the same labor market compared to high income neighborhoods where neighbors are unlikely to be direct competitors on the labor market.

We use laboratory experiments to address these questions because experiments allow us to obtain causal evidence about if and how competitive market experience affects the efficiency

of voluntary cooperation outside the market. Specifically, we compare behavior in a social dilemma game that is preceded by competitive market interaction under different conditions with behavior in the absence of market interaction. In our study, market interaction takes place in a highly competitive continuous double auction (see Smith, 1962). We use this market institution because it has been shown to consistently converge to the efficient Walrasian outcome and does so through a decentralized equilibrating process in which bids and offers are made and prices and transactions emerge over time (see, e.g., Davis and Holt, 1993). It is the effect on cooperation of having experienced such highly competitive and efficient markets we are interested in.¹

We designed the experiment such that it allows us to study (i) the general effect of competitive market experience and (ii) the two specific dimensions of spillover effects introduced above. First, we can investigate if and how effects differ depending on whether people are on the favorable or unfavorable side of a market. We achieve this by using the so-called box-design of a market that involves a long and a short side of the market with inelastic supply and demand curves (Holt et al., 1986). This market institution implies that individuals on one side of the market will easily make transactions at favorable prices, whereas individuals on the other side of the market will have difficulties to make transactions and will do so at unfavorable prices, if they transact at all. This feature represents in a stark way the very unequal opportunities that exist in some market economies or market segments (e.g., labor markets for high and low skilled workers).²

The second dimension of market experience that we study relates to whether people have to overcome the social dilemma problem together with people with whom they have had or have not had a joint market experience. It may make a difference whether someone has, for example, to supply a local public good jointly with a neighbor who is competing for the same job or customers, or with somebody who is not a direct competitor on the market. Similarly, in a social dilemma situation, people may behave differently towards somebody on the other side of the same market (e.g., a potential employer, employee, customer or shopkeeper) than towards somebody who is also on the other market side but one has no direct market experience with (and will also not have in the future).

In the markets we investigate, earnings differentials among agents will arise endogenously from market interaction as a consequence of different trading opportunities. Thus, there will be ‘market-winners’ with high earnings from market interactions and ‘market-losers’ with low

¹Needless to say that this does not imply that we consider other market institutions or other competitive environments to be uninteresting. Quite to the opposite. However, being the first study exploring competitive market experience on non-market cooperation we chose an institution that (a) is undisputed in being a good reflection of decentralized market behavior and (b) does avoid potential confounds due to structural market imperfections and inefficiency (e.g., oligopolistic markets).

²Less stark representations of unequal market opportunities are conceivable. We consider our implementation as a starting point providing benchmark results for other ‘less extreme’ market inequalities.

earnings. Our main interest is how different market experiences affect behavior in a social dilemma game keeping everything else equal. We therefore control for earnings differences as explained further below. This will also allow us to test if market interaction as such affects behavior in a social dilemma situation.

In the literature on the efficiency of cooperation public goods games are a standard tool (Chaudhuri, 2011; Kagel and Roth, 2012). The social dilemma we investigate is a repeated two-person public goods game in which pairs are fixed throughout all rounds. To study the first dimension of differences in market experience, we implement in the social dilemma game different pairings of participants from the same and opposite market sides. This allows us to explore how, respectively, pairs of market-losers, market-winners and mixed pairs are affected in their efficiency of cooperation. To study the second dimension, we vary whether pairings in the social dilemma game come from the same market or from different markets. For convenience we will refer to the former case as Market-Partners and the latter case as Market-Strangers. We also explore interaction effects between these two dimensions of market experience. Finally, within the context of our experiment, our set-up makes it possible to distinguish between the short-run and the long-run impact of market interaction.

Our study of possible spillovers of market competition relates to the broader issue of the influence of institutions on economic and social motivations, which is an under-explored topic in economics (Fehr and Hoff, 2011). For instance, van Winden (2012) argues that to understand economic and social interactions one needs to take into account the existence and dynamics of social ties between people and how they are affected by the context in which these interactions take place. Bowles and Polania-Reyes (2012) present an extensive survey of the evidence documenting that social motivations are not necessarily separable from the environment and experiences related to the environment.

Our experimental design is motivated by two prevalent but contrasting views on the potential spillover effects of markets on non-market activities requiring cooperation. Vernon Smith (1998) builds on Adam Smith to postulate that people intuitively know how to behave both in a cooperative and in a competitive way depending on the context. According to this view, both behaviors grow out of a universal propensity for social exchange which “finds expression in both personal exchange in small-group social transactions and in impersonal trade through large-group markets.” (Smith, 1998, p.3) Smith sees cooperative and non-cooperative behavior as peacefully coexisting, with efficiency in impersonal markets being based on competitive behavior, while efficiency in personal social exchange requires the ability to find ways to engage with others to avoid free-riding. This view implies that market experience should not affect behavior outside the market.

Henrich et al. (2001) extend this argument and suggest that market interaction can have positive effects on cooperation. They study behavior in ultimatum games, public good games

and dictator games in 15 small-scale societies with a variety of economic and cultural conditions and relate the results to a non-experimental measure of market integration. They find that “the higher the degree of market integration (...) the greater the level of cooperation in experimental games.” (Henrich et al., 2001, p.74) The rationale for this relation proposed by these authors is that “the more frequently people experience market transactions, the more they will also experience abstract sharing principles concerning behaviors towards strangers (...).” (Henrich et al., 2001, p.76) This is consistent with the notion of *doux commerce* as put forward among others by Montesquieu (1748) already in the eighteenth century.

In contrast, Bowles (1998) suggests that market participation can adversely affect people’s personality. Specifically, he argues that “(...) there are significant differences in the personality effects on participants in markets (...) for people on the short side (...) and those on the long side of the market, some of which are simply excluded from the exchange process, while others fear losing the transactions they have secured.” (Bowles, 1998, p.78) Bowles’ concerns can be seen as part of the broader question asking whether market exchange erodes moral and civic goods worth preserving. Sandel (2012, 2013), for instance, argues that certain market exchanges are objectionable on moral grounds and may also crowd out non-market norms.³ This view implies an adverse affect of market experience on the efficiency of cooperation outside the market, especially for market-losers.

A priori the diverging views on potential spillover effects of market participation are both reasonable and empirical evidence is necessary to ascertain their relative merit. If the negative spillover effects of market participation discussed by Bowles indeed depress the efficiency of voluntary cooperation this would be a major challenge for societies in which markets play a central role.⁴ However, as mentioned above, there are also reasons to believe that market participation is innocuous or is even beneficial for the efficiency of non-market interactions. With our study we want to contribute to shedding light on this important issue. To the best of our knowledge this is the first study doing this.

In the field non-market interactions are affected by a multitude of factors which makes it difficult to tease out the effect of market experience on the basis of field data. The use of laboratory experiments makes it possible to study spillover effects of market participation with a high degree of control under *ceteris paribus* conditions. Specifically, we are able to exogenously assign participants to the two sides of the market. Without laboratory control naturally more cooperative people might be over-represented on one or the other side. Similarly, we are able to control the composition of the groups in the subsequent social dilemma

³For a survey of different views of the market society, see Fourcade and Healy (2007).

⁴Our focus is on spillover effects on efficiency, because they are more directly economically relevant. However, spillover effects could also be on psychological dimensions like efficacy as captured in the Rotter score (see Rotter, 1966) or social dominance orientation (see Sidanius and Pratto, 2004).

and, hence, study behavior for all possible matchings between participants with different market experiences.⁵

Our experimental set-up includes both market treatments and non-market treatments. We will directly compare behavior in market treatments with that in non-market treatments. A crucial feature of our experimental design is that it includes non-market treatments in which participants without market experience are endowed with earnings that are on average equal to the market earnings made by participants with market experience. This allows us to separate the effects of being a market-loser or market-winner, from that of just obtaining higher or lower earnings. As different market positions inevitably are associated with different earnings potentials, this separation would be virtually impossible with field data.

We find that market experience can affect the efficiency of cooperation outside the market and that the precise strength and direction of the spillover effect depends on specific market circumstances. For Market-Partners competitive market experience has adverse effects on the efficiency of cooperation in both market-winner and market-loser matchings. In stark contrast, in Market-Strangers, matchings of market-winners manage to cooperate more efficiently than comparable matchings without market experience. Having competed for scarce resources on *the same side of the same market* depresses efficiency in the social dilemma. Indeed, in Market-Partners, market-loser matchings and market-winner matchings contribute similarly and both types of matchings (tend to) contribute less than mixed matchings composed of one market-winner and one market-loser. By contrast, positive market experience can foster cooperation, albeit only for those who did not have to compete on the same market with each other before. Specifically, in Market-Strangers we find that the interaction of market-winners leads to higher efficiency than that of market-losers.

A crucial feature of our results is that the differences in cooperation levels cannot be explained by differences in earnings. Hence, we can attribute differences in cooperation levels in a causal sense to different market experiences in the different cases we study. We also take self-assessed measures of experienced well-being and incentivized measures of social value orientation. Our results suggest that market experience affects both subjective well-being and social value orientation negatively.

2 Related Experimental Literature

There are a number of related experimental papers studying the effect of competition on behavior, but none of them deals with how interaction in competitive markets affects subsequent efficiency in cooperation.

⁵Another advantage of lab experiments is the possibility of replication which allows for a systematic study of the relevant issues. See Falk and Heckman (2009) for a methodological discussion of the relevance of laboratory experiments in the economic and social sciences.

Bauernschuster et al. (2013) study how competition between two investors interacts with trust and trustworthiness in simple one-shot trust games. They find that competition among trustors does not significantly increase sent amounts. However, trustees react to competition between trustors by lowering return ratios. Similarly, Huck et al. (2012) study a repeated binary trust game that resembles a market for an experience good with a fixed price where the buyer can choose whether to trust or not and the seller can only choose quality. Without competition, buyers are in each period randomly assigned to sellers. With competition, buyers choose in each period the seller from whom they want to buy. The authors report that the introduction of competition is highly effective, with market efficiency rising from 30 to over 80 percent.

Herz and Taubinsky (2017) study how experience with competition shapes fairness standards. In their experiment participants first take part in ultimatum games with either proposer or responder competition and then play the standard ultimatum game. They find that responders' acceptance thresholds are higher for responders that started in the game with proposer competition than for those who started in the game with responder competition.

Carpenter and Seki (2006) report on a field experiment conducted with three groups of workers from a fishing community in Japan, where the different groups were exposed to different amounts of competition on-the-job. The results show that these differences explain differences in cooperation in an experimental setting. Specifically, fishermen and traders, who interact in more competitive environments are significantly less cooperative than staff who faces little competition on the job.

Falk and Szech (2013) study behavior in a context in which market exchange can produce a negative externality – in their case the death of mice. They find that repeated market interaction typically yields less socially responsible behavior than one-shot non-market behavior. Bartling et al. (2015) present a comparison of social concern between Switzerland and China. They study behavior in both a non-market and a market context. They find that in both countries subjects exhibit less social concern in a market than in a non-market environment. In addition, they find that while there is no cross-country difference in behavior in a non-market context, in a market context social concern is lower in China than in Switzerland.

Three studies explore the effects of different degrees of competition on behavior. Two of these compare the effects of interacting under respectively tournament and piece-rate incentives of subjects on Amazon Mechanical Turk on subsequent behavior. Buser and Dreber (2016) find that individuals are significantly less cooperative in a public goods game after having interacted under tournament incentives than under piece-rate. Chen (2011) compares the effects of interacting under competitive and piece-rate conditions on charitable donations and finds that a competitive environment leads to higher donations. Brandts et al. (2009)

study the effects of rivalry in a non-market setting on the disposition towards others and on subjective well-being. They use a finitely repeated prisoner’s dilemma game between fixed triads of players, where one of the three players can in each round choose with whom of the other two players to interact, leaving the third player without interaction. The results show that rivalry affects individuals differently, depending on which side of the rivalry they are on. It negatively affects experienced well-being of those on the powerless side of the interaction and has a positive effect for the powerful player leading to a larger inequality in experienced well-being. Interacting under rivalry also affects negatively the disposition towards others. Interestingly, the efficiency of cooperation is the same in conditions with and without rivalry.

Our focus and set-up is quite different from the cited studies. We investigate the efficiency effects of experienced competition in markets with very unequal participation opportunities.⁶ In our view markets deserve special attention by researchers because they are widespread and the most prominent mechanism involving competition at the societal level. In comparison to other studies our design is more complex, which allows us to investigate factors typical for markets that have not been explored earlier. Specifically, we can analyze the effect of asymmetric positions in the market (market-losers vs market-winners) and the effect of more or less common experience of market competition (Market-Partners vs Market-Strangers). Finally, another important element of our research design is that we control for the effects of differential earnings, which allows us to identify the pure effect of market interaction.

It is our conviction that the impact of competitive market experience can be quite distinct from that of other competitive environments. Moreover, competitive markets are of special socio-economic importance and their potential spillover effects need to be studied in depth. We are not aware of any other experimental work on the matter.

3 Experiment Design

Our design has two main building blocks: (1) a highly competitive continuous double auction market (hereafter, DAM) and (2) a social dilemma game (hereafter, SDG). We have data from four main treatments, two market treatments in which the DAM is played before the SDG, and two non-market treatments, consisting of three conditions each, that control for earnings achieved in the market phase of the market treatments. All treatments also involve two measurements of subjective well-being and of social value orientation. We first describe in detail the two market treatments followed by a description of the two non-market treatments.⁷

⁶A situation reminiscent of the notion of the reserve army of labor introduced by Engels (1845). Some observers, see e.g. Standing (2011), consider that in modern globalized economies there now exists a new reserve army of labor, comprised of temporary and part-time workers, who lack any type of job security.

⁷The experiment instructions can be found in Appendix B.

3.1 Market Treatments

Both market treatments consisted of eight parts. Table 1 shows the sequence of events. At the very beginning, participants were informed that the experiment would have several parts. Instructions for the various parts were given separately for each part, except those for parts 3 and 4 which were presented together.

Table 1. Sequence of events in market treatments

1.	Self-assessment of subjective well-being	(SWB 1)
2.	Measurement of social value orientation	(SVO 1)
3.	Double auction market (18 rounds)	(DAM)
4.	Social dilemma game (6 rounds)	(SDG)
5.	Self-assessment of subjective well-being	(SWB 2)
6.	Measurement of social value orientation	(SVO 2)
7.	Surprise restart social dilemma game (12 rounds)	(sSDG)
8.	Post-experiment questionnaire	

In part 1 (SWB 1) all participants had to answer a self-assessment question to measure their initial subjective well-being and in part 2 (SVO 1) they had to make money allocation decisions to measure their social value orientation. In part 3 (DAM) they interacted in 18 rounds of the DAM and in part 4 (SDG) in six rounds of the SDG. In parts 5 and 6 (SWB 2 and SVO 2, respectively) participants had again to self-assess their subjective well-being and make money allocation decisions to measure post interaction social value orientation. Part 7 (sSDG) consisted of a ‘surprise’ restart of the SDG, lasting for 12 rounds. In part 8, participants answered questions about their individual characteristics.

Parts 1 and 2: SWB 1 and SVO 1. In SWB 1 we recorded participants’ response to the subjective well-being question shown in Figure 1. These initial measurement provides the baseline to which the second measurement will be compared. Subjects were asked to mark the number related to the expression of the manikin that best corresponded to how they felt at that moment.⁸ In the figure, “1” corresponds to the highest level and “9” to the lowest level of subjective well-being.

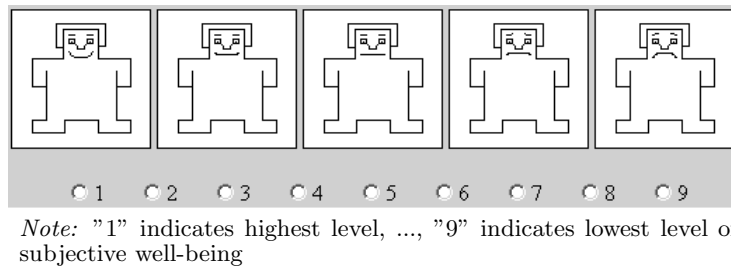
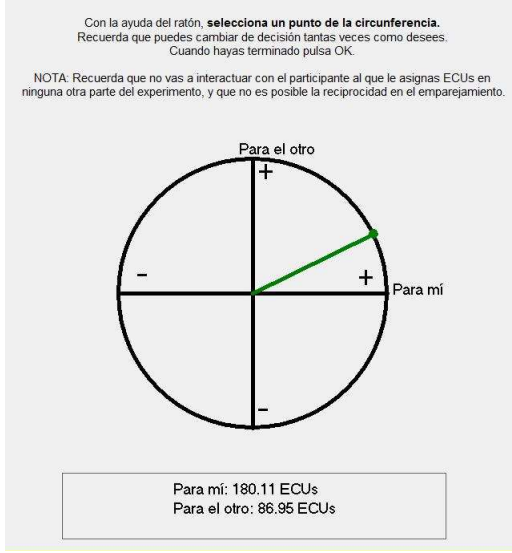


Figure 1. Subjective well-being self-assessment

⁸These figures, developed by Lang (1980), are based on Sonnemans (1991).

In SVO 1 we recorded participants' social value orientation using the so-called circle-test. The circle-test is a modified and incentivized version of the ring-test (Liebrand, 1984) and was successfully applied by, among others, Sonnemans et al. (2006) and Brandts et al. (2009). It is a simple task which allows for a quantification of individuals' social value orientation by determining the readiness of individuals to help or hurt others at some cost to themselves. Figure 2 shows an example of a circle-test as used in the experiment.



Translation:

With the help of the mouse, **choose a point on the circle**. Remember that you can change the decision as many times as you want.

When you are finished press OK.

NOTE: Remember that you will not interact with the participant to whom you assign ECU in any other part of the experiment and that reciprocity between matched pairs is not possible.

For myself: 180.11 ECU

For the other: 86.95 ECU

Figure 2. Social value orientation circle test

In the circle-test a person's social value orientation is measured by a single decision which consists of the selection of a point on the circle. Each point on the circle represents an allocation S of Experimental Currency Units (ECU) to the person who makes the choice (Self) and an allocation O of ECU to another person (Other). The amounts allocated can be positive or negative, with $S^2 + O^2 = 200^2$. Note, that each point on the circle corresponds to a certain angle of the line connecting that point with the origin, which we will use as the measure of social value orientation. For instance, an angle of 0 degrees corresponds to selfishness as it allocates 200 ECU to oneself and 0 ECU to the other; an angle of 90 degrees is interpreted as altruistic as it gives 0 to oneself and 200 to the other. Generally, between 0 and 90 degrees an increasing angle is interpreted as increasing pro-sociality. A negative angle, which reduces the earnings of the other at some cost to oneself, identifies competitiveness.⁹

In the experiment the circle appeared on participants' computer screens. Participants received computerized instructions about how to make the decision and had ample opportunity to practice.¹⁰ Decisions in the circle-test had pecuniary consequences. The chosen

⁹For an extensive discussion of the concept and measurement of social value orientation, see, e.g., Van Lange (1999) and Murphy et al. (2011).

¹⁰Each participant made a social value orientation decision with respect to another anonymously and randomly chosen participant in the lab. Importantly, the alter-participant does not make a decision towards the ego-participant but toward yet another randomly chosen participant. This was known to the participants and excludes (anticipated) reciprocity considerations.

ECU translated into money earnings at the exchange rate of 100 ECU to €1. As matched others were random and anonymous, SVO 1 measures the social value orientation towards generalized others. Subjects were not informed about the decision of ‘their’ others in the circle-test until the very end of the session.

Parts 3 and 4: DAM and SDG. Our main interest lies in potential effects of market experience on the efficiency of cooperation. In order to avoid distraction between the two parts, participants received the instructions for DAM and SDG together. After having read the instructions and before the start of DAM participants had to answer comprehension questions about both DAM and SDG.

In each of the two market treatments participants interacted in the DAM for 18 rounds and in each round there were the same three sellers and five buyers. Each seller was endowed with two units of a good which could be sold to the buyers and each buyer could buy up to two units. Thus, total market supply was six units and total market demand ten units, implying that buyers were on the long side of the market. We chose to give every trader two units (instead of only one) to create a thicker market with more trades without having to increase the number of traders. The production costs of each unit of the three sellers was 10 and the redemption value of each unit of the five buyers was 100. This gives a so-called box design with perfectly inelastic supply and demand (Holt et al., 1986). We chose that design because it creates distinct market experiences for agents on respectively the short and the long side of the market. Moreover, as traders on each side have identical market positions their behavior can be cleanly compared.

The earnings from the sale of a unit were equal to the price at which the unit was traded, while the earnings from the purchase of a unit were equal to 100 minus the price at which the unit was traded. Not traded units created neither gains nor losses. The price was allowed to have any integer value between 10 and 95 (inclusive). We chose this upper bound on the trading price to break indifference and facilitate trade.¹¹ More formally, in each round the earnings of a buyer in the market were given by

$$u = \begin{cases} (100 - p_x) + (100 - p_y) & \text{if the buyer buys one unit at price } p_x \\ & \text{and another unit at price } p_y \\ (100 - p_z) & \text{if the buyer buys one unit at price } p_z \\ 0 & \text{if the buyer does not buy any unit,} \end{cases}$$

¹¹In the experimental literature sometimes trading bonuses are used instead. We did not do that because it changes the competitive equilibrium prediction (see, e.g., Davis and Holt, 1993; Noussair and Tucker, 2013).

and the profit of a seller is given by

$$\pi = \begin{cases} (p_x - 10) + (p_y - 10) & \text{if the seller sells one unit at price } p_x \\ & \text{and another unit at price } p_y \\ (p_z - 10) & \text{if the seller sells one unit at price } p_z \\ 0 & \text{if the seller does not sell any unit,} \end{cases}$$

where $p_x, p_y, p_z \in \{10, 11, \dots, 94, 95\}$.

The markets were anonymous and, depending on the market role, a trader knew her own production cost or redemption value, but did not know those of the other traders. Hence, traders did not receive information about the earnings of the other market participants. Participants were informed about the total number of buyers and sellers active in the market. We chose this information regime because it has been shown to minimize fairness considerations and to facilitate converge to the competitive equilibrium (Smith, 1976; Holt et al., 1986). In the competitive equilibrium all six units are traded at price 95. Sellers' per unit equilibrium profit is 85 ($95 - 10$) and buyers' per unit equilibrium earnings are 5 ($100 - 95$).

In the DAM traders had to follow particular trading rules equivalent to those used in previous double-auction market experiments:

1. Buyers make purchase offers and sellers make sale offers. A purchase offer consists of a price at which to buy a unit. A sale offer consists of a price at which to sell a unit.
2. Only the highest purchase offer and the lowest sale offer are the so-called pending prices at which transactions can take place.
3. A transaction takes place automatically if the price of a purchase (sale) offer that is made is equal or higher (lower) than the price of the pending sale (purchase) offer. The transaction price is always the pending price, regardless of the offer that leads to the transaction. A transaction also takes place if a pending purchase (sale) offer is accepted by a seller (buyer).
4. New price offers have to be improvements. That is, a new purchase (sale) offer has to be higher (lower) than the pending purchase (sale) offer.
5. If a transaction takes place the market clears and any purchase offer or sale offer in the feasible price interval is possible again.
6. The units of the good are traded one by one. That is, traders cannot make offers for or trade several units at a time.

The DAM was conducted for 18 consecutive periods with the same fixed group of eight participants. Participants in a market did not know who they were matched with. A trading period ended after three minutes or when no trades were possible any more. All participants

were informed about their role in the market, buyer or seller, at the beginning of the 18 periods of the DAM and were also told that these roles would stay constant throughout these periods. During the DAM buyers and sellers could see the purchase and sale offers and transaction prices but not the identities behind the offers and transactions. Hence, traders could not track others' individual behaviors across market periods. When a trade took place, traders received information only about their own earnings. At the end of a trading period each trader received information about his or her total earnings in that period.

Immediately, after the 18 periods of the DAM, participants played six periods of the SDG. The SDG was a two-person linear public goods game and pairs stayed the same throughout the game. In each period each participant was endowed with 50 ECU and had to distribute them between a private and a public account. We used an MPCR = 0.9 so that for every unit that a player put into the public account both players in the pair obtained 0.9 units.¹² Formally, in each period of the SDG, earnings of a participant i were given by

$$w_i = 50 - g_i + 0.9(g_1 + g_2),$$

with g_i ($i = 1, 2$) being player i 's amount allocated to the public account. In the SDG, contribution decisions were made simultaneously. After each participant had made his/her decision each pair received information about decisions in their pair; that is, own contribution, other's contribution, own earnings, and other's earnings.

As already mentioned above, the matching in the SDG differed between the two market treatments, called *Market-Partners* and *Market-Strangers*. In the Market-Partners treatment each participant was matched with one of the other seven participants from the *same* DAM. Matching was done such that it led to two pairs of buyers, one pair of sellers and one pair consisting of a buyer and a seller. Specifically, the instructions specified: "You will be matched with another buyer (seller) with whom you have interacted in the market." Hence, in the SDG, participants knew the market role of the other participant they have been paired with. They were also told that they would stay matched with the same person during the six periods of the SDG. In this way we created one pair of prospective market-losers (buyer pairs), two pairs of prospective market-winners (seller pairs) and one pair consisting of a prospective market-loser and market-winner (mixed pairs).

In the Market-Strangers treatment each participant in a DAM was matched with one other participant from *another* DAM. Here the instructions specified: "You will be matched

¹²We used a two-person version of the public goods game because it allowed us to obtain a relatively large number of independent observations at relatively low costs. We chose the MPCR on the basis of two pilot sessions with stand-alone two-person linear public goods game experiments with the same subject pool as in the reported experiments. In these sessions we observed that an MPCR = 0.9 lead to efficiency levels of about 50 percent, leaving about the same room for efficiency improvement and worsening, respectively, in the market experiments.

with another buyer (seller) from another market with whom you have not interacted in the market.” In this case the matchings for the SDG were made using participants from two different DAMs. The sixteen subjects were matched in a way that led to four buyer-pairs, two seller-pairs, and two mixed pairs. Like in Market-Partners, market roles were known and the described matchings stayed the same for all periods of the SDG and participants were informed about this. Figure 3 provides a graphical representation of the matchings in Market-Partners and Market-Strangers, respectively.

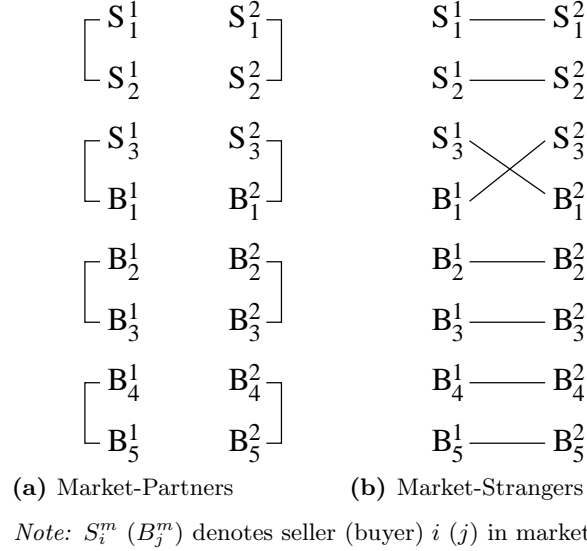


Figure 3. Matchings in the SDG in Market-Partners and Market-Strangers

Parts 5 and 6: SWB 2 and SVO 2. After the SDG, in SWB 2 we again recorded participants’ response to the subjective well-being question shown in Figure 1 and in SVO 2 participants again made decisions in the social value orientation circle-test.¹³ In SVO 2 each participant made an allocation decision with respect to him/herself and another anonymously and randomly chosen participant whom s/he did not interact with in any of the previous parts. As in SVO 1, to avoid (anticipated) reciprocity, the matched participant did not make a decision towards the deciding participant but towards another not previously matched participant. Subjects were informed about this but did not receive information about the decision of ‘their’ paired others until the very end of the session.

Part 7: sSDG. After SVO 2 a surprise restart of the SDG was announced and participants played an additional 12 periods of the SDG. Each participant was informed that they would be matched with the same person as in the first six periods. We introduced the surprise restart to distinguish between short-run and long-run effects. This way we can see if any

¹³Alternatively, we could have placed SWB 2 and SVO 2 directly after the DAM. We did not do that because it could have influenced behavior in the the SDG, which is our main variable of interest.

effects on the efficiency of cooperation due to market experience would be longer lasting and survive the re-setting commonly observed in public goods games with surprise restarts (see, e.g., Andreoni, 1988; Croson, 1996). In our view, long-run effects are particularly interesting.

3.2 Non-market Treatments

As a benchmark to which to compare contribution behavior in the social dilemma game after the market interaction, we ran treatments where participants played a SDG without having experienced market interaction before. In these treatments, except for the absence of a DAM, the sequence of events was exactly the same as depicted in Table 1. Like in the market treatments, each participant was matched with the same other person both in the first six and the second 12 periods of the SDG. We call these treatments OSDG (standing for ‘Only’ SDG). We have a treatment that is completely parallel to Market-Partners, which we will refer to as OSDG-MP, and one parallel to Market-Strangers, denoted by OSDG-MS.

A crucial feature of the OSDG treatments is that participants received initial lump-sum payments of money, which corresponded to the average earnings of participants in different conditions of the market treatments. As we will see in the results part, there are large earnings differences between sellers and buyers in the DAM. The initial lump-sum payments participants received were meant to control for potential effects of these differences on contribution behavior in the SDG. Our use of a lab experiment makes it possible to control for income differences in this way and, hence, to isolate the pure effects of market participation.

In each OSDG treatment, each participant was in one of two payment conditions. The conditions differed with respect to the received lump-sum payment, which corresponded respectively to the average buyer and seller earnings in Market-Partners and Market-Strangers. The instructions for the SDG in these benchmark treatments were kept as close as possible to those in the DAM. Regarding the lump-sum payments and the matching with another participant in the OSDG the instructions said: “You have been assigned initial earnings of X ECU. The other group member is also assigned some initial earnings. The assignments to you and the other group member are not necessarily the same. You and the other group member will receive this amount independently of what occurs during the experiment.”¹⁴ We deliberately used a vague phrasing regarding the earnings of the other group member because in the DAM participants also only knew their own market earnings for sure, whereas they did not receive information about the other group member’s market earnings.¹⁵ We describe the exact lump-sum earnings and corresponding matchings in the OSDG treatments after we

¹⁴The actual amount of ECU used in the instructions depended on the condition the participant was assigned to (see Section 6.1 below).

¹⁵In order to check whether full transparency regarding the lump-sum income changes contributions in the SDG, we have conducted an additional treatment that exactly matches the OSDG-MP but reveals the information about lump-sum incomes to both participants in a pair.

have discussed behavior in markets and thus know earnings from market interaction for all types of traders (see end of Section 6.1).

4 Experiment Procedures

In total 448 subjects participated in the main treatments of our experiment.¹⁶ We ran three sessions with the Market-Partners treatment, four with the Market-Strangers treatment and three with the OSDG treatments. We have data from 112 subjects in Market-Partners in 14 separate markets, 192 subjects in Market-Strangers in 24 separate markets, thus 12 interlinked markets, and 144 subjects in OSDG in 72 separate pairs. For Market-Partners we have 56 pairs in the SDG (28 buyer-pairs, 14 seller-pairs, 14 mixed-pairs) organized in 14 independent matching groups (markets) and for Market-Strangers we have 96 pairs in the SDG (48 buyer pairs, 24 seller pairs, 24 mixed pairs) organized in 12 independent matching groups (interlinked markets across which participants are matched in the subsequent SDG). In OSDG the 72 statistically independent observations (i.e., matched pairs of participants in the SDG) are distributed over six different lump-sum payment conditions with 12 independent pairs per condition. These lump-sum payment conditions mirror the buyer pairs, seller pairs, and mixed pairs in the Market-Partners and Market-Strangers treatment, respectively (see Section 6.2 for details). Table 2 provides an overview of the treatments, number of subjects, number of pairs in the SDG and number of independent observations in each treatment and pair, respectively.

Table 2. Summary of market treatments and main non-market treatments

Market-Partners $N = 112$ $n = 14$			Market-Strangers $N = 192$ $n = 12$		
buyer pairs $N_{bp} = 28$ $n_{bp} = 14$	seller pairs $N_{sp} = 14$ $n_{sp} = 14$	mixed pairs $N_{mp} = 14$ $n_{mp} = 14$	buyer pairs $N_{bp} = 48$ $n_{bp} = 12$	seller pairs $N_{sp} = 24$ $n_{sp} = 12$	mixed pairs $N_{mp} = 24$ $n_{mp} = 12$
OSDG-MP $N = 72$ $n = 36$			OSDG-MS $N = 72$ $n = 36$		
‘buyer pairs’ $N_{bp} = 12$ $n_{bp} = 12$	‘seller pairs’ $N_{sp} = 12$ $n_{sp} = 12$	‘mixed pairs’ $N_{mp} = 12$ $n_{mp} = 12$	‘buyer pairs’ $N_{bp} = 12$ $n_{bp} = 12$	‘seller pairs’ $N_{sp} = 12$ $n_{sp} = 12$	‘mixed pairs’ $N_{mp} = 12$ $n_{mp} = 12$

Note: $N(n)$... number of subjects (independent observations) on treatment level; $N_{xp}.(n_{xp})$... number of pairs (independent observations on pair level); ‘buyer/seller/mixed pairs’ indicates lump-sum payment condition mirroring buyer/seller/mixed pairs in the Market-Partners treatment and Market-Strangers treatment, respectively.

In the two market treatments, each participant’s role (buyer or seller) was fixed for the duration of the session. General instructions were read out aloud at the start of each session.

¹⁶In addition 90 subjects participated in the non-market treatment with lump-sum income transparency.

Instructions for the different parts were given on-screen and participants could read them at their own pace.¹⁷ Participants could ask questions by raising a hand. All questions were answered in private.

The experiments were conducted at the LINEEX lab at the University of Valencia using the z-tree program of Fischbacher (2007). Each session involved one of the treatments and no one could participate in more than one session. Performance-based earnings were counted in ECU and total earnings consisted of the accumulated earnings across all parts. Each 100 ECU were worth €1. Participants did not receive a show-up fee. At the end of a session participants were privately paid out their earnings in cash. Average earnings were €33.00 for OSDG and €29.50 for the market treatments. Non-market sessions took about 90 minutes and sessions with market treatments took about 120 minutes.

5 Research Questions

Our research questions relate directly to the views of Smith (1998) and Bowles (1998) presented in the Introduction and to the distinction between state-dependent preferences and separable preferences between economic incentives and social preferences introduced by Bowles and Polania-Reyes (2012). The notion of separability is also implied in the view proposed by Smith (1998) stating that people are able to decouple behavior in small-group exchange from that in anonymous markets. In the context of our experiment, separability means that the ability to efficiently cooperate in a social dilemma game is independent of preceding market experience. Moreover, it also implies that subjective well-being as well as social value orientation are unaffected by experienced market interaction.

Alternatively, behavior can depend on the circumstances surrounding the decision situation, which can be captured by the notion of state-dependence.¹⁸ In the words of Bowles and Polania-Reyes (2012): “State-dependence arises because actions are motivated by a heterogeneous repertoire of preferences from spiteful to payoff-maximizing to generous, for example, the salience of which depends on the nature of the decision situation” (p. 373).¹⁹ Applied to our research this implies that preferences and behavior could be state-dependent in the general sense that market experience affects subsequent cooperation. Moreover, the effect

¹⁷The main reason for not reading out aloud all instructions was that this would have revealed information about the potential earnings of buyers and sellers in DAM, which we wanted to avoid.

¹⁸Bowles and Polania-Reyes (2012) distinguish between state-dependent and endogenous preferences. In their framework, the term endogenous preferences is used in relation to processes with effects that persist in the long-run, typically as the result of a process of cultural transmission. In the context of our study, the effects we focus on can be better captured in terms of state-dependence.

¹⁹An example of how state-dependence could be incorporated into a formal model of social preferences is the general model of Charness and Rabin (2002). This two-person model has a more standard part with own and other’s payoff and also incorporates a particular parameter that is said to be set to 1 when the decision-maker thinks that the counter-part is misbehaving while it is set to 0 when the counter-part is not misbehaving. The state is whether the counter-part is misbehaving or not and this gives rise to a repertoire of two different social preferences.

could be positive and increase cooperation, in accordance with the idea of *doux commerce* of Montesquieu (1748) or it could be negative, in line with the social criticism of Engels (1845), and decrease subsequent cooperation. Thus, our first research question may be summarized as follows:

Research Question 1. *Does market experience as such affect the efficiency of subsequent cooperation? In case cooperation is affected, will the effect be positive or negative?*

As advanced in the Introduction, we are not only interested in whether market interaction as such affects subsequent behavior but also in whether particular variations in the nature of the market interaction will lead to variations in the efficiency of cooperation. Our design makes it possible to make a number of specific comparisons of interest.

First, we can separately compare behavior of agents who competed with each other on the same market (Market-Partners) and behavior of agents who experienced market interaction on different markets (Market-Strangers) to the behavior in the corresponding OSDG treatments as well as compare Market-Strangers with Market-Partners as such. One may expect the different kinds of relations in the market to differentially affect participants' attitudes towards the subsequent interaction. In Market-Partners the experience of having competed with each other for scarce resources may on the one hand inject some sense of social closeness and thus increase cooperation, but on the other hand it may also induce a competitive state that could be detrimental to efficient cooperation. The Market-Strangers setting may create an atmosphere of more anonymity and disconnectedness and thereby decrease the motivation to cooperate. On the other hand, the observations of Henrich et al. (2001) and Henrich et al. (2004) discussed in the Introduction suggest that market experience with strangers may have a positive effect on cooperation. Thus, a priori, it is an open question whether market interaction leads to more or less efficient cooperation in Market-Partners and Market-Strangers, respectively. We summarize this thoughts in our next research question.

Research Question 2. *Does market experience in Market-Partners and Market-Strangers affect the efficiency of cooperation positively or negatively relative to the corresponding non-market treatments OSDG-MP and OSDG-MS? Does the efficiency of cooperation differ between Market-Partners and Market-Strangers?*

Further, continuing with the separation between Market-Partners and Market-Strangers we can disaggregate and compare behavior in different matchings of participants who have been on opposite sides or the same side of the market. In the latter case we can also compare whether the market side itself matters. These comparisons are directly related to the potentially differential effects of experiencing market interaction on respectively the long and short side of markets, as mentioned in the citation from Bowles (1998) reproduced in the

Introduction. They are of particular interest, because they touch on the important societal issue whether market experience has different repercussions for those who have it easy in the market (market-winners) compared to those who have a hard time (market-losers). These disaggregated comparisons will all be made with respect to the corresponding lump-sum payment conditions in OSDG-MP and OSDG-MS, respectively, so as to isolate the pure effect of market experience. In addition, we can also make comparisons across market treatments to explore if the experience of being on respectively the long and short side of the market has differential effects in Market-Partners and Market-Strangers. This can be summarized in the following question.

Research Question 3. *Is the efficiency of cooperation of respectively market-winners, market-losers and traders from opposite market sides affected differentially? Does the efficiency of cooperation of these different pairs of traders depend on whether market interaction took place in Market-Partners or Market-Strangers?*

Recall that traders in the experiment play two repeated SDGs. One, for six periods, immediately after the market interactions and, after a surprise restart, another one for twelve periods. With these two games we can explore whether an eventual effect of market experience on the efficiency of cooperation is observed only in the short run or also in the long run. We will therefore investigate Research Questions 1–3 separately for the first and second SDG.

Finally, Brandts et al. (2009) found that experiencing rivalry in fixed triads had a negative impact on the experienced well-being of those on the long side of the interaction and a positive impact on those on the short side. Here we study whether this result extends to the case of market interaction in a proper competitive market.²⁰

6 Results

In this section, we first briefly report on market behavior to see if our markets indeed converge to asymmetric equilibrium outcomes as intended. Thereafter, we zoom in to our main research questions and discuss if and how different market experiences affect behavior in the subsequent social dilemma games. Finally, we discuss the effect of different experiences in the markets and social dilemma games on subjective well-being and social value orientation.

6.1 Market Behavior

Figure 4 shows the average transaction price over the 18 trading periods in the two market treatments. As expected, prices in both treatments converge to the highest possible price

²⁰In the mentioned study, it was found for social value orientation that the powerful player in the triad did not change his disposition towards the player who had been chosen more frequently and thus earned relatively much but surprisingly lowered it towards the less frequently chosen and thus low earnings player. Both powerless players lowered their disposition towards others.

of 95. Of the total of 4104 possible trades only 7 were not realized and overall efficiency was with 99.8% virtually optimal. Thus, markets clear, are efficient and lead to very unequal incomes. Using individual data, the averages (standard deviations) of earnings are 2672 (277) for sellers and 340 (176) for buyers in the Market-Partners treatment and 2656 (324) for sellers and 346 (222) for buyers in the Market-Strangers treatment.²¹

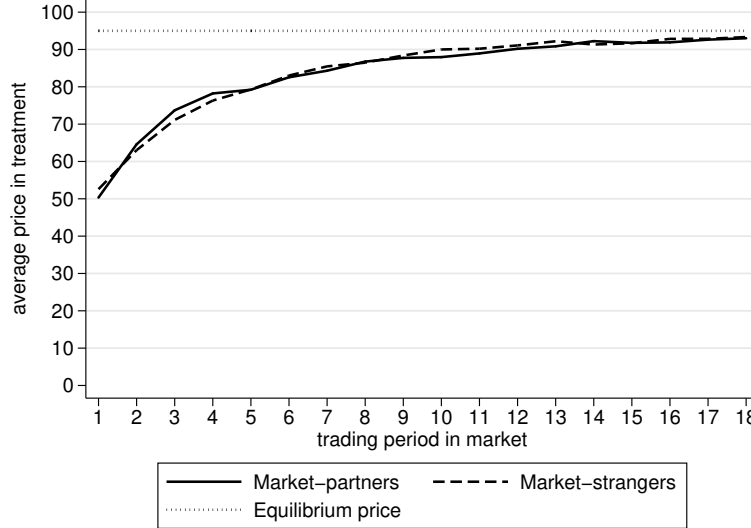


Figure 4. Average trading price dynamics in both market treatments

As expected, neither buyer nor seller earnings significantly differ between Market-Partners and Market-Strangers (buyer earnings: $p = 0.6434$, seller-earnings: $p = 0.5371$; MW-tests, 2-sided). We can conclude that our manipulation worked as intended. With the implemented markets we achieved an efficient allocation of resources with very different market experiences for participants on the long and on the short side of the market, without differences between the two market environments.

Before moving on to the discussion if and how market experience affects the efficiency of cooperation we briefly explain how the different lump-sum payment conditions in the non-market treatments OSDG-MP and OSDG-MS were created. The idea was to match lump-sum (i.e., non-market) earnings of pairs of subjects in OSDG-MP and OSDG-MS with average earnings of buyer pairs, seller pairs and mixed pairs in Market-Partners and Market-Strangers, respectively. We have just seen that in Market-Partners sellers earned on average 2672 ECU and buyers 340 ECU. In Market-Partners the corresponding earnings were 2656 ECU and 346 ECU. To control for these income differences, in OSDG-MP and OSDG-MS we assigned participants to the following lump-sum earnings pairs: 340-340, 2672-2672, and 2672-340, respectively, to mimic buyer-buyer, seller-seller, and seller-buyer matchings in Market-Partners and 346-346, 2656-2656, 2656-346 to mimic the equivalent matchings in Market-Strangers.

²¹Note that if there are any pre-existing social preferences they apparently have little effect on the outcome of the market interaction, due to the competitiveness of the institution (see Bolton and Ockenfels, 2000).

6.2 Efficiency of Cooperation after Market Interaction

In our presentation of results we respond one by one to the research questions posed in Section 5. We start with Research Questions 1 and 2 where we look at potential effects of market experience *per se* in Market-Partners and Market-Strangers, respectively, and do not distinguish between different trader and lump-sum payment types. Table 3 shows descriptive statistics (medians, means, and standard deviations) for the efficiency of cooperation in the social dilemma game in Market-Partners, Market-Strangers, OSDG-MP, and OSDG-MS, respectively, as well as relevant Mann-Whitney rank-sum tests of differences between treatments.²² As explained above we also distinguish between the short-run and the long-run.

Focusing first on the Market-Partners treatment we see that contributions in Market-Partners are significantly lower than in the corresponding OSDG-MP. This holds for the short run ($p = 0.0456$) as well as the long run ($p = 0.0299$).²³ Note that the average difference in the short run amounts to about 15.6 percent of the endowment (7.8 out of 50) and increases to about 21.2 percent of the endowment (10.6 out of 50) in the long run. The negative effect of market experience is thus also economically substantial. In contrast, there is no such negative effect in the Market-Strangers treatment. If anything, contributions tend to be higher in Market-Strangers than in OSDG-MS. The differences are however statistically not significant, neither in the short run ($p = 0.5203$) nor in the long run ($p = 0.3656$). Finally, a comparison of Market-Partners with Market-Strangers shows that the efficiency of cooperation is substantially and significantly lower in the former than in the latter. Again this holds for the short and long run ($p = 0.0040$ and $p = 0.0020$). For completeness we also note that there is no difference in contributions between the OSDG-MP treatment and the OSDG-MS treatment ($p = 0.3735$ in the short run; $p = 0.5618$ in the long run), indicating that the slightly different initial lump-sum payments participants receive do not affect behavior. The latter also indicates that the differential effects of Market-Partners and Market-Strangers are not due to differences in the non-market treatments.

Regression analysis controlling for time trends corroborates the reported non-parametric test results. Table 4 shows the results of Tobit regressions for the short run and the long run where we control for time effects by using period dummies.²⁴ The baseline category is the OSDG-MP treatment. For the short as well as the long run, the coefficient estimates for Market-Partners show directly that contributions are significantly smaller than in OSDG-MP ($p < 0.01$). Further, the results of F -tests comparing regression coefficients reported at the bottom of the table show that there is no significant difference between Market-

²²Throughout the paper we measure the efficiency of cooperation with the contributions to the public good.

²³Unless indicated otherwise, all reported tests are two-sided Mann-Whitney rank-sum tests based on strictly independent observations.

²⁴To save on space we do not show the coefficients of the period dummies. The full regression table can be found in Appendix A, Table A.1.

Table 3. Efficiency of cooperation in market and no-market treatments (across trader matchings)

Treatment	N	Short run			Long run		
		median	mean	st. dev.	median	mean	st. dev.
Market-Partners	14	23.740	23.025	7.556	26.120	22.172	7.502
OSDG-MP	36	33.167	30.801	13.814	41.104	32.766	15.659
Market-Strangers	12	32.146	31.418	3.154	31.357	30.422	3.612
OSDG-MS	36	27.500	28.468	12.197	34.708	31.669	14.551
MP vs OSDG-MP		$p = 0.0456$			$p = 0.0299$		
MS vs OSDG-MS		$p = 0.5203$			$p = 0.3656$		
MP vs MS		$p = 0.0040$			$p = 0.0020$		
OSDG-MP vs OSDG-MS		$p = 0.3735$			$p = 0.5618$		

Note: all statistics are based on strictly independent observations; p -values based on Mann-Whitney rank sum tests, two-sided; MP (MS) stands for Market-Partners (Market-Strangers).

Strangers and the corresponding OSDG-MS in the short or the long run ($p = 0.172$ and $p = 0.523$). The tests comparing Market-Partners and Market-Strangers show that the contributions are significantly lower in the former than in the latter ($p < 0.001$ for both short and long-run).

Hence, we find that market participation can be harmful for cooperation but find also that it is not harmful *per se* and that this pattern holds in the short run as well as the long run. We summarize the above discussion in our first result.

Result 1. *(i) Market experience strongly harms the efficiency of cooperation when traders have to solve the social dilemma with other traders they had previously interacted with in the same market. (ii) Market experience does not have a detrimental effect on the efficiency of cooperation when traders have to solve the social dilemma with other traders they did not interact on the market before. (iii) This holds in the short and in the long run and the negative effect tends to get larger in the long run.*

We next move to the question, whether the aggregate differences just discussed are similar for the different trader matchings or whether they are driven by specific matchings. Recall that in buyer pairs the interacting participants both have had a difficult time in securing trades while in seller pairs participants have competed for trades from a relatively comfortable position. Finally, mixed pairs bring together very different market experiences. Table 5 reports descriptive statistics of contributions and corresponding tests for the three types of trader matchings, buyer-buyer, seller-seller and buyer-seller, in Market-Partners and Market-Strangers, respectively. The corresponding income matchings in OSDG-MP and OSDG-MS for convenience are called low-pay (340-340 and 346-346), high-pay (2672-2672 and 2656-2656), and mixed-pay (340-2672 and 346-2656).²⁵

²⁵Table A.8 in Appendix A compares contributions to the social dilemma game in OSDG-MP and the OSDG-MP treatment with lump-sum income transparency for all pairings and in short and long run. The results

Table 4. Differences in contributions in the social dilemma game across market and non-market treatments

	Short run	Long run
OSDG-MP (const.)	41.529*** (4.013)	45.804*** (5.975)
Market-Partners	-12.341** (5.023)	-21.892*** (6.801)
OSDG-MS	-4.590 (5.110)	-3.628 (7.518)
Market-Strangers	0.255 (4.258)	-6.923 (6.199)
Period dummies	Yes	Yes
N	2688	5376
F	24.201	9.891
Prob > F	0.000	0.000
<i>Market-Strangers vs OSDG-MS</i>		
F -statistics	1.870	0.407
p -value	0.172	0.523
<i>Market-Partners vs Market-Strangers</i>		
F -statistics	13.617	13.528
p -value	0.000	0.000

Notes: Tobit regressions with lower limit of 0 and upper limit of 50; standard errors in parentheses, adjusted for 98 clusters; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Focusing on buyer-buyer pairs first we see that the pattern of contributions is the same as for the aggregate data shown in Table 3 above. Specifically, buyer pairs contribute less in Market-Partners than low-pay pairs in OSDG-MP, in the short run ($p = 0.0040$) as well as in the long run ($p = 0.0136$). Again the difference in average contributions between Market-Partners and OSDG-MP is economically substantial amounting to 25 and 28.6 percent of the endowment in the short run and in the long run, respectively. Also similar to the aggregate data no such differences are found when comparing Market-Strangers with OSDG-MS ($p \geq 0.1659$). Together this implies that buyer pairs in Market-Partners achieve significantly lower cooperation efficiency than buyer pairs in Market-Strangers, again in the short run ($p = 0.0308$) as well as the long run ($p = 0.0270$).

For seller pairs in the Market-Partners treatment the contributions pattern is similar to the one observed for buyer pairs but appears to be somewhat less pronounced. Seller

show that contributions are all similar and none of the comparisons is statistically significant (p -values vary between 0.2609 and 0.9610).

Table 5. Efficiency of cooperation in market treatments and non-market treatments for the different trader matchings

Buyer-buyer pairs							
Treatment	N	Short run			Long run		
		median	mean	st. dev.	median	mean	st. dev.
Market-Partners	14	22.042	21.729	8.751	15.000	18.682	11.849
OSDG-MP (low-pay)	12	33.542	34.243	9.633	41.104	33.038	15.326
Market-Strangers	12	30.229	29.236	5.854	28.729	27.990	6.707
OSDG-MS (low-pay)	12	33.125	32.597	9.083	35.875	33.674	13.375
MP vs OSDG-MP		$p = 0.0040$			$p = 0.0136$		
MS vs OSDG-MS		$p = 0.2987$			$p = 0.1659$		
MP vs MS		$p = 0.0308$			$p = 0.0270$		
OSDG-MP vs OSDG-MS		$p = 0.6648$			$p = 0.9310$		
Seller-seller pairs							
Treatment	N	Short run			Long run		
		median	mean	st. dev.	median	mean	st. dev.
Market-Partners	14	18.250	21.768	12.413	21.042	20.699	14.385
OSDG-MP (high-pay)	12	26.500	29.097	15.536	38.521	34.222	15.634
Market-Strangers	12	34.396	35.486	7.428	34.573	35.168	7.323
OSDG-MS (high-pay)	12	23.833	23.785	11.064	33.917	31.649	14.522
MP vs OSDG-MP		$p = 0.1811$			$p = 0.0349$		
MS vs OSDG-MS		$p = 0.0130$			$p = 0.6649$		
MP vs MS		$p = 0.0075$			$p = 0.0075$		
OSDG-MP vs OSDG-MS		$p = 0.2985$			$p = 0.3262$		
Buyer-seller pairs							
Treatment	N	Short run			Long run		
		median	mean	st. dev.	median	mean	st. dev.
Market-Partners	14	27.125	26.875	15.507	34.167	30.625	16.213
OSDG-MP (mixed-pay)	12	32.875	29.063	15.926	35.604	31.038	17.182
Market-Strangers	12	29.271	31.715	7.368	28.563	30.540	9.051
OSDG-MS (mixed-pay)	12	33.542	29.021	15.019	33.500	29.684	16.590
MP vs OSDG-MP		$p = 0.7187$			$p = 0.9590$		
MS vs OSDG-MS		$p = 0.9770$			$p = 0.8174$		
MP vs MS		$p = 0.7576$			$p = 0.6619$		
OSDG-MP vs OSDG-MS		$p = 0.8852$			$p = 0.6861$		

Note: all statistics are based on strictly independent observations; p -values based on Mann-Whitney rank sum tests, two-sided; MP (MS) stands for Market-Partners (Market-Strangers); in OSDG-MP and OSDG-MS ‘low-pay’ corresponds to income matchings 340-340 and 346-346, respectively, ‘high-pay’ to income matchings 2672-2672 and 2656-2656, respectively, and ‘mixed-pay’ to income matchings 340-2672 and 346-2656, respectively.

pairs contribute less in Market-Partners than high-pay pairs in OSDG-MP in the short run as well as the long run, but the difference is statistically significant only in the latter case ($p = 0.1811$ and $p = 0.0349$). Looking at the Market-Strangers treatment we see that seller pairs contribute *more* than high-pay pairs in OSDG-MS. Now the difference is significant in

the short run ($p = 0.0130$) but not in the long run (0.6649). To understand these patterns it is helpful to have a closer look at the non-market treatments. In these treatments, in the short run contributions of high-pay pairs appear to be lower than contributions of low-pay pairs. Indeed, pair-wise comparisons show that in OSDG-MS high-pay pairs contribute marginally significantly less than low-pay pairs ($p = 0.0647$). In OSDG-MP, however, the difference between high- and low-pay pairs is statistically not significant ($p = 0.4882$). In the long run, there is no significant difference between high-pay and low-pay pairs in either non-market treatment ($p \geq 0.6439$).²⁶ This suggests that there is some (weak) negative effect on contributions of high lump-sum payments in the short run, which contributes to both the non-significance in the Market-Partners vs OSDG-MP comparison and the significance in the Market-Strangers vs OSDG-MS comparison. However, the high-pay effect is only transitory and vanishes in the long run whereas the market experience effect appears to be stable. Finally, when comparing the two market treatments with each other we observe that the efficiency in Market-Partners is significantly and substantially lower than in Market-Strangers ($p = 0.0075$ in the short and long run). Together this suggests that for seller pairs there is a negative effect of experienced market interaction, when this interaction is in Market-Partners.

For mixed buyer-seller pairs there are no significant differences detected when comparing Market-Partners with OSDG-MP, in the short run ($p = 0.7187$) as well as the long run ($p = 0.9590$), Market-Strangers with OSDG-MS (short run: $p = 0.9770$; long run: $p = 0.8174$), and Market-Partners with Market-Strangers (short run: $p = 0.7576$; long run: $p = 0.6619$). Thus, the efficiency of cooperation of traders who have been on opposite sides of the market is not hampered by market experience, irrespective of having interacted on the same or different markets.

All reported non-parametric test results are corroborated by Tobit regression analyses where we control for period effects with period dummies. Table 6 reports these regression results.²⁷ We summarize the above discussion in our next result.

Result 2. *(i) The observed overall adverse effects of market experience on the efficiency of cooperation in Market-Partners can be attributed to both market losers (buyer pairs) and, albeit to a lesser extent, market winners (seller pairs). (ii) The efficiency of cooperation in Market-Strangers is unaffected for market losers and tends to be enhanced for market winners, in the short run. The latter is mainly due to a negative short run income effect. (iii) The efficiency of cooperation in trader pairs composed of market winners and market losers is unaffected by previous market interaction.*

²⁶For completeness, we note that in both non-market treatments (short-run and long-run) there are no significant differences in contributions between mixed-pay pairs and, respectively, low-pay pairs and high-pay pairs ($p \geq 0.4024$).

²⁷Tables A.2–A.4 in Appendix A report the regressions with coefficients for the period dummies.

Table 6. Differences in contributions in the social dilemma game across market and non-market treatments

	Buyer-buyer pairs		Seller-seller pairs		Buyer-seller pairs	
	Short run	Long run	Short run	Long run	Short run	Long run
OSDG-MP (const.)	46.737*** (5.219)	48.170*** (9.292)	37.035*** (7.530)	43.503*** (10.033)	39.734*** (8.024)	43.432*** (12.072)
Market-Partners	-18.814*** (6.134)	-27.229** (10.625)	-11.966 (9.092)	-25.981** (11.931)	-1.942 (11.186)	-2.735 (15.835)
OSDG-MS	-3.944 (6.355)	-2.011 (11.586)	-8.932 (8.849)	-5.831 (11.949)	-0.430 (11.424)	-2.292 (16.301)
Market-Strangers	-8.380 (5.705)	-11.916 (9.838)	8.630 (8.406)	-0.476 (10.307)	6.377 (9.080)	-1.824 (13.836)
Period dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	1200	2400	744	1488	744	1488
F	10.577	5.040	7.731	3.254	6.335	2.702
Prob > F	0.000	0.000	0.000	0.000	0.000	0.001
<i>Market-Strangers vs OSDG-MS</i>						
F -statistics	0.929	1.553	8.916	0.419	0.542	0.001
p -value	0.335	0.213	0.003	0.518	0.462	0.970
<i>Market-Strangers vs Market-Partners</i>						
F -statistics	6.129	5.765	11.022	9.885	0.872	0.006
p -value	0.013	0.016	0.001	0.002	0.351	0.940

Notes: Tobit regressions with lower limit of 0 and upper limit of 50; standard errors in parentheses, adjusted for 50 clusters; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The result that market experience has no effect whatsoever on traders who have been on opposite sides of markets (buyer-seller pairs) raises the question whether this is due to that both traders' contributions are unaffected or that one trader type contributes more while the other trader type contributes less. To test for this we looked at contributions of both types separately in the short run and the long run. In addition, as short run and long run levels may be affected by the dynamics of interaction, we also looked at contributions in the very first period of the first social dilemma game. Table 7 reports the results, which show that there is virtually no difference in contributions between buyers and sellers neither in the short nor in long run. Also in period 1 the differences are small and statistically insignificant ($p = 1.000$ in Market-Partners and $p = 0.4546$ in Market-Strangers). From that we conclude that market experience does not affect the efficiency of cooperation in groups consisting of a market winner and a market loser.

Up to now we have compared behavior between market treatments and non-market treatments as well as between the two market treatments. We now move on to the question whether the efficiency of cooperation differs between market-winners, market-losers and mixed pairs *within* the market treatments. Table 8 provides an overview of the results. In the Market-

Table 7. Contributions of buyers and sellers within buyer-seller matchings in market treatments

Treatment & role	Period 1		Short run		Long run	
	mean	st. dev.	mean	st. dev.	mean	st. dev.
Market-Partners						
Seller	32.500	18.989	27.357	17.176	31.155	15.758
Buyer	33.286	15.529	26.393	14.135	30.095	17.076
Market-Strangers						
Seller	34.917	14.163	30.757	8.582	29.615	9.282
Buyer	37.292	15.250	32.674	7.329	31.465	9.580

Note: ‘Period 1’ statistics are based on individual observations ($N = 14$ in Market-Partners, $N = 24$ in Market-Strangers); ‘Short run’ and ‘Long run’ statistics are based on strictly independent observations ($N = 14$ in Market-Partners, $N = 12$ in Market-Strangers).

Partners treatment there are no differences across trader pairs in the short run ($p = 0.6404$, Kruskal-Wallis test, two-sided). In the long run, there is no difference in contributions between buyer pairs and seller pairs ($p = 0.3878$, Dunn’s test, two-sided), but both these trader matchings tend to contribute less than mixed pairs ($p = 0.0678$ and $p = 0.0644$, Dunn’s test, two-sided).²⁸ In the Market-Strangers treatment, Kruskal-Wallis tests indicate (close to) marginally significant differences across trader matchings in the short run and in the long run ($p = 0.1089$ and $p = 0.0942$, two-sided). Pair-wise comparisons show that this is driven by seller pairs who in the short run contribute marginally significantly more than buyer pairs ($p = 0.0572$, Dunn’s test, two-sided) and in the long run more than both buyer pairs and mixed pairs ($p = 0.0533$ and $p = 0.0944$, Dunn’s test, two-sided). All other comparisons do not return statistically significant results (see Table 7 for details). We summarize the discussed findings in our next result.

Result 3. *With a joint market experience (Market-Partners) market-loser pairs and market-winner pairs contribute similarly and both tend to contribute less than mixed pairs. In pairs without a joint market experience (Market-Strangers) pairs of market-winners tend to contribute more than pairs consisting of market-losers or mixed pairs.*

Result 3 documents that traders who have competed on the same market (Market-Partners) and on the same side of the market—either on the favorable side or on the unfavorable one—achieve less efficient cooperation outcomes than pairs of traders who also have been in the same market but on opposite sides of it. By contrast, for Market-Strangers having been on the favorable side of the market causes higher subsequent cooperation levels than having been on the unfavorable side. Thus, there seems to be a market-winner cooperation rent, which can however only be ‘cashed in’ when the cooperation problem occurs with others who have not been in the same market.

²⁸The p -values of pair-wise tests are corrected for multiple comparisons using the false discovery rate correction introduced by Benjamini and Hochberg (1995).

Table 8. Comparison of efficiency of cooperation of different trader pairs within each market treatment

Market-Partners							
Trader pair	N	Short run			Long run		
		median	mean	st. dev.	median	mean	st. dev.
Buyer-buyer	14	22.042	21.729	8.751	15.000	18.682	11.849
Seller-seller	14	18.250	21.768	12.413	21.042	20.699	14.385
Buyer-seller	14	27.125	26.875	15.507	34.167	30.625	16.213
Across all trader matchings ^a		$p = 0.6404$			$p = 0.0956$		
Buyer-buyer vs Seller-seller		$p = 0.4449$			$p = 0.3878$		
Buyer-buyer vs Buyer-seller		$p = 0.3447$			$p = 0.0678$		
Seller-Seller vs Buyer-seller		$p = 0.5698$			$p = 0.0644$		
Market-Strangers							
Trader pair	N	median	mean	st. dev.	median	mean	st. dev.
Buyer-buyer	12	30.229	29.236	5.854	28.729	27.990	6.707
Seller-seller	12	34.396	35.486	7.428	34.573	35.168	7.323
Buyer-seller	12	29.271	31.715	7.368	28.563	30.540	9.051
Across all trader matchings ^a		$p = 0.1089$			$p = 0.0942$		
Buyer-buyer vs Seller-seller		$p = 0.0572$			$p = 0.0533$		
Buyer-buyer vs Buyer-seller		$p = 0.2367$			$p = 0.2838$		
Seller-Seller vs Buyer-seller		$p = 0.1313$			$p = 0.0944$		

Note: all statistics are based on strictly independent observations; ^a Kruskal-Wallis test; for pair-wise comparisons p -values are based on Dunn’s tests (Dunn, 1964) with false discovery rate correction for multiple comparisons (Benjamini and Hochberg, 1995).

6.3 Subjective Well-being and Social Value Orientation

Recall that we asked participants to respond to our subjective well-being and social value orientation questions at two points during the experiment: in Part 1, at the very beginning of the experiment, and in Part 5, after the market interaction (in the market treatments) and the six rounds of the first SDG had taken place.

Table 9 shows the results of our regression analysis for the case of Market-Partners and OSDG-MP with the change in subjective well-being and social value orientation as dependent variables, where to control for inter-individual variability we focus on the change in these measures from the first to second measurement point.²⁹ The independent variables are a dummy variable for OSDG-MP (with Market-Partners being the reference category), a dummy variable capturing whether the participant was either a buyer in market partners or received a low lump-sum income in OSDG-MP (‘Buyer or Low-pay’) and an interaction variable between the last two variables, which shows the effect of being a low-pay subject in OSDG-MP relative to being a buyer in Market-Partners. In addition, since the second measurement of subjective well-being and social value orientation was taken after the six periods of the first SDG, we control for individual earnings in this first SDG (‘SDG 1 earnings’). For subjective well-being the regression results show no significant difference between Market-Partners and OSDG-MP. However, the coefficients of the other two variables reveal

²⁹Descriptive statistics for the initial values, final values and change values of both subjective well-being and social value orientation can be found in Tables A.5–A.7 of Appendix A.

a significant negative effect of having been a buyer in the Market-Partnerstreatment and no effect of having received low income in the OSDG-MP ($p = 0.606$ for low-pay in OSDG-MP). The regression for social value orientation shows no significant effects at all.

Table 9. Change in subjective well-being & social value orientation in Market-Partners and OSDG-MP

	Subjective well-being	Social value orientation
Market-Partners (const.)	-1.542 (1.059)	11.132 (12.983)
OSDG-MP	-0.685 (0.419)	0.039 (5.710)
Buyer or Low-pay	-1.287*** (0.449)	-0.770 (3.643)
OSDG-MP * Buyer or Low-pay	1.073* (0.616)	-7.329 (8.405)
SDG1 earnings	0.004** (0.002)	-0.032 (0.033)
N	184	184
adj. R^2	0.050	0.008
Low-pay in OSDG-MP: p-value	0.606	0.295

Notes: OLS regressions; standard errors in parentheses, adjusted for 50 clusters; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10 shows the results of our regressions for Market-Strangers and the corresponding OSDG-MS. Here we find for subjective well-being a negative overall effect for Market-Strangers, which is similar in OSDG-MS. The other variables show effects that are similar to those for Market-Partners, that is, we find a significant negative impact of having been a buyer but not for having received a low lump-sum income in the OSDG-MS. For social value orientation the regression results show a marginally significant negative overall effect of Market-Strangers, which is not significantly different in the OSDG-MS. In addition, there is a significantly negative effect of being either a buyer in Market-Strangers or a low-pay player in the OSDG-MS. In addition, there is a marginally significantly positive effect of higher earnings in the six periods of the first SDG.

Thus overall we find some evidence that subjective well-being decreases for market-losers but not for low income players in the OSDG and that social value orientation generally decreases. These results are only partially consistent with those of the cooperation level in the SDG. One explanation of this partial disparity is that cooperative attitude, subjective well-being and social value orientation are simply distinct phenomena and don't have to be necessarily in line with each other. A full analysis of this issue could be a very interesting topic for future work.

Table 10. Change in subjective well-being & social value orientation in Market-Strangers and OSDG-MS

	Subjective well-being	Social value orientation
Market-Strangers (const.)	-2.294** (0.902)	-27.881* (14.734)
OSDG-MS	-0.588 (0.380)	0.503 (4.964)
Buyer or Low-pay	-2.249*** (0.341)	-5.576*** (1.792)
OSDG-MS * Buyer or Low-pay	1.897*** (0.548)	6.544 (5.353)
SDG1 earnings	0.007*** (0.002)	0.056* (0.031)
<i>N</i>	264	264
adj. R ²	0.196	0.049
Low-pay in OSDG-MS: p-value	0.411	0.843

Notes: OLS regressions; standard errors in parentheses, adjusted for 50 clusters; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

7 Discussion and Conclusions

We have studied whether the experience of interacting in a competitive market affects the efficiency of cooperation in a subsequent social dilemma game played in pairs. In the markets trade takes place in real time and there is a short and a long side of the market. Participants on the short side have, compared to those on the long side, a strong competitive disadvantage and it is hard for them to secure transactions. Our experimental design allows us to compare the efficiency of cooperation with and without previous market experience, holding earnings constant. We can therefore isolate the pure causal effect of market experience, decoupled from the effect of the earnings inequality produced in markets. In addition, we can compare the effect of market experience on the efficiency of cooperation for participants who competed on the same market with participants who had a comparable market experience but competed on different markets.

Overall, our findings are in line with the view of Bowles (1998) presented in the Introduction but they also qualify it in an important way. Market experience can affect cooperation negatively but it is neither market experience *per se* nor being on the long or short side of the market *per se* that is adverse to efficient cooperation. It is the fact of having competed with each other in the *same* market and on the *same* side that makes subsequent cooperation difficult, irrespective of having been a market-loser or a market-winner. Moreover, market experience can even have a positive effect on subsequent cooperation for market-winners but only when the social dilemma needs to be solved with somebody one has not interacted with before in the same market. We also see that for the case where market experience has been made in different markets, market-winners are better able to sustain efficient cooperation

than market-losers, but that this is not the case when the market experience has been acquired on the same market. This is consistent with the correlational evidence reported in Henrich et al. (2001) and suggests that there may exist a ‘cooperation rent’ for traders who are successful in markets, but only when the market interaction is with ‘strangers’.

We think that our results are of general interest for economists. They provide clean evidence of the effect of market interaction on the efficiency of cooperation for different trader roles and different joint histories of market experience. The results also show that market activity in the same market can have significant and substantial negative spillover effects and impose economic costs in spheres of social interaction outside of the market. It is, of course, possible that the negative spillover effects we find would be smaller or even disappear in a market setting less extreme than the one we studied. However, we do think that market conditions like the ones in our experiment are representative of those in some naturally occurring markets, as for instance, labor markets with high job insecurity. Indeed, the general lesson from our experiments could be that (friction free) markets are good mechanisms for the allocation of resources but that specific market conditions can cause negative spillovers.

We motivated our research questions using the framework of Bowles and Polania-Reyes (2012), who argue that preferences are state-dependent in the sense that “...actions are motivated by a repertoire of heterogeneous preferences the salience of which depends on the nature of the decision situation.” (p.372) The nature of the decision situation can also be affected by social experiences and different experiences can trigger different states. Our results may thus be understood in terms of state-dependent preferences. They are consistent with the notion that experiencing market interaction in a competitive environment causes one to have a less cooperative attitude towards or expect less cooperation from others one has directly competed with. This occurs regardless of whether one has competed with each other on the short or the long side of the market. The fact that this effect is also present for traders on the short side is quite remarkable. It highlights that the issue is not whether people have had competitive experience per se or have been successful in terms of income, but whether one has been in competition with each other or not. It is also interesting that mixed pairs composed by somebody from the short side and somebody from the long side of the market are not affected by their previous market interaction. This can be explained by the fact that the two components of the pair have, albeit on opposite sides of the market, successfully traded with each other.

The results we report call for a refinement of the concept of state-dependence. The question is why exactly certain types of market experience lead to less cooperation. One possible explanation is that direct competition damages affective social ties or may even lead to negative affective ties as discussed in van Dijk and van Winden (1997) and van Winden (2012). This may explain why competition on the same market appears to be harmful for

cooperation while this is not the case when this competitive experience was with somebody else. It is also consistent with the idea that a competitive seller-buyer relation even when it is asymmetric does not damage or even enhance affective ties between the traders (cf. the *doux commerce* idea of Montesquieu, 1748). However, at this point we can not pin down precisely which mechanisms are behind the regularities that we observe. One potentially important input for a better understanding of the results we find would be information about how people's beliefs about others' cooperation will be affected by market experience of different kinds. The investigation of these mechanisms could be an exciting future research avenue.

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Appendix

A Additional Statistics

Table A.1. Differences in contributions in the social dilemma game across market and non-market treatments (period dummies reported)

	Short run	Long run
OSDG-MP (const.)	41.529*** (4.013)	45.804*** (5.975)
Market-Partners	-12.341** (5.023)	-21.892*** (6.801)
OSDG-MS	-4.590 (5.110)	-3.628 (7.518)
Market-Strangers	0.255 (4.258)	-6.923 (6.199)
Period 2	-0.179 (0.982)	0.622 (1.124)
Period 3	-0.663 (1.402)	2.220 (1.481)
Period 4	-3.075** (1.449)	1.167 (1.608)
Period 5	-5.302*** (1.832)	-1.511 (1.905)
Period 6	-25.872*** (1.999)	-3.840* (2.211)
Period 7		-0.919 (1.897)
Period 8		-0.788 (1.814)
Period 9		-0.692 (1.964)
Period 10		-1.177 (2.225)
Period 11		-3.629 (2.589)
Period 12		-26.636*** (3.448)
<i>N</i>	2688	5376
F	24.201	9.891
Prob > F	0.000	0.000
MS vs OSDG-MS: F-statistics	1.870	0.407
MS vs OSDG-MS: p-value	0.172	0.523
MP vs MS: F-statistics	13.617	13.528
MP vs MS: p-value	0.000	0.000

Notes: Tobit regressions with lower limit of 0 and upper limit of 50; standard errors in parentheses, adjusted for 98 clusters;
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.2. Buyer-buyer pairs: Differences in contributions in the social dilemma game across market and non-market treatments (period dummies reported)

	Short run	Long run
OSDG-MP (const.)	46.737*** (5.219)	48.170*** (9.292)
Market-Partners	-18.814*** (6.134)	-27.229** (10.625)
OSDG-MS	-3.944 (6.355)	-2.011 (11.586)
Market-Strangers	-8.380 (5.705)	-11.916 (9.838)
Period 2	-0.522 (1.253)	-0.215 (1.562)
Period 3	-2.180 (1.570)	0.378 (1.876)
Period 4	-5.702*** (2.103)	-3.153 (2.396)
Period 5	-6.736*** (2.482)	-8.254** (3.205)
Period 6	-26.856*** (3.426)	-9.258*** (3.341)
Period 7		-4.396* (2.522)
Period 8		-3.134 (2.681)
Period 9		-3.881 (2.991)
Period 10		-3.313 (3.026)
Period 11		-7.864** (3.706)
Period 12		-27.165*** (4.745)
<i>N</i>	1200	2400
F	10.577	5.040
Prob > F	0.000	0.000
MS vs OSDG-MS: F-statistics	0.929	1.553
MS vs OSDG-MS: p-value	0.335	0.213
MP vs MS: F-statistics	6.129	5.765
MP vs MS: p-value	0.013	0.016

Notes: Tobit regressions with lower limit of 0 and upper limit of 50; standard errors in parentheses, adjusted for 50 clusters;
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3. Seller-seller pairs: Differences in contributions in the social dilemma game across market and non-market treatments (period dummies reported)

	Short run	Long run
OSDG-MP (const.)	37.035*** (7.530)	43.503*** (10.033)
Market-Partners	-11.966 (9.092)	-25.981** (11.931)
OSDG-MS	-8.932 (8.849)	-5.831 (11.949)
Market-Strangers	8.630 (8.406)	-0.476 (10.307)
Period 2	0.851 (1.810)	-1.443 (2.021)
Period 3	1.856 (2.279)	3.782* (2.007)
Period 4	0.638 (2.616)	4.707* (2.582)
Period 5	-3.307 (3.030)	4.427* (2.365)
Period 6	-20.528*** (3.249)	1.340 (2.742)
Period 7		4.278 (2.855)
Period 8		2.623 (3.093)
Period 9		3.743 (3.125)
Period 10		1.730 (3.247)
Period 11		2.181 (3.101)
Period 12		-21.194*** (5.152)
<i>N</i>	744	1488
F	7.731	3.254
Prob > F	0.000	0.000
MS vs OSDG-MS: F-statistics	8.916	0.419
MS vs OSDG-MS: p-value	0.003	0.518
MP vs MS: F-statistics	11.022	9.885
MP vs MS: p-value	0.001	0.002

Notes: Tobit regressions with lower limit of 0 and upper limit of 50; standard errors in parentheses, adjusted for 50 clusters;
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4. Buyer-seller pairs: Differences in contributions in the social dilemma game across market and non-market treatments (Tobit regressions with period dummies)

	Short run	Long run
OSDG-MP (const.)	39.734*** (8.024)	43.432*** (12.072)
Market-Partners	-1.942 (11.186)	-2.735 (15.835)
OSDG-MS	-0.430 (11.424)	-2.292 (16.301)
Market-Strangers	6.377 (9.080)	-1.824 (13.836)
Period 2	-0.490 (2.228)	4.954** (2.491)
Period 3	-0.024 (3.326)	3.892 (3.745)
Period 4	-1.500 (2.977)	5.581 (3.691)
Period 5	-4.597 (3.682)	4.991 (3.652)
Period 6	-29.907*** (4.434)	0.808 (4.546)
Period 7		-0.380 (4.719)
Period 8		-0.301 (4.723)
Period 9		0.050 (4.577)
Period 10		-0.872 (4.718)
Period 11		-2.556 (4.941)
Period 12		-32.177*** (7.514)
<i>N</i>	744	1488
F	6.335	2.702
Prob > F	0.000	0.001
MS vs OSDG-MS: F-statistics	0.542	0.001
MS vs OSDG-MS: p-value	0.462	0.970
MP vs MS: F-statistics	0.872	0.006
MP vs MS: p-value	0.351	0.940

Notes: Tobit regressions with lower limit of 0 and upper limit of 50; standard errors in parentheses, adjusted for 50 clusters; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5. Initial subjective well-being & social value orientation: descriptive statistics

Treatment	N	Initial subjective well-being			Initial social value orientation		
		Median	Mean	St.Dev.	Median	Mean	St.Dev.
Market-Partners							
buyer-buyer	56	3.00	3.05	1.95	3.947	10.436	22.451
seller-seller	28	3.00	3.25	1.43	0.346	9.607	24.015
buyer-seller	28	3.00	3.43	1.64	26.855	15.805	35.962
OSDG-MP							
340-340	24	3.00	3.17	1.58	13.662	20.844	23.802
2672-2672	24	3.00	2.92	1.72	29.763	21.487	47.020
340-2672	24	3.00	3.38	1.79	20.115	14.562	31.870
Market-Strangers							
buyer-buyer	96	3.00	2.91	1.58	17.842	18.421	19.56
seller-seller	48	3.00	3.10	1.53	20.436	17.846	21.854
buyer-seller	48	2.00	2.73	1.70	6.026	15.947	20.827
OSDG-MS							
346-346	24	3.00	3.54	1.72	23.936	20.377	26.736
2656-2656	24	3.00	3.25	1.67	9.465	15.580	39.893
346-2656	24	3.00	3.08	1.82	32.280	27.235	17.550

Note: For subjective well-being a higher value indicates worse well-being; for social value orientation higher degrees (smaller than 90 degree) indicate stronger pro-social value orientation.

Table A.6. Final subjective well-being & social value orientation: descriptive statistics

Treatment	N	Final subjective well-being			Final social value orientation		
		Median	Mean	St.Dev.	Median	Mean	St.Dev.
Market-Partners							
buyer-buyer	56	4.500	4.214	2.417	0.346	8.302	8.312
seller-seller	28	2.000	3.107	2.132	0.000	5.423	17.233
buyer-seller	28	3.000	3.250	1.878	3.304	14.467	22.538
OSDG-MP							
340-340	24	3.000	3.333	2.200	1.565	7.736	41.410
2672-2672	24	3.000	3.375	2.300	24.257	18.938	44.631
340-2672	24	3.000	3.708	2.349	6.502	8.718	30.119
Market-Strangers							
buyer-buyer	96	4.000	4.510	2.299	0.363	8.836	23.267
seller-seller	48	2.000	2.292	1.304	2.242	13.576	18.512
buyer-seller	48	2.000	3.250	2.539	8.855	15.261	18.715
OSDG-MS							
346-346	24	4.000	3.500	1.668	24.431	21.710	25.162
2656-2656	24	3.000	3.625	2.481	7.096	10.245	41.697
346-2656	24	3.000	3.292	1.922	27.170	24.172	20.821

Note: For subjective well-being a higher value indicates worse well-being; for social value orientation higher degrees (smaller than 90 degree) indicate stronger pro-social value orientation.

Table A.7. Change in subjective well-being & social value orientation: descriptive statistics

Treatment	N	Change in subjective well-being			Change in social value orientation		
		Median	Mean	St.Dev.	Median	Mean	St.Dev.
Market-Partners							
buyer-buyer	56	-1.000	-1.161	2.499	-0.336	-2.133	15.284
seller-seller	28	0.000	0.143	2.189	-0.222	-4.184	16.420
buyer-seller	28	0.000	0.179	1.806	0.000	-1.339	22.938
OSDG-MP							
340-340	24	0.000	-0.167	2.036	-0.015	-13.108	46.900
2672-2672	24	0.000	-0.458	1.744	0.156	-2.549	26.233
340-2672	24	0.000	-0.333	2.180	-0.245	-5.844	14.865
Market-Strangers							
buyer-buyer	96	-2.000	-1.604	2.553	-0.697	-9.585	21.128
seller-seller	48	1.000	0.813	1.659	-0.001	-2.370	17.661
buyer-seller	48	0.000	-0.521	2.737	0.000	-2.585	15.540
OSDG-MS							
346-346	24	0.000	0.042	1.083	0.001	1.332	10.009
2656-2656	24	0.000	-0.375	2.183	0.002	-5.335	19.749
346-2656	24	0.000	-0.208	1.956	-0.469	-3.063	20.953

Note: Positive (negative) values indicate improved (worsened) subjective well-being and social value orientation, respectively; change in subjective well-being = initial – final; change in social value orientation = final – initial.

Table A.8. Contributions in the social dilemma game for the different lump-sum income matchings in OSDG-MP and OSDG-MP (OSDG-MP-T) with lump-sum income transparency

Short-run										
Treatment	N	340-340			2672-340			2672-2672		
		median	mean	st. dev.	median	mean	st. dev.	median	mean	st. dev.
OSDG-MP	12	33.542	34.243	9.633	32.875	29.063	15.926	26.500	29.097	15.536
OSDG-MP-T	15	28.333	29.450	16.268	29.833	31.428	17.155	23.083	29.150	13.767
OSDG-MP vs OSDG-MP-T		$p = 0.3924$			$p = 0.5734$			$p = 0.9222$		
Long-run										
Treatment	N	340-340			2672-340			2672-2672		
		median	mean	st. dev.	median	mean	st. dev.	median	mean	st. dev.
OSDG-MP	12	41.104	33.038	15.326	35.604	31.038	17.182	38.521	34.222	15.635
OSDG-MP-T	15	35.833	29.622	20.295	39.125	29.967	19.162	28.125	29.625	15.679
OSDG-MP vs OSDG-MP-T		$p = 0.9610$			$p = 0.9416$			$p = 0.2609$		

Note: all statistics are based on strictly independent observations; p -values based on Mann-Whitney rank sum tests, two-sided.

B Experiment Instructions

This section contains an English translation of the general instructions, which were read aloud at the beginning of a session and which were the same in all treatments, and the translated specific instructions with the original Spanish screen shots of the Market-Strangers treatment. Differences between Market-Strangers and Market-Partners are indicated between / / (see screens 16, 26, 36, below).

The instructions of OSDG-MP and OSDG-MS were identical to those of Market-Strangers except that there were not market instructions (and comprehension questions related to markets). Some slight rephrasing of the social dilemma instructions was necessary and is indicated between / / (see screens 16, 26, below). The full set of the original Spanish instructions is available from the authors upon request.

GENERAL INSTRUCTIONS

“READ OUT ALOUD AT THE BEGINNING OF THE EXPERIMENT”

Instructions

Welcome to this experiment. The purpose of this experiment is to study how individuals make decisions in different situations. The instructions are simple and if you follow them carefully you can earn a considerable amount of money with the decisions you make. How much you earn may also depend on the decisions of other participants and on random events. The total amount of money you earn in the experiment will be paid out to you in cash confidentially at the end of the experiment. Nobody will learn the payments received by other participants. During the experiment you can ask questions at any moment. Please do not ask the questions aloud but raise your hand. One of the experimenter team will come to you to answer your question. Apart from these questions, **any kind of communication other than specified in the instructions is not allowed** and will lead to the immediate exclusion from the experiment.

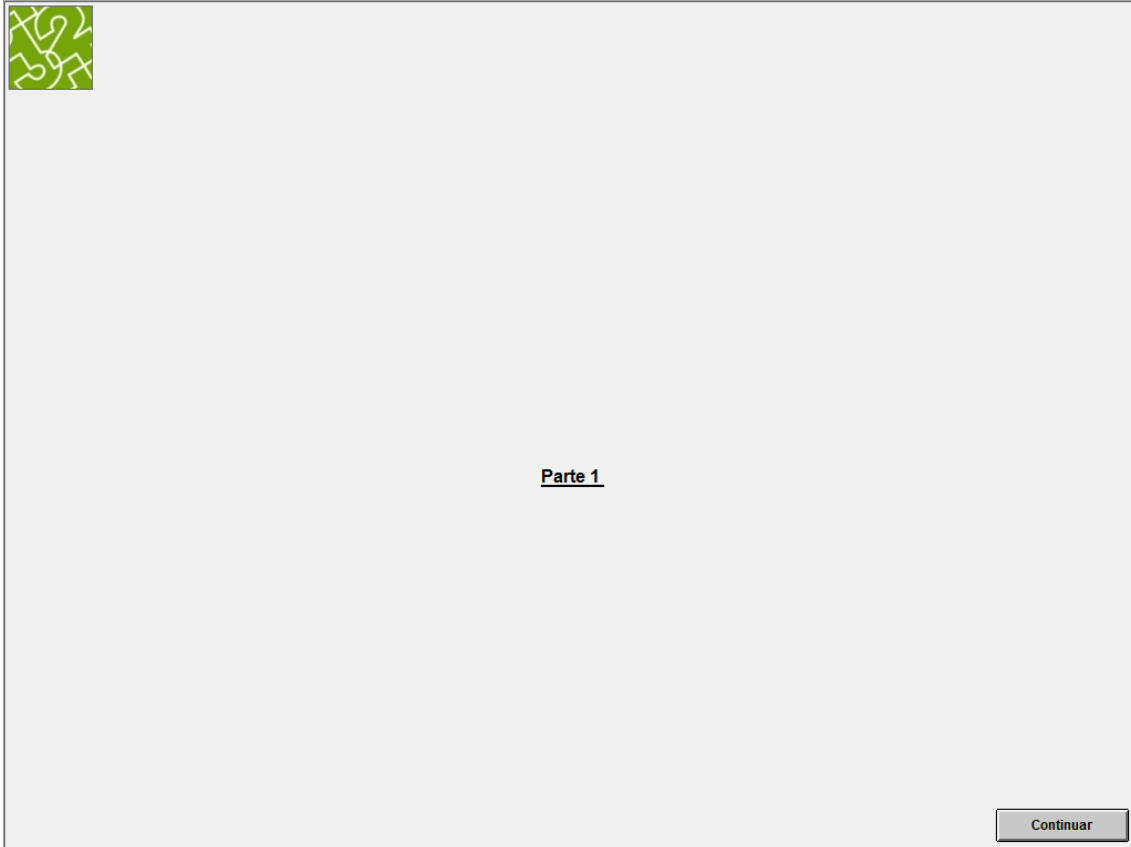
1. This experiment consists of several parts. These are the “General Instructions” which apply to all parts of the experiment. You will receive the instructions for the different parts at the beginning of each part.
2. In some parts you will learn about (parts of) the earnings received but in some parts you will not learn your earnings immediately. Only at the end of the experiment, you will be informed about all your earnings in each part and your total earnings. In the experiment we will not talk of Euro but of ECU. At the end of the experiment, all your earnings will be exchanged at the exchange rate of
100 ECU = 1 EUR.
3. At the beginning of each part, you will see the corresponding instructions on the screen or you will be handed over new instructions on paper.

SPECIFIC INSTRUCTIONS AND SCREEN SHOTS

“READ BY SUBJECTS AT THEIR OWN PACE”


SCREENS and INSTRUCTIONS for Market-Strangers

Screen 1

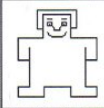


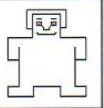
Part1

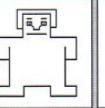
Screen 2

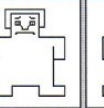



Por favor indica con la ayuda de la imagen como te sientes en este momento.











☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

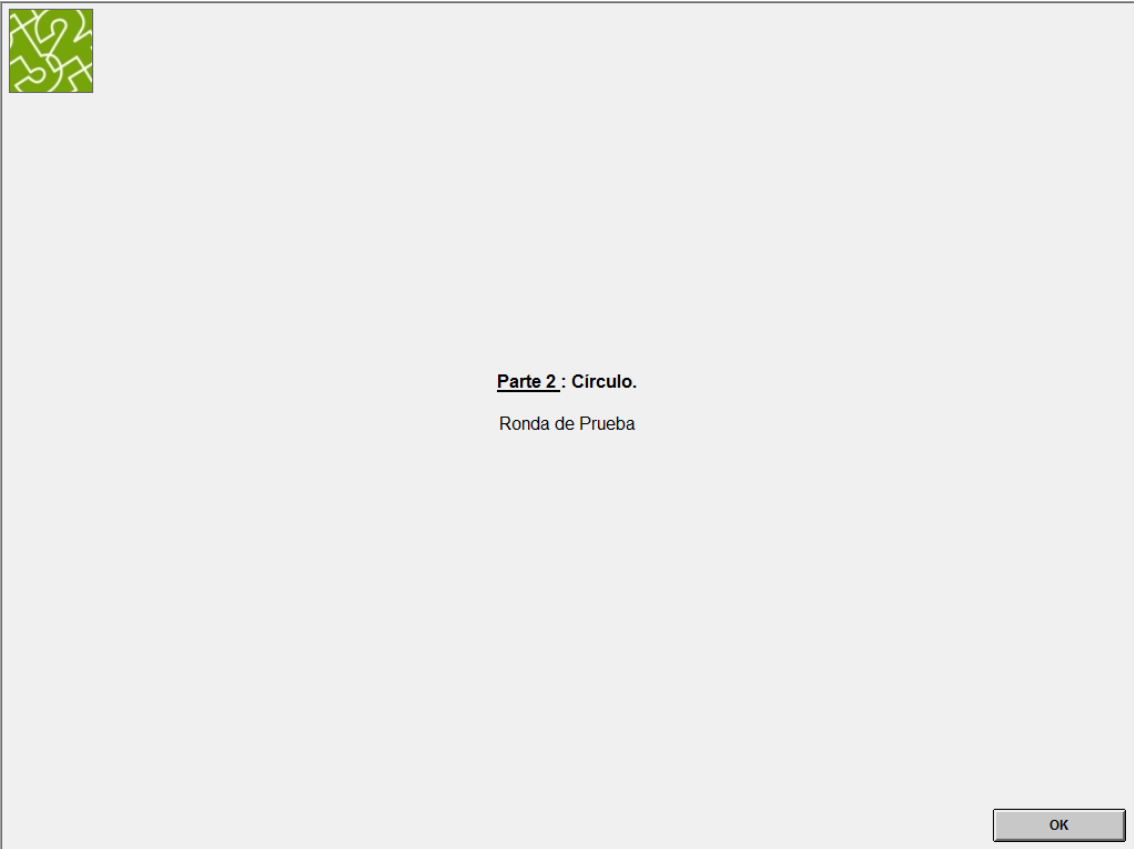
☐ 8

☐ 9

OK

Please indicate with the help of the image how you feel at this moment.

Screen 3



Part 2: Circle

Trial Round

Screen 4



Instrucciones

1. En esta parte del experimento vas a tomar una única decisión. Tu decisión consiste en elegir una distribución de ECUs entre tú y otro participante. El otro participante lo seleccionará el servidor de manera aleatoria y no vas a interactuar con él/ella en ninguna otra parte del experimento. Además, este emparejamiento no es recíproco, esto es, el participante al que le asignas una cantidad de ECUs con tu decisión no es el mismo que el que te asigna una cantidad de ECUs a ti.
 2. En la pantalla verás una circunferencia. Seleccionando un punto de esta circunferencia asignas una cantidad de ECUs para ti y una para el otro participante. Cada punto de la circunferencia corresponde a una cantidad que será sumada (o restada) de tus ingresos y a una cantidad que será sumada (o restada) de los ingresos del participante con el que estás conectado. Tomando esta decisión puedes incrementar (o reducir) tus ingresos y los del otro participante. Las distribuciones factibles están comprendidas entre + 200 ECUs y -200 ECUs.
 3. Con la ayuda del ratón podrás hacer "click" en cualquier punto de la circunferencia. Al hacer eso se dibujará una flecha que unirá el centro de la circunferencia con el punto que hayas seleccionado. Además, debajo de la circunferencia se te mostrarán las cantidades exactas de ECUs que has seleccionado para ti y para el otro participante con el que estás conectado.
 4. Tus ingresos en esta parte se determinarán por tu decisión (la cantidad de ECUs que te asignas a ti mismo), y por los ECUs que te asigne el participante que está conectado contigo. Recuerda que este no es el mismo al que tu asignas ECUs con tu decisión. Concretamente tus ingresos en esta parte serán la suma de esas dos cantidades.
- NOTA: Las cantidades pueden ser positivas y negativas. Puede darse el caso de que la cantidad resultante de la suma de las dos cantidades sea negativa.
5. Podrás cambiar tu decisión hasta que estés satisfecho con tu decisión clickando en distintos puntos. Cuando estés satisfecho de tu decisión, confírmala pulsando el botón OK.

OK

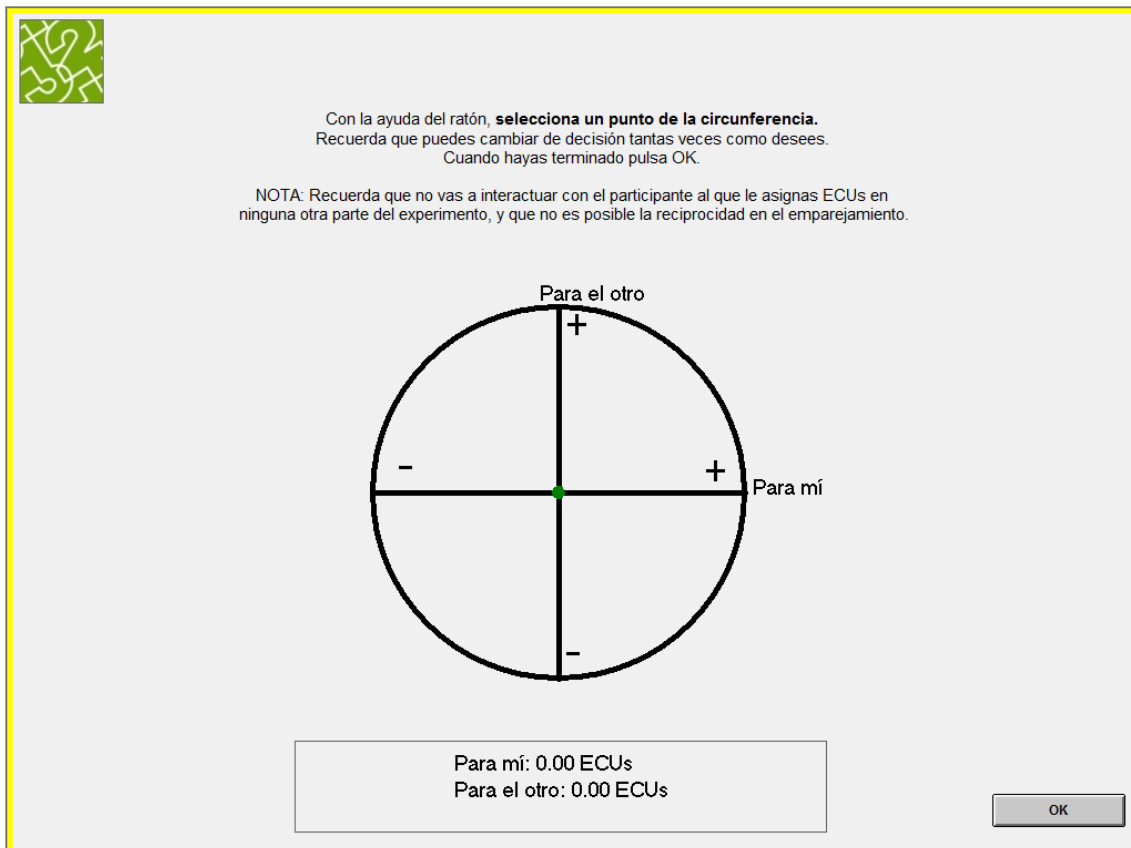
Instructions

1. In this part of the experiment you are going to take just one decision. Your decision consists in choosing a distribution of ECUs between you and another participant. The server will choose the other participant randomly and you are not going to interact with him/her in any other part of the experiment. Furthermore, this matching is not reciprocal, that is the other participant, to whom you can allocate an amount of ECUs with your decision, is not the same who can allocate an amount of ECUs to you.
2. You are going to observe a circle on the screen. By choosing a point on this circle you allocate an amount of ECUs to you and to the other participant. Each point on the circle corresponds to an amount that will be added to (or subtracted from) your earnings and the other participant's earnings with whom you are connected. By taking your decision you can increase (or reduce) your earnings and the earnings of the other participant. The feasible distributions range from +200 ECUs to -200 ECUs.
3. With the help of the mouse you will be able to click on any point on the circle. If you do that an arrow will be drawn, which connects the center of the circle with the point that you will have selected. Moreover, the exact amount of ECUs that you have selected for you and for the other participant will be shown below the circle.
4. Your earnings in this part will be determined by your decision (the amount of ECUs that you allocate to yourself), and by the ECUs that the participant who is connected with you allocates to you. Remember that the latter is not the same than the one to whom you allocate ECUs with your decision. Concretely, your earnings in this part will be the sum of these two amounts.

NOTE: The amounts can be positive or negative. It can be the case that the sum of the two amounts is negative.

5. You will be able to change your decision until you are satisfied with your decision by clicking on different points on the circle. When you are satisfied with your decision you have to confirm it by clicking on the OK button.

Screen 5



With the help of the mouse select a point on the circle. Remember that you can change your decision as many times as you wish.

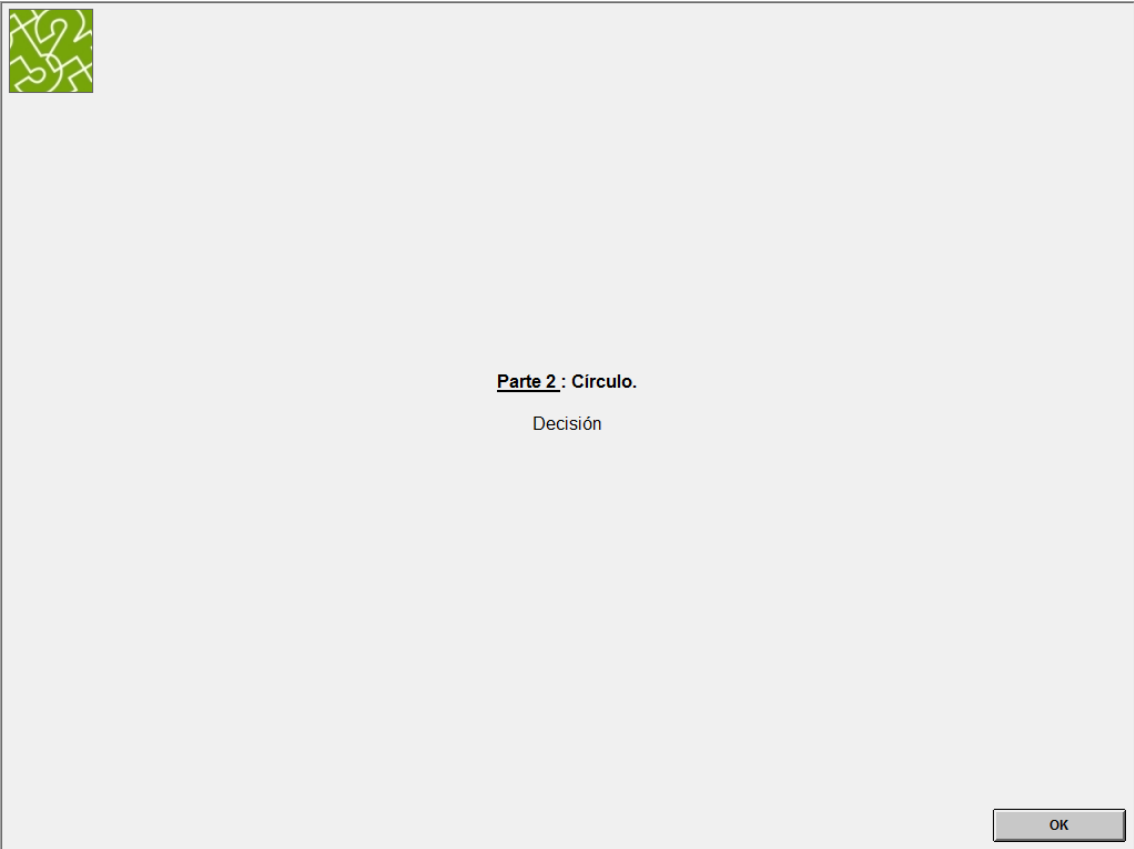
When you are finished press OK.

NOTE: Remember that you will not interact with the participant to whom you assign ECUs in no other part of the experiment and that reciprocity in the matching.

FOR ME: 0.00 ECUs

FOR THE OTHER: 0.00 ECUs

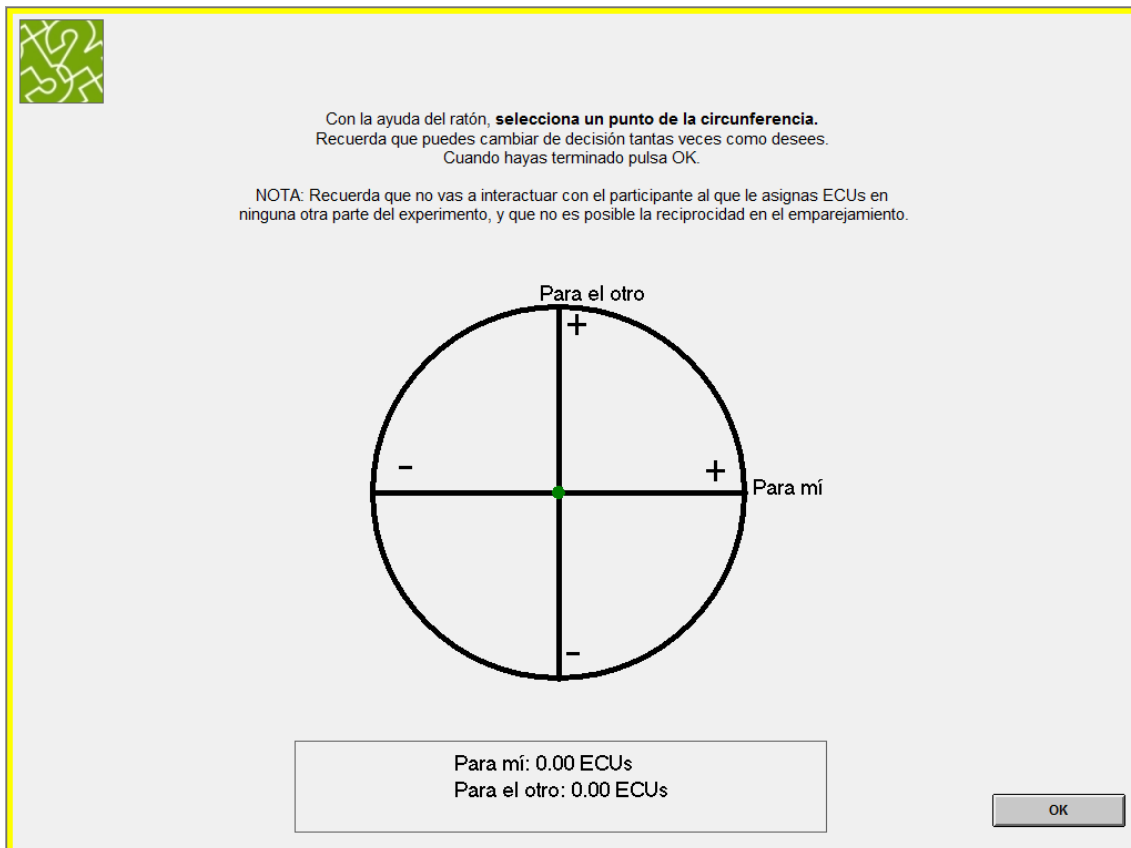
Screen 6



Part 2: Circle

Decision

Screen 7



With the help of the mouse select a point on the circle. Remember that you can change your decision as many times as you wish.


When you are finished press OK.

NOTE: Remember that you will not interact with the participant to whom you assign ECUs in no other part of the experiment and that reciprocity in the matching.

FOR ME: 0.00 ECUs

FOR THE OTHER: 0.00 ECUs

Screen 8



Ronda

1 de 2

Tiempo restante [seg] 0


Parte 3 : Mercados

Continuar

Part 3: Markets

BUYERS

Screen 9



Ronda

1 de 2

Tiempo restante [seg] 0

Instrucciones

1. Esta parte del experimento consta de 24 rondas. Estas 24 rondas están divididas en 18 rondas en las que tú y los demás participantes actuaréis en un mercado y, después, 6 rondas en las que cada participante estará emparejado con exactamente otro participante para tomar decisiones en otra situación.

2. En las primeras 18 rondas actuarás como comerciante en un mercado con otros 7 participantes. Por tanto, en total habrá 8 comerciantes en el mercado. Estos 8 comerciantes serán los mismos durante las 18 rondas.

3. Cada participante será o comprador o vendedor. En cada ronda habrá 3 vendedores y 5 compradores en el mercado. Cada vendedor será vendedor durante la totalidad de las 18 rondas y cada comprador será comprador durante la totalidad de las 18 rondas. El servidor ha determinado aleatoriamente **que serás comprador** en esta parte del experimento.

4. El bien que se comerciará estará dividido en distintas "unidades". No especificaremos un nombre para este bien, simplemente nos referiremos a unidades del bien. En cada ronda los vendedores pueden vender sus unidades a los compradores. Los precios que se negocien determinarán los ingresos en ECUS de cada uno de los comerciantes.


5. En lo que sigue explicaremos primero como tú como comprador puedes ganar dinero comprando unidades. Después, explicaremos de qué manera se producen las ventas y las compras en el mercado.

Continuar

Instructions

1. This part of the experiment consists of 24 rounds. These 24 rounds are split into 18 rounds in which you and the other participants will act in a market and, thereafter, 6 rounds where each participant will be paired with exactly one other participant to make decisions in another situation.
2. In the first 18 rounds you will act as a trader in a market with 7 other participants. Hence, in total there will be 8 traders active in the market. These 8 traders will stay the same for all 18 rounds.
3. Each participant will be either a buyer or a seller. In each round there will be 3 sellers and 5 buyers active in the market. Each seller stays a seller throughout all 18 rounds and each buyer stays a buyer for all 18 rounds. The server has randomly determined that **you will be a buyer** in this part of the experiment.
4. The good to be traded is divided into distinct "units". We will not specify a name for the good but simply refer to units of the good. In each round sellers can sell their units to the buyers. The prices that are negotiated will determine each trader's earnings in ECUs.
5. In the following we will first explain how you as a buyer can earn money through purchasing units. Thereafter, we will explain how sales and purchases are take place in the market.

Screen 10



Ronda

1 de 2

Tiempo restante [seg] 0

Unidades a comprar y valores de los compradores:
En cada ronda, cada comprador puede comprar hasta 2 unidades, pero es libre de no comprar ninguna o de comprar sólo una. Por cada unidad comprada durante una ronda un comprador recibe un valor de comprador de 100 ECUs. Por una unidad que un comprador no compre el comprador no recibe ningún valor de comprador para esa unidad.

Ingresos de un comprador
Los compradores ganan dinero comprando unidades a precios por debajo de sus valores de comprador. Estas ganancias se computan restando el precio de cada unidad de su valor de comprador. Por tanto,

$$\text{Ingresos del comprador de la unidad} = 100 - \text{precio de compra de la unidad}$$

Si un comprador no compra ninguna unidad en una ronda, este comprador no gana ningún ECU en esa ronda.

Por cada unidad que un vendedor venda el vendedor tiene que pagar un coste de venta y puede ganar dinero vendiendo la unidad a un precio superior al coste de venta. En cada ronda, cada vendedor puede vender hasta 2 unidades, pero puede también vender sólo una unidad o no vender ninguna. Si un vendedor no vende ninguna unidad en una ronda, este vendedor no gana ningún ECU en esa ronda.

Los precios a los que vendedores y compradores pueden comerciar son todos los números enteros entre 10 y 95. Es decir, los precios a los que está permitido comerciar son 10, 11, 12, 13, 14, ..., 92, 93, 94, 95.

6. Cada ronda durará un máximo de 3 minutos. Las unidades que al final de los 3 minutos no se hayan intercambiado se pierden, es decir, no pasan a la ronda siguiente.

7. Los valores de los compradores y los costes de los vendedores son información privada y no serán revelados ni durante ni después del experimento.

AnteriorContinuar

Units to buy and buyer values:

In each round, each buyer can buy up to 2 units, but is free to buy no or only one unit. For each unit purchased during a round a buyer receives a buyer value of 100 ECUs. For a unit a buyer does not purchase the buyer does not receive any buyer value for that unit.

Buyer earnings:

Buyers make profits by purchasing units at prices that are below their buyer values. These profits are computed by subtracting each unit's price from its buyer value. Therefore,

$$\text{buyer's earnings per unit} = 100 - \text{purchasing price for unit.}$$


If a buyer does not purchase any unit in a round, this buyer does not earn any ECU's in this round.

For each unit a seller sells, the seller has to pay selling costs and can earn money by selling the unit at a price higher than the selling costs. In each round, each seller can sell at most 2 units, but may also sell no or only one unit. If a seller does not sell any unit in a round, this seller does not earn any ECU's in this round.

The prices at which sellers and buyers are allowed to trade are all inter numbers between 10 and 95. That is the permitted trading prices are {10, 11, 12, 13, 14, ..., 92, 93, 94, 95}.

- Each round will last a maximum of 3 minutes. The units that have not been exchanged at the end of the 3 minutes are lost, that is, they are not carried over to the next round.
- Buyer values and seller costs are private information and will not be revealed neither during nor after the experiment.

Screen 11



Ronda

1 de 2

Tiempo restante [seg] 0

Reglas para hacer transacciones:

En cada ronda valen las siguientes reglas para hacer transacciones:

1. Los compradores hacen ofertas de compra y los vendedores hacen ofertas de venta. Una oferta de un comprador consiste en ofrecer un precio al que comprar. Una oferta de un vendedor consiste en ofrecer un precio al que vender.
2. Solamente la oferta de compra más alta y la oferta de venta más baja son los denominados precios pendientes a los que pueden tener lugar las transacciones.
3. El precio de transacción es siempre el precio de la oferta de compra (venta) pendiente. Se produce una transacción si una oferta de compra (venta) pendiente es aceptada por un vendedor (comprador). Para ello hay que seleccionar la oferta pendiente y hacer click en Comprar (Vender).
4. Nuevas ofertas de precios tienen que ser mejoras. Es decir, una nueva oferta de compra (venta) tiene que ser superior (inferior) al precio de la oferta de compra (venta) pendiente.
5. Si se produce una transacción el mercado se vacía y cualquier precio de oferta de compra o de oferta de venta en el intervalo factible vuelve a ser posible. Observa que los precios de ofertas de compra (de ofertas de venta) tienen que ser iguales o inferiores (superiores) al correspondiente valor del comprador (coste de venta del vendedor).
6. Las unidades del bien se comercian una a una. Es decir, no se pueden ofertar ni comerciar varias unidades a la vez.

A continuación se muestra un ejemplo.

AnteriorContinuar

Rules for making transactions

In each round there are the following rules for making transactions:

1. Buyers make buying offers and sellers make selling offers. A buying offer consists offering a price at which to purchase. A selling offer consists in offering a price at which to sell.
2. Only the highest buying offer and the lowest selling offers are the so-called standing prices at which trades can take place.
3. The transaction price is always the standing buying (selling) price. A transaction takes place if the standing buying (selling) is accepted by a seller (buyer).
4. Newly submitted price offers have to be improvements. That is, a new buying (selling) price has to be higher (lower) than the standing buying (selling) price.
5. If a transaction takes place the market clears and any buying and selling price in the feasible range are possible again. Note, that the prices of the buying offers (selling offers) bid (ask) prices have to be equal or lower (higher) than the corresponding buyer value (seller selling cost).
6. The units of the goods are traded one by one. That is, it is not possible to offer or exchange several units at the same time.

In what follows we show you an example.

Screen 12

This is the screen a buyer faces when making and accepting offers in a round, which is explained on the next screen.

Ronda

1 de 2

Tiempo restante [seg] 0


Comprador		Unidades del bien que puedes comprar	Unidades del bien ya compradas	
<div>Para <u>aceptar</u> una oferta de venta haz click en la de <u>menor precio</u> y después en el botón <u>Comprar</u>.</div>	Ofertas de venta	Precios de Transacción	Ofertas de Compra	<div>Haz aquí tu <u>Oferta de Compra</u>.</div> <div>50</div> <div>Oferta de Compra</div>
	15	16	45	
	12	23	50	
	<div>Comprar</div>			

Pulsa a Continuar para ver la explicación.

Anterior

Continuar

Screen 13



Ronda

1 de 2

Tiempo restante [seg] 0

Esta es una pantalla de ejemplo de un comprador en un mercado en el que se han realizado dos ofertas de venta (columna izquierda), dos transacciones (columna central) y dos ofertas de compra (columna derecha).

En la fila superior, se muestra como este comprador ya ha comprado una unidad del bien, y por tanto le queda aún otra unidad del bien que puede comprar.

Ofertas de venta

Un vendedor ha realizado una oferta de venta de 15. Posteriormente otro vendedor (o el mismo que realizó la anterior) ha realizado una oferta de venta 12. El precio pendiente es el de menor precio, en este caso 12.

Precios transacción

Este comprador ya ha realizado una transacción (Compra) por un valor de 23 ECUs (valor resaltado en azul). Otros participantes de tu mercado han realizado una transacción por el valor de 16 ECUs

Ofertas de compra

Otro comprador ha realizado una oferta de compra de 45 ECUs. Posteriormente el comprador del ejemplo ha realizado una oferta de 50 ECUs (resaltada en azul). El precio pendiente es 50.

Anterior

Continuar

This is an example screen of a buyer in a market in which two selling offers (left column), two transaction (central column) and two buying offers (right column) have been made.

In the top row, it is shown that this buyer has already purchased one unit of the good, and therefore he still can buy one other unit.

Selling offers

A seller has made a selling offer of 15. After that another seller (or the same that made the earlier offer) has made a selling offer of 12. The standing price is the lower price, in this case 12.

Transaction prices

This buyer has already made one transaction (purchase) for a value of 23 ECUs (value shown in blue). Other participants of your market have made a transaction for a value of 16 ECUs.

Buying offers

Another buyer has made a buying offer of 45 ECUs. After that the buyer of the example has made an offer of 50 ECUs (highlighted in blue). The standing price is 50.

Screen 14


This screen is the same as screen 12, but with the highlighted items mentioned on screen 13.

Ronda

1 de 2

Tiempo restante [seg] 0

Comprador	Unidades del bien que puedes comprar 2	Unidades del bien ya compradas 0
-----------	---	-------------------------------------


<p>Para aceptar una oferta de venta haz click en la de <u>menor precio</u> y después en el botón <u>Comprar</u></p>	Ofertas de venta	Precios de Transacción	Ofertas de Compra	<p>Haz aquí tu <u>Oferta de Compra</u></p>
	<div>15</div> <div>12</div> <div>  <p>Para aceptar el precio de la oferta de venta pendiente, seleccionala con el ratón y pulsa en el botón Comprar</p> </div> <div>Comprar</div>			

Esta pantalla te recuerda como aceptar la oferta de venta pendiente.

Anterior

Continuar

Screen 15



Ronda

1 de 2

Tiempo restante [seg] 0

Este es el final de las instrucciones para el mercado en el que actuarás como comerciante. Este mercado durará 18 rondas. Después de 18 rondas participarás durante otras 6 rondas (las rondas 19 a 24) en otra situación de toma de decisiones. Esto se explicará a continuación.

AnteriorContinuar

This is the end of the instructions for the market where you will act as a trader. This market will last for 18 rounds. After 18 rounds you will participate for another 6 rounds (rounds 19 to 24) in another decision making situation. This will be explained below.

Screen 16

Ronda

1 de 1

Tiempo restante [seg] 0

7. En cada uno de las rondas después del mercado, estarás emparejado con otro participante. Este participante será el mismo durante las 6 rondas. Serás emparejado con **otro comprador de otro mercado con el que no has interactuado en el mercado.**

8. En cada ronda, cada participante recibe una asignación de 50 ECUs. En cada ronda la decisión a tomar es cuánto asignar a un fondo A y cuánto a un fondo B. En cada ronda, tendrás que decidir cuantos ECUs depositar en el fondo B y el resto será asignado automáticamente al fondo A.

9. Por cada ECU que asignes al fondo A tus ingresos aumentarán en 1 ECU.

10. Por cada ECU que asignes al Fondo B tus ingresos aumentarán en 0.9 ECUs, y también aumentarán en 0.9 ECUs los ingresos de la persona con la que estés emparejado. Por tanto, cada ECU asignado al Fondo B aumenta los ingresos conjuntos tuyos y de la otra persona en 1,8 ECUs. Esto también se cumple para cada ECU que la otra persona asigne al fondo B. Por tanto, observa que tus ingresos del fondo B así como tus ingresos totales dependen de tu asignación al fondo B y de la asignación al fondo B de la persona con la que estés emparejado.

11. En resumen, tus ingresos totales en una ronda se determinan de la forma siguiente:

$$\text{Ing. individual} = \text{Ing. Fondo A} + \text{Ing. Fondo B}$$

$$50 \text{ ECUs} - \text{mi asignación al F}^\circ \text{ B} + (0.9 \times \text{F}^\circ \text{ B mio}) + (0.9 \times \text{F}^\circ \text{ B del otro})$$

Observa que los ingresos de la otra persona se calculan de forma equivalente.

12. Al final de cada ronda se te informará de la cantidad que haya asignado al fondo B la persona con la que estás emparejado. Además, recibirás información acerca de tus ingresos y los de la otra persona en cada ronda. Esta información relativa a las asignaciones e ingresos de todas las rondas pasadas aparecerá en la pantalla de tu ordenador.

Anterior

Continuar

7. In each of the rounds that follow the market, you are paired with one other participants. This other participant will be the same throughout these 6 rounds. You will be paired with **another buyer [in buyer-seller pairs: “another seller”] from another market with whom you have not interacted in the market [in Market-Partners: “another buyer [in buyer-seller pairs: “another seller”] with whom you have also interacted in the market.”]**

[In OSDG-MS (OSDG-MP) this item read: “In each of the rounds that follow, you are paired with one other participants. This other participant will be the same throughout these 6 rounds. You have been assigned initial earnings of 346~ECU (340~ECU). The other group member is also assigned some initial earnings. The assignments to you and the other group member are not necessarily the same. You and the other group member will receive this amount independently of what occurs during the experiment.”]

[In OSDG-MS (OSDG-MP) with lump-sum income transparency this item read: “In each of the rounds that follow, you are paired with one other participants. This other participant will be the same throughout these 6 rounds. You have been assigned initial earnings of 346~ECU (340~ECU). The other group member is assigned initial earnings of 346~ECU (340~ECU). [in mixed-pay pairs: “The other group member is assigned initial earnings of 2656~ECU (2672~ECU).”] You and the other group member will receive this amount independently of what occurs during the experiment.”]

8. In each round, each participant receives an endowment of 50 ECUs. In each round the decision to be made is to choose how much you allocate to a Fund A and to a Fund B. In each round, you will have to decide how many ECUs to deposit in fund B and the rest will be allocated to fund A automatically.

9. For each ECU that you allocate to fund A your earnings will increase by 1 ECU.

10. For each ECU that you allocate to fund B, your earnings will increase by 0.9 ECUs, and also the earnings of the other person you are paired with will increase by 0.9 ECUs. Hence, each ECU allocated to fund B increases your and the other's earnings together with 1.8 ECU. This also holds for each ECU the other person allocates to fund B. Hence, note that your earnings from fund B as well as your total earnings, depend on your allocation to fund B and on the allocation to fund B of the person you are paired with.


11. In summary, your total earning in one round are determined in the following way:

$$\begin{aligned} \text{Individual earnings} = & \text{Earnings fund A} + \text{Earnings fund B} \\ & 50 \text{ ECU} - \text{my allocation to fund B} + (0.9 \times \text{my allocation to fund B}) + \\ & (0.9 \times \text{other person's allocation to fund B}) \end{aligned}$$

Note, that the earnings of the other person are calculated in an equivalent way.

12. At the end of each round, you will be informed of the allocation to fund B of the person you are paired with. Moreover, you will receive information on your and the other person's earnings in each round. This information regarding the allocation and earnings of all previous rounds will appear on your computer screen.

Screen 17

 Ronda

1 de 2

Tiempo restante [seg] 0

Por favor, contesta las preguntas siguientes. El experimento sólo continuará después de que todos los participantes hayan contestado correctamente a todas las preguntas.

1. Esta parte del experimento ¿cuántas rondas tiene en total?
2. Primero comerciarás bienes en un mercado. ¿Durante cuántas rondas funcionará el mercado?
3. En el mercado hay vendedores y compradores. Tú eres comprador. En total, ¿cuántos vendedores y compradores habrá en el mercado? vendedores
 compradores
4. En cada ronda los vendedores pueden vender unidades y los compradores pueden comprar unidades.
¿Cuántas unidades puede como máximo vender cada vendedor?
¿Cuántas unidades puede como máximo comprar cada comprador?
5. En cada ronda los participantes que actúan como compradores o vendedores en el mercado son los mismos ☐ SI
☐ NO
6. Como comprador puedes ganar dinero comprando unidades por debajo de tu valor de comprador. Considera el siguiente ejemplo arbitrario. Para cada unidad que compres tu valor de comprador es 85 ECUs. En una cierta ronda, compras una unidad a un precio de 34 ECUs y otra unidad a 76 ECUs. ¿Cuáles son tus ingresos totales en la ronda?
7. Como comprador puedes ganar dinero comprando unidades por debajo de tu valor de comprador. Considera el siguiente ejemplo arbitrario. Para cada unidad que compres tu valor de comprador es 85 ECUs. En una cierta ronda, no compras ninguna unidad. ¿Cuáles son tus ingresos totales en la ronda?

Please answer the following questions. The experiment will proceed only after all participants have correctly answered all questions.

1. This part of the experiment has in total how many rounds.
Answer: XXX rounds
2. First you will trade goods on a market. For how many rounds will the market be open?
Answer: XXX rounds
3. In the market there are sellers and buyers. You are a buyer. In total, how many sellers and buyers will be active on the market?
Answer: XXX sellers, XXX buyers
4. In each round sellers can sell units and buyers can buy units. How many units can each seller sell at most and each buyer buy at most?
Answer: X units
5. In each round the same participants will be active as buyers and sellers on the market?
Answer: YES NO


6. As a buyer you can earn money by buying units at prices below your buyer value. Consider the following arbitrary example. For each unit you buy your buyer value is 85 ECU. In a given round, you buy one unit at a price of 34 ECU and another unit at a price of 76 ECU. What are your total earnings in that round?

Answer: XX ECU

7. As a buyer you can earn money by buying units at prices below your buyer value. Consider the following arbitrary example. For each unit you buy your buyer value is 85 ECU. In a given round, you do not buy any unit. What are your total earnings in that round?

Answer: XX ECU

Screen 18



Ronda
1 de 2

Tiempo restante [seg] 0

8. Después de 18 rondas termina la interacción de mercado y serás emparejado con otro participante para otra situación de toma de decisiones, donde tú y el otro participante tendréis que asignar 50 ECUs al fondo A y al fondo B en cada ronda. ¿Cuántas rondas durará esta otra situación de toma de decisiones?

9. En todas las rondas de esta otra situación de toma de decisiones ¿estarás emparejado con el mismo participante?

10. En cada ronda estarás emparejado con:

☐ SI
☐ NO

☐ un vendedor con el que has interactuado en el mercado
☐ un vendedor con el que NO has interactuado en el mercado
☐ un comprador con el que has interactuado en el mercado
☐ un comprador con el que NO has interactuado en el mercado

Marcar la respuesta correcta

11. En esta otra situación de toma de decisiones, considera la siguiente situación arbitraria en una ronda: Tu asignación al fondo B es de 50 ECUs, la asignación y la asignación al fondo B de la persona con la que estás emparejada es de 50 ECUs. En esta situación

Tu ingresos serían

Los ingresos de la persona con la que estás emparejada serían

12. En esta otra situación de toma de decisiones, considera la siguiente situación arbitraria en una ronda: Tu asignación al fondo B es de 0 ECUs, la asignación y la asignación al fondo B de la persona con la que estás emparejada es de 0 ECUs. En esta situación

Tu ingresos serían

Los ingresos de la persona con la que estás emparejada serían

13. En esta otra situación de toma de decisiones, considera la siguiente situación arbitraria en una ronda: Tu asignación al fondo B es de 15 ECUs, la asignación y la asignación al fondo B de la persona con la que estás emparejada es de 35 ECUs. En esta situación

Tu ingresos serían

Los ingresos de la persona con la que estás emparejada serían

8. After 18 rounds the market interaction is over and you will be paired with one other participant for another decision making situation, where you and the other participant will have to allocate 50 ECU to fund A and fund B in each round. How many rounds will this other decision making situation last?

Answer: XX rounds

9. In all 6 rounds of this other decision making situation you are paired with the same other participant?

Answer: YES NO

10. In each round you are paired with:

- ☐ a seller you have interacted with in the market
☐ a seller you have NOT interacted with in the market
☐ a buyer you have interacted with in the market
☐ a buyer you have NOT interacted with in the market

(check the correct answer)

11. In this other decision making situation, Consider the following arbitrary situation in a round:
Your allocation to the fund B is 50 ECU, the allocation to fund B of the person you are

paired with is 50 ECU.

In this situation

your earnings would be:

the earnings of the person you are paired with would be:

12. In this other decision making situation. Consider the following arbitrary situation in a round:

Your allocation to the fund B is 0 ECU, the allocation to fund B of the person you are paired with is 0 ECU.

In this situation

your earnings would be:

the earnings of the person you are paired with would be:

13. In this other decision making situation. Consider the following arbitrary situation in a round:

Your allocation to the fund B is 12 ECU, the allocation to fund B of the person you are paired with is 34 ECU.


In this situation

your earnings would be:

the earnings of the person you are paired with would be:

SELLERS

Screen 19



Ronda

1 de 2

Tiempo restante [seg] 0

Instrucciones


1. Esta parte del experimento consta de 24 rondas. Estas 24 rondas están divididas en 18 rondas en las que tú y los demás participantes actuaréis en un mercado y, después, 6 rondas en las que cada participante estará emparejado con exactamente otro participante para tomar decisiones en otra situación
2. En las primeras 18 rondas actuarás como comerciante en un mercado con otros 7 participantes. Por tanto, en total habrá 8 comerciantes en el mercado. Estos 8 comerciantes serán los mismos durante las 18 rondas.
3. Cada participante será o comprador o vendedor. En cada ronda habrá 3 vendedores y 5 compradores en el mercado. Cada vendedor será vendedor durante la totalidad de las 18 rondas y cada comprador será comprador durante la totalidad de las 18 rondas. El servidor ha determinado aleatoriamente **que serás vendedor** en esta parte del experimento.
4. El bien que se comerciará estará dividido en distintas "unidades". No especificaremos un nombre para este bien, simplemente nos referiremos a unidades del bien. En cada ronda los vendedores pueden vender sus unidades a los compradores. Los precios que se negocien determinarán los ingresos en ECUS de cada uno de los comerciantes.
5. En lo que sigue explicaremos primero como tú como vendedor puedes ganar dinero vendiendo unidades. Después, explicaremos de qué manera se producen las ventas y las compras en el mercado.

Continuar

Instructions

1. This part of the experiment consists of 24 rounds. These 24 rounds are split into 18 rounds where you and the other participants will act on a market and, thereafter, 6 rounds where each participant will be paired with exactly one other participant to make allocation decisions in another situation.
2. In the first 18 rounds you will act as a trader on a market with 7 other participants. Hence, in total there will be 8 traders active on the market. These 8 traders will stay the same for all 18 rounds.
3. Each participant will be either a buyer or a seller. In each round there will be 3 sellers and 5 buyers on the market. Each seller stays a seller throughout all 18 rounds and each buyer stays a buyer for all 18 rounds. The server has randomly determined that **you will be a seller** in this part of the experiment.
4. The good to be traded is divided into distinct "units". We will not specify a name for the good but simply refer to units. In each round sellers can sell their units to buyers. The prices that are negotiated will determine each trader's earnings in ECUs.
5. In the following we will first explain how you as a seller can earn money through selling units. Thereafter, we will explain how sales and purchases are arranged on the market.

Screen 20



Ronda

1 de 2

Tiempo restante [seg] 0

Reglas para hacer transacciones:

En cada ronda valen las siguientes reglas para hacer transacciones:

1. Los compradores hacen ofertas de compra y los vendedores hacen ofertas de venta. Una oferta de un comprador consiste en ofrecer un precio al que comprar. Una oferta de un vendedor consiste en ofrecer un precio al que vender.
2. Solamente la oferta de compra más alta y la oferta de venta más baja son los denominados precios pendientes a los que pueden tener lugar las transacciones.
3. El precio de transacción es siempre el precio de la oferta de venta (compra) pendiente. Se produce una transacción si una oferta de compra (venta) pendiente es aceptada por un vendedor (comprador). Para ello hay que seleccionar la oferta pendiente y hacer click en Vender (Comprar).
4. Nuevas ofertas de precios tienen que ser mejoras. Es decir, una nueva oferta de compra (venta) tiene que ser superior (inferior) que el precio de la oferta de compra (venta) pendiente.
5. Si se produce una transacción el mercado se vacía y cualquier precio de oferta de compra o de oferta de venta en el intervalo factible vuelve a ser posible. Observa que los precios de ofertas de compra (de ofertas de venta) tienen que ser iguales o inferiores (superiores) al correspondiente valor del comprador (coste de venta del vendedor).
6. Las unidades del bien se comercian una a una. Es decir, no se pueden ofertar ni comerciar varias unidades a la vez.

A continuación se muestra un ejemplo.

AnteriorContinuar


Rules for making transactions

In each round there are the following rules for making transactions:

1. Buyers make buying offers and sellers make selling offers. A buying offer consists offering a price at which to purchase. A selling offer consists in offering a price at which to sell.
2. Only the highest buying offer and the lowest selling offers are the so-called standing prices at which trades can take place.
3. The transaction price is always the standing buying (selling) price. A transaction takes place if the standing buying (selling) is accepted by a seller (buyer).
4. Newly submitted price offers have to be improvements. That is, a new buying (selling) price has to be higher (lower) than the standing buying (selling) price.
5. If a transaction takes place the market clears and any buying and selling price in the feasible range are possible again. Note, that the prices of the buying offers (selling offers) bid (ask) prices have to be equal or lower (higher) than the corresponding buyer value (seller selling cost).
6. The units of the goods are traded one by one. That is, it is not possible to offer or exchange several units at the same time.

In what follows we show you an example.

Screen 21



Ronda

1 de 2

Tiempo restante [seg] 0

Unidades a vender y costes de los vendedores:
En cada ronda, cada vendedor puede vender hasta 2 unidades, pero es libre de no vender ninguna o de vender sólo una. Por cada unidad vendida durante una ronda un vendedor tiene un coste de vendedor de 10 ECUs. Por una unidad que un vendedor no venda el vendedor no incurre ningún coste para esa unidad.

Ingresos de un vendedor
Los vendedores ganan dinero vendiendo unidades a precios por encima de sus costes de vendedor. Estas ganancias se computan restando el coste del vendedor del precio de cada unidad. Por tanto,

$$\text{Ingresos del vendedor de la unidad} = \text{precio de venta} - 10$$

Si un vendedor no vende ninguna unidad en una ronda, este vendedor no gana ningún ECU en esa ronda.

Por cada unidad que un comprador compre el comprador recibe un valor de comprador y puede ganar dinero comprando la unidad a un precio inferior al valor de comprador. En cada ronda, cada comprador puede comprar hasta 2 unidades, pero puede también comprar sólo una unidad o no comprar ninguna. Si un comprador no compra ninguna unidad en una ronda, este comprador no gana ningún ECU en esa ronda.

Los precios a los que vendedores y compradores pueden comerciar son todos los números enteros entre 10 y 95. Es decir, los precios a los que está permitido comerciar son 10, 11, 12, 13, 14,...92, 93, 94, 95.

6. Cada ronda durará un máximo de 3 minutos. Las unidades que al final de los 3 minutos no se hayan intercambiado se pierden, es decir, no pasan a la ronda siguiente.

7. Los valores de los compradores y los costes de los vendedores son información privada y no serán revelados ni durante ni después del experimento.

Anterior

Continuar

Units to sell and seller costs:

In each round, each seller can sell at most 2 units, but is free to sell no units or only one unit. For each unit sold during a round a seller incurs costs of 10 ECUs. For a unit a seller does not sell the seller does not incur the costs for that unit.

Seller earnings:

Sellers make profits by selling units at prices that are above their costs. These profits are computed by subtracting each unit's costs from its selling price. Therefore,

$$\text{seller's earnings per unit} = \text{selling price for unit} - 10.$$

If a seller does not sell any unit in a round, this seller does not earn any ECU's in this round.

For each unit a buyer purchases, the buyer receives a buyer value and can earn money by purchasing the unit at a price lower than the buyer value. In each round, each buyer can purchase at most 2 units, but may also purchase no units or only one unit. If a buyer does not purchase any unit in a round, this buyer does not earn any ECU's in this round.


The prices at which sellers and buyers are allowed to trade are all inter numbers between 10 and 95. That is the permitted trading prices are {10, 11, 12, 13, 14, ... , 92, 93, 94, 95}.

6. Each round will last for a maximum of 3 minutes. The units that at the end of the 3 minutes have not been sold are lost, that is, they are not carried over to the next round.

7. Buyer values and seller costs are private information and will not be revealed neither during nor after the experiment.

Screen 22

This is the screen a buyer faces when making and accepting offers in a round, which is explained on the next screen.



Ronda

1 de 2


Tiempo restante [seg] 0

Vendedor		Unidades del bien que puedes vender		Unidades del bien ya vendidas	
		1		1	
	Ofertas de venta	Precios de Transacción	Ofertas de Compra		
	15	16	45		
	12	23	50		
Haz aquí tu Oferta de Venta.				Para aceptar una oferta de compra haz click en la de mayor precio y después en el botón Vender.	
<div>12</div>					
Oferta de Venta			Vender		

Pulsa a Continuar para ver la explicación.

AnteriorContinuar

Screen 23



Ronda

1 de 2

Tiempo restante [seg] 0

Esta es una pantalla de ejemplo de un vendedor en un mercado en el que se han realizado dos ofertas de venta (columna izquierda), dos transacciones (columna central) y dos ofertas de compra (columna derecha).

En la fila superior, se muestra como este vendedor ya ha vendido una unidad del bien, y por tanto le queda aún otra unidad del bien que puede vender.

Ofertas de venta

Otro vendedor realizó previamente una oferta de venta de 15. Posteriormente el vendedor ha realizado una oferta de venta 12 (resaltada en azul). El precio pendiente es el de menor precio, en este caso 12.

Precios transacción

Este vendedor ya ha realizado una transacción (Venta) por un valor de 23 ECUs (valor resaltado en azul). Otros participantes de tu mercado han realizado una transacción por el valor de 16 ECUs.

Ofertas de compra

Un comprador ha realizado una oferta de compra de 45 ECUs. Posteriormente otro comprador ha realizado una oferta de 50 ECUs. El precio pendiente es 50.

AnteriorContinuar

This is an example screen of a seller in a market in which two selling offers (left column), two transactions (central column) and two buying offers (right column) have been made.

In the top row, it is shown that this seller has already purchased one unit of the good, and therefore he still can sell one other unit.

Selling offers

Another seller has made a selling offer of 15. After this seller has made a selling offer of 12 (highlighted in blue). The standing price is the lower price, in this case 12.

Transaction prices


This seller has already made one transaction (sale) for a value of 23 ECUs (value shown in blue). Other participants of your market have made a transaction for a value of 16 ECUs.

Buying offers

Another buyer has made a buying offer of 45 ECUs. After that another buyer has made an offer of 50 ECUs. The standing price is 50.

Screen 24

This screen is the same than screen 22, but with the highlighted items mentioned on screen 23.



Ronda

1 de 2

Tiempo restante [seg]

0


<div>Vendedor</div>	<div>Unidades del bien que puedes vender</div> <div>2</div>	<div>Unidades del bien ya vendidas</div> <div>0</div>
<div>Haz aquí tu Oferta de Venta.</div> <div></div> <div>Oferta de Venta</div>	<div>Ofertas de venta</div> <div></div>	<div>Precios de Transacción</div> <div></div>
		<div>Ofertas de Compra</div> <div>45</div> <div>50</div> <div>↑</div> <div>Para aceptar el precio de la oferta de compra pendiente, selecciónala con el ratón y pulsa Vender</div> <div>Vender</div>
		<div>Para <u>aceptar</u> una oferta de compra haz click en la de <u>mayor precio</u> y después en el botón <u>Vender</u>.</div>

Esta pantalla te recuerda como aceptar la oferta de compra pendiente.

Anterior

Continuar

Screen 25



Ronda

1 de 2


Tiempo restante [seg] 0

Este es el final de las instrucciones para el mercado en el que actuarás como comerciante. Este mercado durará 18 rondas. Después de 18 rondas participarás durante otras 6 rondas (las rondas 19 a 24) en otra situación de toma de decisiones. Esto se explicará a continuación.

AnteriorContinuar

This is the end of the instructions for the market where you will act as a trader. This market will last for 18 rounds. After 18 rounds you will participate for another 6 rounds (rounds 19 to 24) in another decision making situation. This will be explained below.

Screen 26



Ronda

1 de 1

Tiempo restante [seg] 0

7. En cada uno de las rondas después del mercado, estarás emparejado con otro participante. Este participante será el mismo durante las 6 rondas. Serás emparejado con **otro comprador de otro mercado con el que no has interactuado en el mercado.**

8. En cada ronda, cada participante recibe una asignación de 50 ECUs. En cada ronda la decisión a tomar es cuánto asignar a un fondo A y cuánto a un fondo B. En cada ronda, tendrás que decidir cuantos ECUs depositar en el fondo B y el resto será asignado automáticamente al fondo A.

9. Por cada ECU que asignes al fondo A tus ingresos aumentarán en 1 ECU.

10. Por cada ECU que asignes al Fondo B tus ingresos aumentarán en 0.9 ECUs, y también aumentarán en 0.9 ECUs los ingresos de la persona con la que estés emparejado. Por tanto, cada ECU asignado al Fondo B aumenta los ingresos conjuntos tuyos y de la otra persona en 1,8 ECUs. Esto también se cumple para cada ECU que la otra persona asigne al fondo B. Por tanto, observa que tus ingresos del fondo B así como tus ingresos totales dependen de tu asignación al fondo B y de la asignación al fondo B de la persona con la que estés emparejado.

11. En resumen, tus ingresos totales en una ronda se determinan de la forma siguiente:

Ing. individual =	Ing. Fondo A 50 ECUs - mi asignación al F° B	+	Ing. Fondo B (0.9 x F° B mio) + (0.9 x F° B del otro)
-------------------	---	---	--

Observa que los ingresos de la otra persona se calculan de forma equivalente.

12. Al final de cada ronda se te informará de la cantidad que haya asignado al fondo B la persona con la que estás emparejado. Además, recibirás información acerca de tus ingresos y los de la otra persona en cada ronda. Esta información relativa a las asignaciones e ingresos de todas las rondas pasadas aparecerá en la pantalla de tu ordenador.

Anterior

Continuar

7. In each of the rounds that follow the market, you are paired with one other participants. This other participant will be the same throughout these 6 rounds. You will be paired with **another buyer [in seller-seller pairs: “another seller”] from another market with whom you have not interacted in the market [in Market-Partners: “another buyer [in seller-seller pairs: “another seller”] with whom you have also interacted in the market.”]**.

[In OSDG-MS (OSDG-MP) this item read: “In each of the rounds that follow, you are paired with one other participants. This other participant will be the same throughout these 6 rounds. You have been assigned initial earnings of 2656~ECU (2672~ECU). The other group member is also assigned some initial earnings. The assignments to you and the other group member are not necessarily the same. You and the other group member will receive this amount independently of what occurs during the experiment.”]

[In OSDG-MS (OSDG-MP) with lump-sum income transparency this item read: “In each of the rounds that follow, you are paired with one other participants. This other participant will be the same throughout these 6 rounds. You have been assigned initial earnings of 2656~ECU (2672~ECU). The other group member is assigned initial earnings of 346~ECU (340~ECU). [in high-pay pairs: “The other group member is assigned initial earnings of 2656~ECU (2672~ECU).”] You and the other group member will receive this amount independently of what occurs during the experiment.”]

8. In each round, each participant receives an endowment of 50 ECUs. In each round the decision to be made is to choose how much you allocate to a Fund A and to a Fund B. In each round, you will have to decide how many ECUs to deposit in fund B and the rest will be allocated to fund A automatically.

9. For each ECU that you allocate to fund A your earnings will increase by 1 ECU.

10. For each ECU that you allocate to fund B, your earnings will increase by 0.9 ECUs, and also the earnings of the other person you are paired with will increase by 0.9 ECUs. Hence, each ECU allocated to fund B increases your and the other's earnings together with 1.8 ECU. This also holds for each ECU the other person allocates to fund B. Hence, note that your earnings from fund B as well as your total earnings, depend on your allocation to fund B and on the allocation to fund B of the person you are paired with.

11. In summary, your total earning in one round are determined in the following way:

$$\begin{aligned} \text{Individual earnings} = & \text{Earnings fund A} + \text{Earnings fund B} \\ & 50 \text{ ECU} - \text{my allocation to fund B} + (0.9 \times \text{my allocation to fund B}) + \\ & (0.9 \times \text{other person's allocation to fund B}) \end{aligned}$$

Note, that the earnings of the other person are calculated in an equivalent way.

12. At the end of each round, you will be informed of the allocation to fund B of the person you are paired with. Moreover, you will receive information on your and the other person's earnings in each round. This information regarding the allocation and earnings of all previous rounds will appear on your computer screen.

Screen 27

Ronda

1 de 2

Tiempo restante [seg] 0

Por favor, contesta las preguntas siguientes. El experimento sólo continuará después de que todos los participantes hayan contestado correctamente a todas las preguntas.

1. Esta parte del experimento ¿cuántas rondas tiene en total?
2. Primero comerciarás bienes en un mercado. ¿Durante cuántas rondas funcionará el mercado?
3. En el mercado hay vendedores y compradores. Tú eres vendedor. En total, ¿cuántos vendedores y compradores habrá en el mercado?

vendedores

 compradores
4. En cada ronda los vendedores pueden vender unidades y los compradores pueden comprar unidades.

¿Cuántas unidades puede como máximo vender cada vendedor?

¿Cuántas unidades puede como máximo comprar cada comprador?
5. En cada ronda los participantes que actúan como compradores o vendedores en el mercado son los mismos

☐ SI
☐ NO
6. Como vendedor puedes ganar dinero vendiendo unidades por encima de tu coste de venta. Considera el siguiente ejemplo arbitrario. Por cada unidad que vendas tu coste de venta es 10 ECUs. En una cierta ronda vendes una unidad a 34 ECUs y otra unidad a 76 ECUs. ¿Cuáles son tus ingresos totales en la ronda?
7. Como vendedor puedes ganar dinero vendiendo unidades por encima de tu coste de venta. Considera el siguiente ejemplo arbitrario. Por cada unidad que vendas tu coste de venta es 10 ECUs. En una cierta ronda no vendes ninguna unidad. ¿Cuáles son tus ingresos totales en la ronda?

Anterior

Continuar

Please answer the following questions. The experiment will proceed only after all participants have correctly answered all questions.

1. This part of the experiment has in total how many rounds.

Answer: XXX rounds

2. First you will trade goods on a market. For how many rounds will the market be open?

Answer: XXX rounds

3. In the market there are sellers and buyers. You are a buyer. In total, how many sellers and buyers will be active on the market?

Answer: XXX sellers, XXX buyers

4. In each round sellers can sell units and buyers can buy units. How many units can each seller sell at most and each buyer buy at most?

Answer: X units

5. In each round the same participants will be active as buyers and sellers on the market?

Answer: YES NO


6. As a buyer you can earn money by buying units at prices below your buyer value. Consider the following arbitrary example. For each unit you buy your buyer value is 85 ECU. In a given round, you buy one unit at a price of 34 ECU and another unit at a price of 76 ECU. What are your total earnings in that round?

Answer: XX ECU

7. As a buyer you can earn money by buying units at prices below your buyer value. Consider the following arbitrary example. For each unit you buy your buyer value is 85 ECU. In a given round, you do not buy any unit. What are your total earnings in that round?

Answer: XX ECU

Screen 28



Ronda
1 de 2

Tiempo restante [seg] 0

8. Después de 18 rondas termina la interacción de mercado y serás emparejado con otro participante para otra situación de toma de decisiones, donde tú y el otro participante tendréis que asignar 50 ECUs al fondo A y al fondo B en cada ronda. ¿Cuántas rondas durará esta otra situación de toma de decisiones?

9. En todas las rondas de esta otra situación de toma de decisiones ¿estarás emparejado con el mismo participante?

10. En cada ronda estarás emparejado con:

☐ SI
☐ NO

☐ un vendedor con el que has interactuado en el mercado
☐ un vendedor con el que NO has interactuado en el mercado
☐ un comprador con el que has interactuado en el mercado
☐ un comprador con el que NO has interactuado en el mercado

Marcar la respuesta correcta

11. En esta otra situación de toma de decisiones, considera la siguiente situación arbitraria en una ronda: Tu asignación al fondo B es de 50 ECUs, la asignación y la asignación al fondo B de la persona con la que estás emparejada es de 50 ECUs. En esta situación

Tu ingresos serían

Los ingresos de la persona con la que estás emparejada serían

12. En esta otra situación de toma de decisiones, considera la siguiente situación arbitraria en una ronda: Tu asignación al fondo B es de 0 ECUs, la asignación y la asignación al fondo B de la persona con la que estás emparejada es de 0 ECUs. En esta situación

Tu ingresos serían

Los ingresos de la persona con la que estás emparejada serían

13. En esta otra situación de toma de decisiones, considera la siguiente situación arbitraria en una ronda: Tu asignación al fondo B es de 15 ECUs, la asignación y la asignación al fondo B de la persona con la que estás emparejada es de 35 ECUs. En esta situación

Tu ingresos serían

Los ingresos de la persona con la que estás emparejada serían

8. After 18 rounds the market interaction is over and you will be paired with one other participant for another decision making situation, where you and the other participant will have to allocate 50 ECU to fund A and fund B in each round. How many rounds will this other decision making situation last?

Answer: XX rounds

9. In all 6 rounds of this other decision making situation you are paired with the same other participant?

Answer: YES NO

10. In each round you are paired with:

- ☐ a seller you have interacted with in the market
☐ a seller you have NOT interacted with in the market
☐ a buyer you have interacted with in the market
☐ a buyer you have NOT interacted with in the market

(check the correct answer)

11. In this other decision making situation, Consider the following arbitrary situation in a round:
Your allocation to the fund B is 50 ECU, the allocation to fund B of the person you are

paired with is 50 ECU.

In this situation

your earnings would be:

the earnings of the person you are paired with would be:

12. In this other decision making situation. Consider the following arbitrary situation in a round:

Your allocation to the fund B is 0 ECU, the allocation to fund B of the person you are paired with is 0 ECU.

In this situation

your earnings would be:

the earnings of the person you are paired with would be:

13. In this other decision making situation. Consider the following arbitrary situation in a round:

Your allocation to the fund B is 12 ECU, the allocation to fund B of the person you are paired with is 34 ECU.


In this situation

your earnings would be:

the earnings of the person you are paired with would be:


SELLERS AND BUYERS

(These screens are the ones the participants see during the experiment).

	Ronda 1 de 2		Tiempo restante [seg] 177		
	Vendedor		Unidades del bien que puedes vender 2		Unidades del bien ya vendidas 0
Haz aquí tu Oferta de Venta.	Ofertas de venta	Precios de Transacción	Ofertas de Compra	Para <u>aceptar</u> una oferta de compra haz click en la de <u>mayor precio</u> y después en el botón <u>Vender</u> .	
<input type="text"/>					
<input type="button" value="Oferta de Venta"/>			<input type="button" value="Vender"/>		


Screen 29

This screen shows the transaction screen of a seller at the beginning of a round.

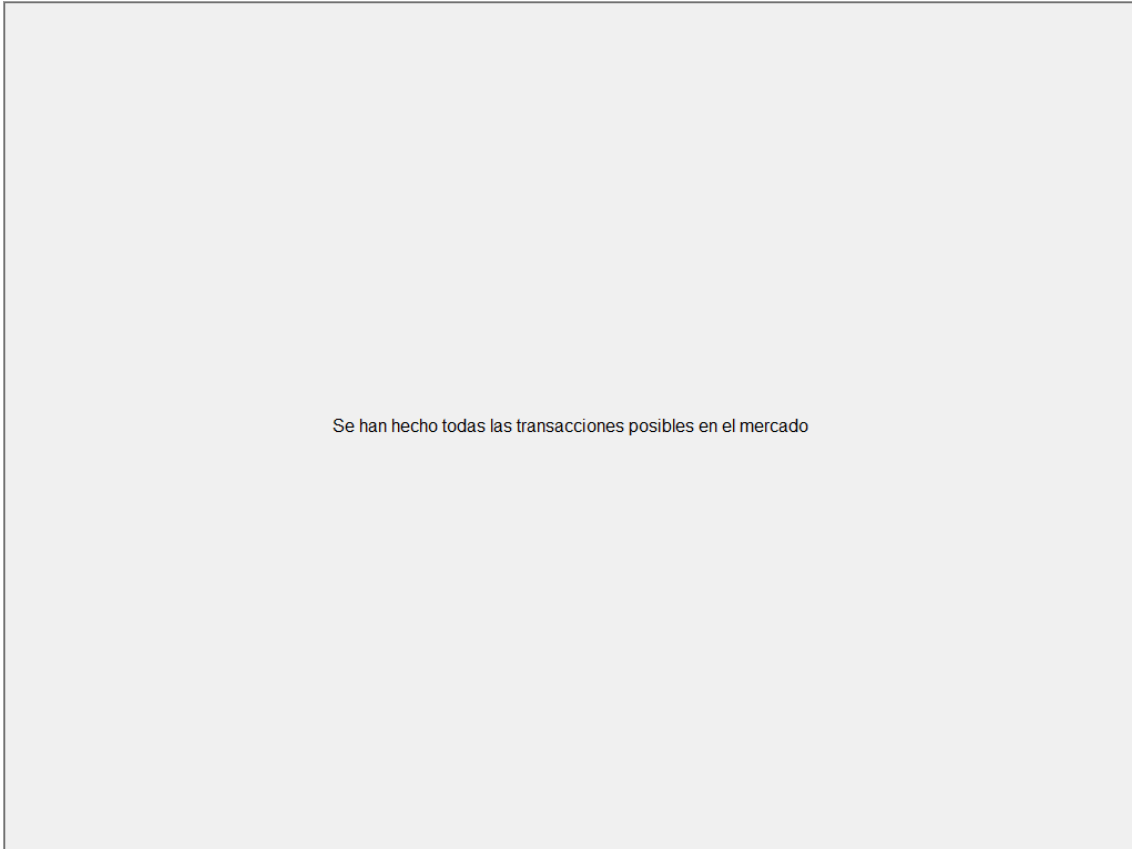
		Ronda		1 de 2		Tiempo restante [seg] 177	
Vendedor			Unidades del bien que puedes vender 2		Unidades del bien ya vendidas 0		
Haz aquí tu Oferta de Venta		Ofertas de venta		Precios de Transacción		Ofertas de Compra	
<div></div>						Para <u>aceptar</u> una oferta de compra haz click en la de <u>mayor precio</u> y después en el botón <u>Vender</u>	
Oferta de Venta						Vender	

Screen 30

This screen shows the transaction screen of a buyer at the beginning of a round.

	Ronda 1 de 2		Tiempo restante [seg] 143	
Comprador		Unidades del bien que puedes comprar 2		Unidades del bien ya compradas 0
Para <u>aceptar</u> una oferta de venta haz click en la de <u>menor precio</u> y después en el botón <u>Comprar</u> .	Ofertas de venta	Precios de Transacción	Ofertas de Compra	Haz aquí <u>tu Oferta de Compra</u> . <div></div>
	<div>Comprar</div>			


Screen 31



Se han hecho todas las transacciones posibles en el mercado

All the possible market transactions have been made.

Screen 32



Ronda

1 de 2


Tiempo restante [seg] 2

El tiempo de ronda de mercado ha finalizado

Continuar

The time of the market round is over.

Screen 33



Ronda

1 de 2

Unidades compradas: 1

Ingreso en esta ronda: 90.0

Ingreso acumulado: 90.0

Nº de la Unidad	Precio
1	10.0

Continuar

Purchased units: 1

Earnings in this round: 90

Accumulated earnings: 90


Number of unit: 1, Price: 10

Screen 34

Esta ha sido la última ronda del Mercado. Ahora participarás durante otras 6 rondas (rondas 19 a 24) en la otra situación de toma de decisiones mencionada en las instrucciones.

This has been the last market round. Now you will participate for another 6 rounds (rounds 19 to 24) in the other decision making situation mentioned in the instructions.

Screen 35



Ronda


1 de 2

Parte 4 : Asignación a fondos

Continuar

Part 4: Allocation to funds

Screen 36



Ronda

1 de 1

Recuerda que ahora participarás durante otras 6 rondas (rondas 19 a 24) en la otra situación de toma de decisiones mencionada en las instrucciones. Este es un breve recordatorio de cómo funcionan estas rondas.

1. En cada una de las 6 rondas siguientes estarás emparejado con **la misma persona, que ha sido comprador de otro mercado con el que no has interactuado en el mercado.**
2. En cada ronda, tú y la otra persona tenéis cada uno una dotación de 50 ECUs, que tendrás que asignar entre el fondo A y el fondo B.
3. Por cada ECU que asignes al fondo A tus ingresos aumentarán en 1 ECU. Por cada ECU que asignes al fondo B, tus ingresos y los de la otra persona aumentarán en 0,9 ECUs.

En resumen, tus ingresos totales en una ronda se determinan de la forma siguiente:

$$\text{Ing. individual} = \text{Ing. Fondo A} + \text{Ing. Fondo B}$$

Observa que los ingresos de la otra persona se calculan de forma equivalente

Continuar

Remember that you will now participate during 6 rounds (rounds 19 to 24) in the other decision making situation mentioned in the introduction. This is a brief reminder of these rounds work.

1. In each of the 6 rounds, you are paired with **the same person, who has been a buyer** [*in seller-seller and buyer-seller pairs: “a seller”*] **of the other market with whom you have not interacted in the market.** [*in Market-Partners: “same market with whom you have interacted in the market.”*]

2. In each round, you and the other person receive an endowment of 50 ECUs, which you will have to allocate between the fund A and the fund B.


3. For each ECU that you allocate to fund A your earnings will increase by 1 ECU. For each ECU that you allocate to fund B, your earnings and the earnings of the other person will increase by 0.9 ECUs.

In summary, your total earnings in a round are determined in the following way:

$$\text{Individual earnings} = \text{Earnings from fund A} + \text{Earnings from fund B}$$

Observe that the earnings of the other person are calculated in an equivalent way

Screen 37



Ronda 1 de 2

Tu asignación al Fondo B:


Recuerda que el valor máximo que puedes introducir es 50

OK

Your assignment to Fund B: _____

Remember that the maximum value that you can introduce is 50.

Screen 38



Ronda

1 de 2

Pantalla Resultados

Periodo	Mi asignación	Asignación del otro	Mi ingreso	Ingreso del otro
1	10	40	85.0	55.0

OK


Results screen

Round	My allocation	Allocation of the other	My earnings	Earnings of the other
1	10	40	85.0	55.0

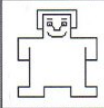


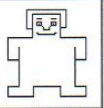
Parte 5

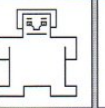
Continuar

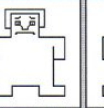



Por favor indica con la ayuda de la imagen como te sientes en este momento.

















 1


 2


 3


 4

 5

 6

 7

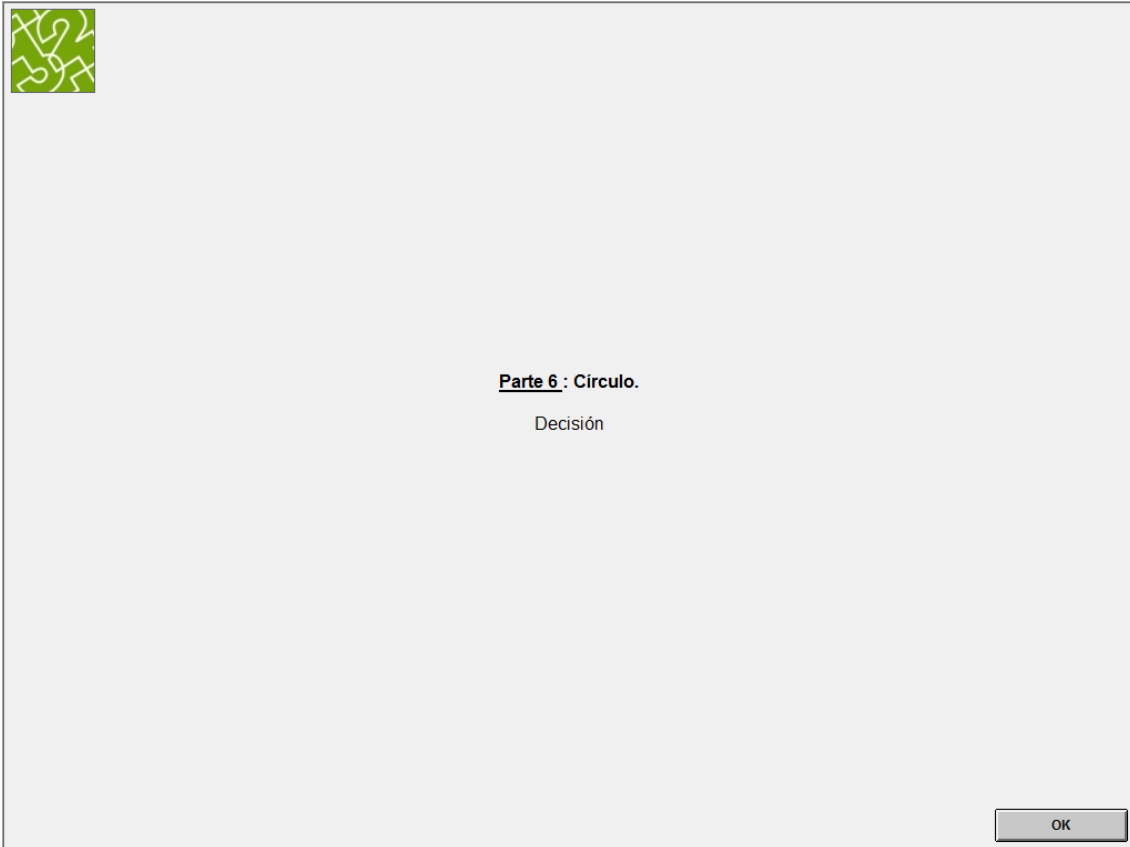
 8

 9

OK

Please indicate with the help of the image how you feel at this moment.

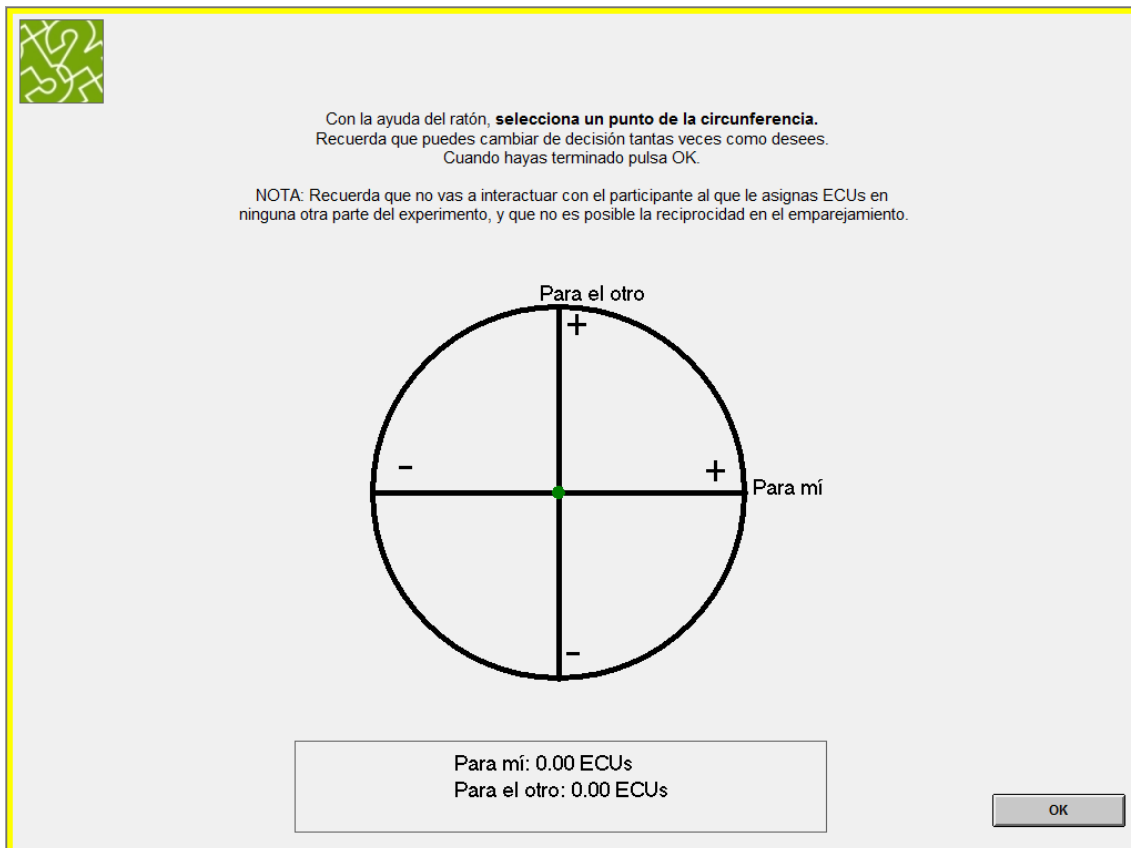
Screen 41



Part 6: Circle

Decision

Screen 42




With the help of the mouse select a point on the circle. Remember that you can change your decision as many times as you wish.

When you are finished press OK.

NOTE: Remember that you will not interact with the participant to whom you assign ECUs in no other part of the experiment and that reciprocity in the matching.

Screen 43



Ronda


1 de 2

Parte 7: Asignación a fondos

Continuar

Part 7: Allocation to funds

Screen 44



Ronda

1 de 2

Instrucciones


Esta parte consta de 12 rondas. En estas 12 rondas estás en la misma situación de toma de decisiones como en la que acabas de estar durante 6 ronda. Estás emparejado con la misma persona que antes.

Continuar

Instructions

This part consists of 12 rounds. In these 12 rounds you are in the same decision making situation as in the one that you have just been during 6 rounds. You are paired with the same person as before.

Screen 45



Ronda

1 de 2

Tu asignación al Fondo B:


Recuerda que el valor máximo que puedes introducir es 50

OK

Your assignment to Fund B:_____

Remember that the maximum value that you can introduce is 50.

Screen 46



Ronda

1 de 2


Pantalla Resultados

Periodo	Mi asignación	Asignación del otro	Mi ingreso	Ingreso del otro
1	-1	-1	49.2	49.2

OK

Round	My allocation	Allocation of the other	My earnings	Earnings of the other
1	0	0	50.0	50.0

Screen 47



Resultados Finales

Parte 2: Círculo 1	Has seleccionado: 0.00 ECUs Tu pareja ha seleccionado para ti: 0.00 ECUs
Parte 3: Mercado	198.00 ECUs
Parte 4: Asignaciones a fondos	98.40 ECUs
Parte 6: Círculo 2	Has seleccionado: 0.00 ECUs Tu pareja ha seleccionado para ti: 0.00 ECUs
Parte 7: Asignaciones a fondos	98.40 ECUs

Total : 394.8 ECUs

[Continuar](#)

Final Results

Part 2: Circle 1 You have selected 0.00 ECUS. Your partner has selected for you: 0.00 ECUS

Part 3: Market 198.00 ECUs

Part 4: Allocation to funds 98.40 ECUs

Part 6: Circle 2 You have selected 0.00 ECUS. Your partner has selected for you: 0.00 ECUS

Part 7: Allocation to funds 98.40 ECUs

Total: 394.8 ECUs

Screen 48

Introduce tus datos personales, por favor.

Género

☐

masculino

☐

femenino

¿Qué edad tienes?

Nacionalidad

¿Qué titulación estudias?

¿En qué curso estás?

¿Cuántos, de los participantes en el experimento son amigos tuyos?

¿En cuántos experimentos has participado previamente?

¿Fueron claras las instrucciones?

Totalmente en contra

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

Totalmente a favor

continuar

Fill in your personal data, please

Gender: male/female

What is your age?

Nationality

What is your major?

Which year are you in?

How many of the other participants are your friends?

In how many experiments have you already participates

Were the instructions clear on a scale from 1 to 7?