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## The Economic Preferences of Cooperative Managers

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## Preferencias económicas de los gerentes de cooperativas

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### Resumen

La literatura enfocada en las prácticas y comportamientos de gerentes y directivos de empresas y sus efectos sobre la productividad y otros desempeños se ha expandido notablemente en los últimos años. Esta literatura ha estado mayormente concentrada en el análisis de empresas privadas convencionales y organizaciones del sector público. En este sentido, se conoce relativamente menos sobre las preferencias económicas de quienes gestionan cooperativas y otros arreglos organizacionales alternativos. En este estudio, se ofrece una caracterización relativamente exhaustiva del perfil comportamental de gerentes y directivos de cooperativas de trabajadores. Se recolectaron medidas de preferencias en relación a la toma de riesgos, paciencia, reciprocidad, altruismo y confianza para una muestra de 196 gerentes de empresas uruguayas (la mitad de ellos empleados en cooperativas de trabajo) y 92 estudiantes universitarios de primer año. A los efectos de elicitar dichas preferencias, se utilizaron procedimientos y juegos experimentales (*lab-in-the-field experiment*) que involucran la provisión de incentivos monetarios. Dada la duración del experimento, el pago medio recibido por los participantes fue aproximadamente 2.5 veces superior al salario gerencial promedio en el sector privado. Se obtuvieron dos resultados principales: (1) la proporción de gerentes amantes del riesgo es menor en los gerentes cooperativos en comparación a los gerentes de empresas convencionales (2) los gerentes cooperativos exhiben un mayor grado de altruismo que sus pares convencionales. No se encontraron diferencias significativas en términos de decisiones intertemporales, reciprocidad y confianza.

**Palabras claves:** riesgo, preferencia temporal, altruismo, reciprocidad, confianza, experimento de laboratorio en campo, gerentes, cooperativas

**JEL Classification:** C90, D81, J54

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### Abstract

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A growing body of research has been investigating the role of management practices and managerial behaviour in conventional private firms and public sector organizations. However, little is known about managers' behavioural profile in noninvestor-owned firms. This paper aims to fill this gap by providing a comprehensive behavioural characterization of managers employed in cooperatives. We gathered incentive-compatible measures of risk preferences, time preferences, reciprocity, altruism, and trust from 196 Uruguayan managers (half of them employed in worker cooperatives) and 92 first-year undergraduate students. To do this, we conducted a high-stakes lab-in-the-field experiment in which participants played a series of online experimental games and made incentivised decisions. The average payoff in the experiment was approximately 2.5 times higher than the average local managerial wage in the private sector. Our key findings are that (1) the fraction of risk loving subjects is lower among co-op managers compared to conventional managers, and (2) co-op managers appear to be more altruistic than their conventional counterparts. Interestingly, we do not observe significant differences between the two groups across other preference domains, such as impatience, trust, and reciprocity.

Keywords: risk-aversion, time preferences, altruism, reciprocity, trust, lab-in-the-field experiment, managers, cooperatives.

JEL Classification: C90, D81, J54.

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## 1. Introduction

The study of firms and organizations has recently benefited from the development of two important streams of research. Firstly, there has been a major progress in the economic analysis of management. Specifically, a growing body of evidence has documented the effect of management practices on productivity and firm performance (Bloom and Van Reenen, 2007). Secondly, the rapid expansion of behavioural economics has naturally led to the development of an entire new range of applications to problems in economic organization (Camerer and Malmendier, 2007). However, less is known about the underlying economic preferences and behavioural traits of managers.<sup>1</sup> Moreover, while the conventional business firm has captured most scholarly attention in organizational economics, the study of alternative organizational forms, such as cooperatives and not-for-profits, has been largely overlooked (Gibbons and Roberts, 2015). This is an important research gap given the fact that noninvestor-owned firms play a prominent economic role in modern economies (Hansmann, 2012).

In this paper, we provide a comprehensive behavioural characterization of managers employed in worker cooperatives. A worker cooperative (WC), or worker-managed firm, is a firm in which the workforce has ultimate control rights (Dow, 2003). Their members have equal influence on strategic management decisions regardless of their capital contribution to the firm ('one person, one vote'). In practice, these firms are usually employee-owned. Are these organizations managed by individuals characterized by distinct behavioural profiles? To answer this question, we gathered incentive-compatible measures of risk preferences, time preferences, reciprocity, altruism, and trust from 196 Uruguayan managers, half of them employed in WCs and the other half in conventional private-sector firms. We also collected experimental data from a sample of 92 first-year undergraduate students in order to obtain benchmark results from a conventional subject pool. We ran a lab-in-the field experiment in which managers played a series of online experimental games and made incentivised decisions. The study was conducted in Uruguay using oTree, an open-source platform for implementing economic experiments (Chen et al., 2016).

We measure risk aversion and impatience by using a lottery choice and discounting experiments, respectively (Falk et al., 2016). To measure altruism, we rely on a standard Dictator Game. We elicit trust and positive reciprocity as first and second mover behaviour in the Trust Game (Berg et al., 1995). To measure negative reciprocity, we use subjects' minimum acceptable offer in an Ultimatum Game (Güth et al., 1982). According to Gneezy and Imas (2016), a crucial advantage of lab-in-the-field experiments is that they are conducted in a naturalistic environment targeting a theoretically relevant population without losing control of experimental conditions.<sup>2</sup> In other words, this methodology has the potential of combining the benefits of both laboratory and field experiments.

Our main findings are that (1) the fraction of risk loving subjects is lower among co-op managers (10%) compared to conventional managers (21%), and (2) co-op managers appear to be more altruistic than their conventional counterparts, with Dictator game transfers being, on average, 44% of the initial endowment for co-op managers versus 38% for conventional managers. Moreover, co-op managers are significantly more (less) likely to implement the

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<sup>1</sup> A notable exception is the literature on managerial overconfidence (Malmendier and Tate, 2005, 2009).

<sup>2</sup> A lab-in-the-field experiment can be assimilated to an "artefactual field experiment" in the spirit of Harrison and List (2004), i.e. a conventional lab experiment but with a nonstandard subject pool.

perfectly egalitarian (selfish) allocation than conventional managers. Both findings are robust to controlling for a set of manager and firms' characteristics. Interestingly, we do not observe significant differences between the two groups across other preference domains, such as impatience, trust, and reciprocity. In all cases, subjects' responses fall in a similar range compared with conventional lab experiments, thus validating the use of online experiments for measuring economic preferences in nonstandard subject pools.

The paper makes four distinct contributions. Firstly, the study adds to the literature on CEO behaviour and personality traits (Bertrand and Schoar, 2003; Kaplan and Sørensen, 2016; Mullins and Schoar, 2016; Bandiera et al., 2017).<sup>3</sup> In a study similar to ours, Fehr and List (2004) compare the trusting behaviour of CEOs and students. Koudstaal et al. (2016) conduct a lab-in-the-field experiment comparing entrepreneurs to managers and employees in terms of risk preferences. Interestingly, the role of managers has been largely overlooked in the theoretical and empirical literature on worker cooperatives. As pointed out early by Atkinson (1973), this omission may be due to the long-standing practice of assuming that worker cooperatives coherently pursue a single objective of maximizing income per worker. This rules out the problem of separation of ownership and control arising in any large (conventional or cooperative) firm operating under the control of appointed managers, rendering the issue of managerial behaviour of only secondary analytical importance. Implicitly, the literature has assumed that members are able to align managerial actions with their interests through the threat of dismissal. In practice, however, managers enjoy substantial discretion and their preferences may affect the performance and organization of cooperative firms. This paper provides a comprehensive characterization of managers' economic preferences, comparing conventional and cooperative firms.

Secondly, our paper speaks to previous research on compensation structure and self-selection into worker cooperatives and communal organizations. Our results on cooperative managers' risk-taking preferences seem consistent with the idea that egalitarian compensation structures, typically found in cooperatives and other communal organizations, may serve as risk-sharing arrangements, discouraging risk-seeking individuals from joining and remaining in these organizations (Abramitzky, 2008, 2011).<sup>4</sup> Interestingly, there is evidence showing that cognitive ability is associated with risk taking behaviour, particularly when it comes to exploiting advantageous situations (Dohmen et al., 2018). Hence, the lower share of risk-seeking managers found in cooperatives may convey additional information about problems of recruitment and retention of managerial talent and the quality of management decisions in these organizations. Moreover, our study provides incentive-compatible measures of the extent of social preferences among cooperative managers. The importance of attracting prosocial individuals for non-profits and social enterprises has been acknowledged in recent theoretical work (Besley and Ghatak, 2017).<sup>5</sup> Ben-Ner and Ellman (2013) also argue that the long-run success of worker

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<sup>3</sup> Liu and Huang (2013) and Sharma and Tarp (2018) investigate the effect of risk preferences on farmers' behaviour. Graham et al. (2013) find a correlation between managerial risk aversion and corporate policies. Riedl and Smeets (2017) find a correlation between investors' social preferences and socially responsible investment decisions.

<sup>4</sup> Burdín (2016) finds that Uruguayan worker cooperatives exhibit a more compressed compensation structure. As a result, high-wage members are more likely to leave worker cooperatives looking for more attractive job opportunities in the conventional business sector. Abramitzky (2008) and Montero (2018) provide additional evidence on egalitarian compensation policies in cooperatives and similar organizations.

<sup>5</sup> In contrast to non-profit firms, a common feature of worker cooperatives and social enterprises is that they do not face a rigid non-distribution constraint.

<sup>6</sup> Sen (1966) is an early attempt to incorporate the role of social preferences ("sympathy") in a theoretical model of cooperative production. Rose-Ackerman (1996) discusses the role of altruistic preferences in the context of non-profit organizations.

cooperatives may depend on their ability to attract and retain the appropriate mix of behavioural types, emphasising the role of social preferences in overcoming labour discipline problems.<sup>7</sup> However, evidence on individuals' prosociality in nonconventional organizational settings is scant. Ruffel and Sosis (2006) find that kibbutz members and non-members exhibit similar levels of cooperation when faced with anonymous outsiders. Hopfensitz and Miquel-Florensa (2017) find that cooperative farmers in Costa Rica do not contribute more than private market farmers to a common fund. We do find that cooperative managers are more altruistic than conventional managers, but we do not find differences in reciprocity and trust.

Moreover, our paper relates to the literature on sorting and person-organizational fit, i.e. consistency between organizational culture and members' values and traits (Van den Steen, 2005; Andersson et al., 2016). Ben-Ner (2013) argues that a mismatch between organization structure and member preferences may reduce performance. Experimental evidence shows that different compensation schemes lead to well-defined patterns of sorting into those schemes. For instance, it has been shown that relatively risk averse workers prefer receiving fixed wages, and prosocial individuals are reluctant to accept contracts involving the use of financial incentives (Dohmen and Falk, 2011; Deserranno, 2019). Interestingly, worker cooperatives exhibit several organizational features (profit-sharing, employment stability, compressed compensation structure, democratic governance) that may affect workers' sorting in different ways. Our findings provide suggestive evidence on a specific pattern of behavioural selection of managers into cooperatives.<sup>8</sup> Our results do not suggest neither a clearly advantageous nor a disadvantageous sorting pattern of individuals into this type of firms.

Finally, the paper adds to the literature on lab-in-the-field experiments and speaks to experimental work comparing students and non-standard subjects, particularly managers and professionals (Fehr and List, 2004; Gneezy and Imas, 2016; Fréchette, 2011; Fréchette, 2016; Batsaikhan, M. and Putterman, L., 2019). In all three of our experiments measuring social preferences, we find that students are less pro-social than both cooperative and conventional managers. This result adds to previous evidence on the relevance of lab-in-the-field experiments as a tool to study the behaviour of theoretically relevant populations.

The paper is organised as follows. Section 2 explains the experimental design. Section 3 presents our five main findings concerning managers' risk preferences, impatience, altruism, negative reciprocity, and trusting behaviour. Section 4 discusses whether differences between cooperative and conventional managers result from self-selection or endogenous preference formation mechanisms. Section 5 concludes and discusses future research steps.

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<sup>7</sup> For instance, the implementation of mutual monitoring, a key mechanism by which worker cooperatives mitigate shirking, would be unfeasible in the presence of just-selfish members (Putterman, 2006; Carpenter et al., 2009).

<sup>8</sup> According to Elster and Moene (1989), the performance of worker cooperatives may be affected by both positive and negative self-selection. Cooperatives operating in an otherwise capitalist market economy may attract "highly motivated and idealistic individuals who are willing to work hard, to suffer the time costs of participation and if necessary to take a wage cut" and/or "unstable individuals, excessive risk-takers, and people lacking pragmatic orientation" (p.16).

## 2. Experimental design and procedures

### 2.1 Practical procedures

We collect experimental measures of risk, time, and social preferences. To do this, the standard procedure is to conduct incentivised experiments in a university computer laboratory using student subjects. Given the unconventional nature of our subject pool (managers), their relatively high opportunity cost of time (e.g. relevant for commuting to the laboratory site), and the complex logistics related to organizing conventional laboratory sessions, we decided to implement an online experiment using Otree (Chen et al., 2016). Otree is an open-source software platform that allows writing and running experiments remotely. Otree use provides a highly flexible solution as managers can participate in the experiment from their own locations at any time by relying on a wide range of devices (desktop computers, tablets, phones).<sup>9</sup>

In total, 288 subjects participated in our study. This included 96 cooperative managers, 100 conventional managers, and 92 students.<sup>10</sup> The sample of cooperative managers is large, accounting for 22% of the population of worker cooperatives registered in 2016. Managers are appointed by worker-members and take care of the daily operation of the company, consulting members when it comes to making strategic decisions (e.g. investments). Uruguayan worker cooperatives usually fill managerial positions by relying on members rather than on hired labor. In small cooperatives and conventional firms, the role of managers and workers' directors (or firm owners) is often indistinguishable. Participation in the experiment was voluntary and subjects were free to quit the experiment at any time. In the invitation letter distributed among participants, we explained the purpose of the study in very general terms ("the objective of this research project is to analyse human behaviour in various situations"). This should mitigate concerns about potential experimenter effects, as participants had no clue about the details of the study.

We recruited students by e-mail through the student list of a first-year undergraduate course at the Business and Economics School of National University of Uruguay (Universidad de la República). An initial e-mail invitation was sent out asking for those interested in participating in the study. Responders were then contacted via e-mail providing them with information about the procedure to participate online, potential earnings, and rules of payment.<sup>11</sup> Managers were contacted by phone and then received an e-mail invitation with information about the experiment's general procedure and expected earnings.<sup>12</sup> To reinforce subjects' credibility about the experiment and its associated payment, we attached a letter signed by the School's Dean.

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<sup>9</sup> Online experiments have grown exponentially in the last decades, particularly since the development of online labour markets such as Mturk. Horton et al. (2011) show that online experiments can quantitatively reproduce behaviour from the physical laboratory. Eckel and Wilson (2006) discuss potential threats to the validity of online experiments. In the context of the present study, the use of online experiments is considered a pragmatic solution to the problem of recruiting subjects with a relatively high opportunity cost of time.

<sup>10</sup> A few manager subjects started the experiment but did not complete all of the experiment's phases or did not provide their bank account information to receive the payment. We do not consider these subjects in any of the paper's results.

<sup>11</sup> We also conducted a pre-test with students to gather information about the duration of the experiment, the functioning of the online platform, and the payment procedure.

<sup>12</sup> The original sample of managers comes from a firm-level survey conducted by members of the research team in 2011.



After accepting to participate in the experiment, subjects received an e-mail with a unique URL to the experiment. These URLs contained a random code so even if participants communicated with one another, the link would not allow them to identify other players. This is particularly important for the Ultimatum and Trust games, which involve sequential strategic interactions. The same experimental protocol was applied to all subjects. Payoffs earned in the incentivized experiments were paid out to subjects by bank transfer in the same week they completed the experiment, except for the time discounting experiment that involved payments after three and six months. Online sessions lasted about 40 minutes and the average payoff was 1,027 Uruguayan pesos (34 US-dollars at the time), including a show up fee of 480 Uruguayan pesos. The stake is 2.5 times higher than the average local managerial wage in the private sector.<sup>13</sup> We conducted the experiment in 2018. The experiments with students extended over a couple of weeks between February and March and the experiments with managers took place between May and November.

In Table 1, we report descriptive statistics on basic socio-demographic characteristics for the three groups of subjects. Co-op and conventional managers are similar in terms of age and education. The fraction of female managers is slightly higher in cooperatives. Students are obviously younger than managers on average.

Table 1. Descriptive statistics

	Cooperative managers	Conventional managers	Students
% Female	0.51	0.40	0.62
Age	45.6 (10.9)	47.2 (11.5)	22.9 (6.5)
% Incomplete secondary school	0.18	0.13	0.00
% Complete secondary school	0.14	0.16	0.04
% Incomplete tertiary education/university	0.21	0.26	0.92
% Complete tertiary education/university	0.47	0.45	0.04
% Small firms	0.69	0.64	-
% Medium firms	0.27	0.22	-
% Large firms	0.04	0.14	-
% Industry	0.21	0.22	-
% Services	0.68	0.62	-
% Transport	0.09	0.12	-
% Others	0.02	0.04	-
Number of observations	96	100	92

## 2.2 Choice experiments

We rely on standard choice experiments designed to elicit risk preferences, impatience, altruism, trust, and positive and negative reciprocity. The experiments' design follow Falk et al. (2016) closely. Monetary stakes were presented in points (100 points = 21 Uruguayan pesos~0.7 US dollars). All experimental games involving strategic interactions were one-shot games in order to avoid repeated game effects. In those games, subjects were told that they were interacting with another (anonymous) subject remotely located, and that they were not going to

<sup>13</sup> We calculate average managerial salary using the last official household survey available (ECH-INE, 2017). The average monthly net-of-tax salary of private sector managers in Uruguay was 106.934 Uruguayan pesos (3565 US-dollars). The corresponding hourly wage was 595 Uruguayan pesos (20 US-dollars).

play with the same partner more than once. In the Dictator, Ultimatum, and Trust games (see below), each subject played the game twice, once in each role.<sup>14</sup>

*2.2.1 Risk preferences.* We elicited risk preferences by using a multiple price list (MPL) in which subjects choose between a lottery and varying safe options (Holt and Laury, 2002; Dohmen et al., 2011; Charness et al., 2013). We presented participants a list of 21 decisions between two options: a safe one (option A) and a risky one with known probabilities (option B). In each row, option B corresponded to earning 1000 points with a 50% chance or zero points with a 50% chance. The safe option A, on the other hand, gradually increased from zero (row 1) to 1,000 points (row 21). After a participant made a decision for each row, we randomly determined which row was relevant for the participant's payoff. Depending on the subject's choice in that row, her payoff would be either the safe option or the outcome of the lottery. This procedure guarantees that each decision is incentive compatible (Dohmen et al., 2011). Our measure of risk is the value of the safe option at the switching row, i.e. the row in which subjects switch from preferring the lottery to the safe payment.<sup>15</sup> Following Holt and Laury (2002), as long as subjects have monotonic preferences, they will prefer the lottery up to a certain level of the safe option, and then switch to preferring the safe option in all subsequent rows of the price list. The value of the safe option at the switching point is usually interpreted as subjects' certainty equivalent. The higher the value of the safe option, the greater is the individual's willingness to take risks. In particular, risk-averse subjects should prefer safe options that are smaller than or equal to 500 points (the expected value of the lottery) over the lottery. Only risk-loving subjects should prefer the lottery when the offered safe payment is greater than 500 points.

*2.2.2 Time discounting.* We elicited time preferences by using a multiple price list, in which subjects choose between a payment today (400 points) and a larger delayed payment in 3 months. The early payment was always 400 points and the delayed payment increased by 10 points in each subsequent row, starting from 430 point in the first row and reaching 660 points in the 24th row. The first-row value implied an inflation-discounted annual return rate of around 24% and the value in the 24th row reached an annual return rate of around 600%. Our experimental measure of impatience is the value of the delayed payment (the implied rate of return) that is necessary to induce the subject to wait 3 months, i.e. the row in which the subject switches from the early payment to the delayed payment.<sup>16</sup> Similar to the procedure used in the domain of risk, after participants made a decision in each row, we randomly determined which row was relevant for the participant's payoff. We also implemented a second multiple price list in which we introduced front-end delay (shift horizon design): subjects choose between an early payment in 3 months and a larger payment in 6 months. The within-subject comparison between the front-end delay and no front-end delay choice sets conveys information on the extent of present-bias or dynamic inconsistency among subjects (Frederick et al., 2002).

*2.2.3 Altruism.* We measured altruism by the share of the endowment (300 points) transferred by dictators in a standard dictator game. In this game, the Dictator decides how to split the endowment between herself and another player, the Recipient (Kahneman et al., 1986; Forsythe

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<sup>14</sup> As our focus is on between-subject comparisons, choice experiments were presented in the same order to all subjects. For a discussion of order effects, see Charness et al. (2013).

<sup>15</sup> The fraction of subjects exhibiting multiple switching points was 17.7%, 15%, and 16.3% in cooperative managers, conventional managers, and students, respectively. We compute the average switching point in those cases.

<sup>16</sup> In this case, the fraction of subjects exhibiting multiple switching points was very similar across groups (8-9%). We also compute the average switching point for these cases. The fraction of subjects having nonunique switch points is similar to previous studies using multiple price lists (Holt and Laury, 2002; Meier and Sprenger, 2014).

et al., 1994). The standard prediction assuming self-regarding dictators is that subjects would share nothing with the Recipient and keep the whole endowment for themselves.

*2.2.4 Trust.* We elicited trust as the first mover behaviour in the Trust Game (Berg et al., 1995). More precisely, we measure trust as the amount sent by the first mover (“trustor”) in this game. In our trust game, a Trustor and Trustee each receive an initial endowment of 250 points. The Trustor can invest all or part of her money by sending any amount  $y \in \{0, 50, 100, 150, 200, 250\}$  to the Trustee. The experimenter then triples the amount sent, so that the Trustee receives  $3y$ . The Trustee then decides to return any amount  $z$  between 0 and  $3y + 250$  to the Trustor. As a result of these decisions, the Trustor and Trustee’s final payoffs are  $250 - y + z$  and  $250 + 3y - z$ , respectively. The standard prediction is that self-regarding trustees will return  $z = 0$ . Anticipating that, a self-regarding trustor should transfer nothing ( $y = 0$ ).

*2.2.5 Reciprocity.* Following Fehr and Gächter (2000), a preference for reciprocity is the desire to punish others seen as harming one (negative reciprocity) and the desire to benefit others seen as benefiting one (positive reciprocity). We measured negative reciprocity with the minimum acceptable offer (MAO) in the Ultimatum game (Güth et al., 1982). In the Ultimatum game, a Proposer makes an offer  $y$  regarding the division of an initial endowment (500 points) between herself and a Responder. The Responder can either accept or reject the offer. In the latter case ( $y < MAO$ ), both players earn zero. If the Responder accepts the offer ( $y \geq MAO$ ), she earns  $y$  and the Proposer earns  $500 - y$ . The higher the MAO, the more subjects are willing to forego their own monetary gain in order to punish unfair offers. The standard prediction for this game is that self-regarding responders will accept any positive offer, and that Proposers will offer the smallest possible positive amount. Finally, we elicit positive reciprocity as the second mover behaviour in the Trust game and measure it as the amount sent back in that game. We rely on the strategy method so participants make conditional decisions for the same discrete set of predetermined proposer’s offers.<sup>17</sup>

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<sup>17</sup>The use of the strategy method is also common in experiments embedded in representative surveys given the logistical problems of implementing sequential games in a one-step procedure (Fehr et al., 2003). According to Brandts and Charness (2011), the strategy method produces qualitatively similar results when compared to the standard direct-response method. However, they find that the levels of punishment are lower with the strategy method.

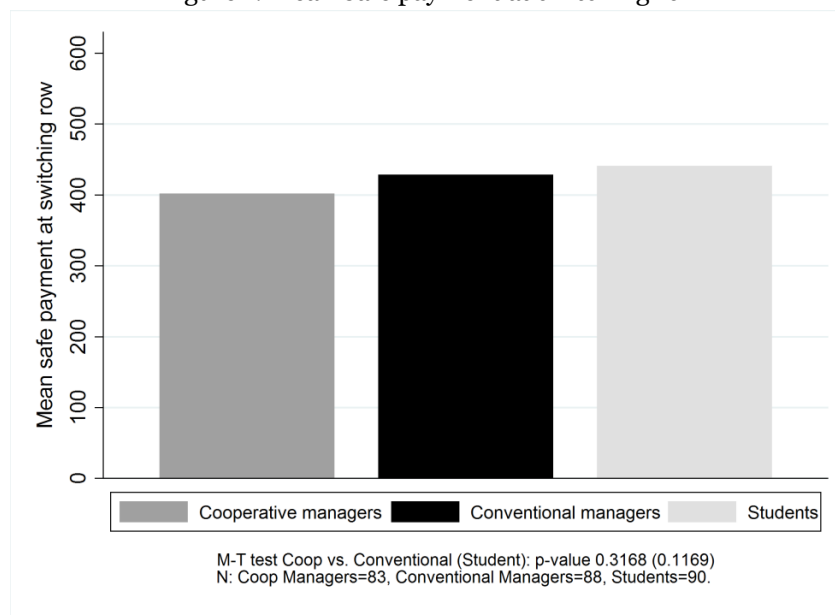
### 3. Results

This section presents our main findings. We are interested in understanding whether cooperative managers exhibit different economic preferences than managers employed in conventional enterprises. For each preference domain, we compare the two subsamples of managers. We also report the results for the student pool in order to have a conventional subject pool as a benchmark.

**RESULT 1.** *There are no differences in the average willingness to take risks between co-op and conventional managers. However, the fraction of risk-loving subjects is significantly lower among co-op managers.*

We measure risk attitudes by looking at the value of the safe option at the switching row for each individual, i.e. the point in which the individual switches from the lottery to the safe payment. The higher a subject's certainty equivalent, the greater her willingness to take risk.

Figure 1. Mean Safe payment at switching row



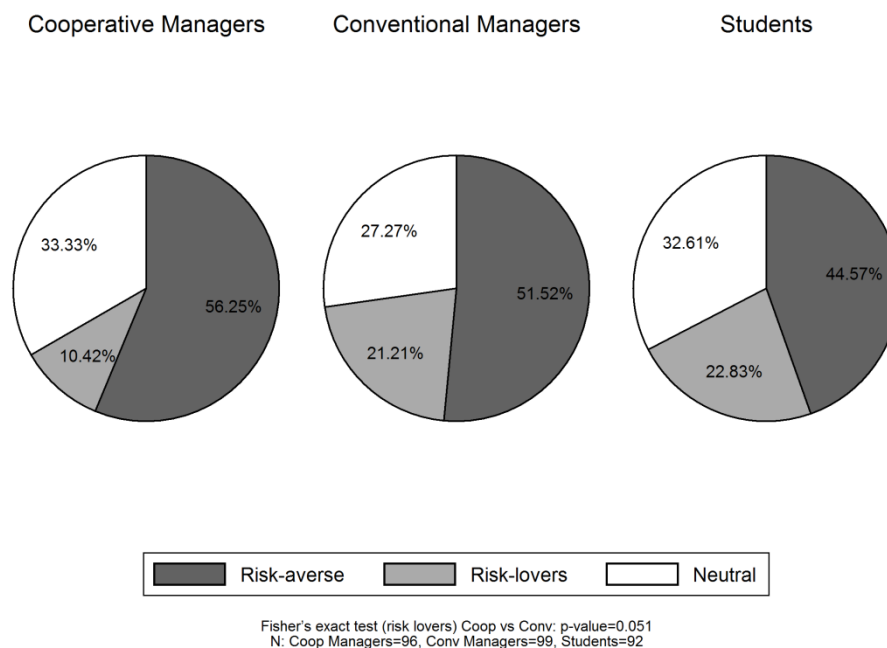
In Figure 1, we plot the mean safe option for each of the three groups. The difference between co-op and conventional managers is not significant according to a Mann-Whitney test (p-value=0.3168).<sup>18</sup> The associated median coefficient of relative risk aversion (CRRA) lies within the interval 0.13-0.24 for cooperative managers and 0-0.13 for conventional managers and students.<sup>19</sup>

<sup>18</sup> We exclude subjects who never switched between the lottery and the safe payment. This share was 14%, 13%, and 2% for cooperative managers, conventional managers, and students, respectively.

<sup>19</sup> We follow the procedure used by Dohmen et al (2018). We assume a CRRA utility function  $u(x) = \frac{x^{1-r}}{1-r}$  where  $x$  denotes wealth or consumption possibilities. The parameter  $r$  describes an individual's degree of relative risk aversion. A higher  $r$  means a higher degree of concavity of the utility function and, hence, higher risk aversion. Indifference between a lottery of winning 1000 points or zero with equal chances ( $p=0.5$ ) and a safe option  $S$  implies  $p \cdot \frac{1000^{1-r}}{1-r} = \frac{S^{1-r}}{1-r}$  and, hence  $r = 1 - \frac{\ln p}{\ln S - \ln 1000}$ . The value of the safe option in the switching row gives the lower bound for the interval containing  $r$  and the safe option in the

As shown in Figure 2, there are some interesting differences in the share of risk-neutral, risk-loving, and risk-averse co-op and conventional managers. Subjects are risk neutral if they prefer the safe option to a lottery with the same expected value (i.e. 500 points) but choose the lottery for smaller values of the safe option; or if they play the lottery when the safe option is 500 points but do not play the lottery when the safe option is greater than the lottery's expected value. Subjects are risk loving (risk-averse) if they prefer (not) to play the lottery when the safe option is larger (smaller) than the lottery's expected value. The share of risk-neutral and risk-averse subjects is not statistically different across groups at conventional values<sup>20</sup> but there is a significant difference of around 10 percentage points between cooperative managers and both conventional managers and students when it comes to the share of risk loving subjects.

Figure 2. Distribution of risk preferences by group



To investigate this difference further, we estimate a series of Probit models in which the dependent variable equals to one if the subject is risk loving and zero otherwise, and the independent variable of interest is a co-op dummy. We further control by gender, age, and education. Results reported in Table A.1 in Appendix reinforce the conclusion of risk-loving subjects being more common among the sample of conventional managers. The status of co-op manager is associated with significant reduction (11 percentage points) in the probability of being a risk-loving subject, even after controlling for individual's characteristics (gender, age, education), firm size, and industry dummies (column 3).<sup>21</sup>

previous row gives the upper bound. The median safe option is 450 points for cooperative managers and 500 points for conventional managers and students. This procedure assumes an initial wealth level of zero (i.e. individuals do not integrate their current wealth when making their choices). Our CRRA coefficients are similar to those obtained in previous studies using a similar subject pool. For instance, Koudstaal et al (2015) found CRRA coefficients of 0–0.21 for entrepreneurs and managers and 0.21–0.37 for employees. For a critique on characterizing risk preferences from small stake lotteries, see Rabin (2000).

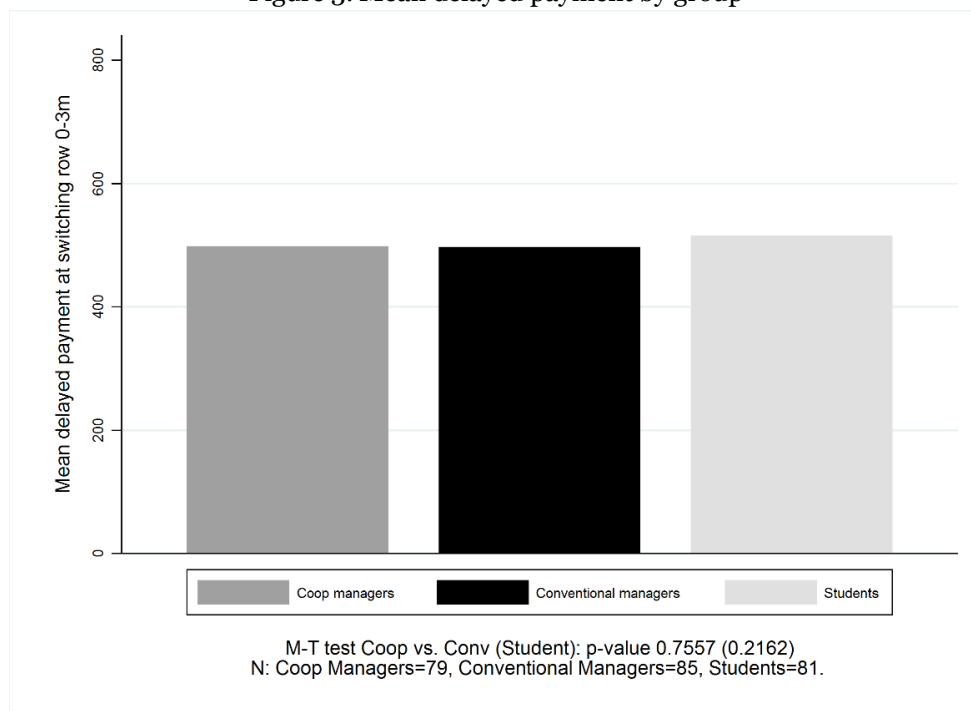
<sup>20</sup> In fact, 500 points is the certainty equivalent's modal value for the three groups, as shown in the histogram of subjects' choices reported in Appendix Figure A.1.

<sup>21</sup> For a small subsample of managers, we were able to match information on managers' household income collected in 2011, i.e. long before the experiment, as part of a previous survey. We estimate regressions adding household income controls for this subsample. We ran additional regressions adding controls for

**RESULT 2.** *There are no differences in the average degree of impatience between co-op and conventional managers. The share of dynamically inconsistent subjects is also similar across groups.*

In the intertemporal choice experiments, subjects made choices between a fixed immediate payment (400 points) and a (larger) payment to be received in 3 months. As explained in section 2, subjects also made intertemporal choices across a 3-6 months' time horizon. As described above, the delayed payment becomes increasingly attractive as we increased its value from 430 points in row 1 to 660 points in row 24. Our experimental measure of impatience is the value of the delayed payment at the row in which subjects switch from the immediate to the delayed payment. The higher the value of the delayed payment required to postpone an immediate reward, the more impatient the subject is.

Figure 3. Mean delayed payment by group



In Figure 3, we display the mean delayed payment for the three groups in the no front-end delay (0-3 months). The difference between co-op and conventional managers is not significant according to a Mann-Whitney test (p-value= 0.7557).<sup>22</sup> It is important to note that this figure does not include subjects who were always impatient, i.e. subjects who always chose the

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time of the day (morning, afternoon, evening) and day of the week at which the subjects completed the experiment (Column 6 of Table OA.3.1 in Online Appendix). The basic results remain unchanged. Finally, we estimate the model excluding subjects who switched multiple times between the lottery and the safe payment. These results are reported in Table OA.3.2 in Online Appendix). Despite a substantial reduction in the number of observations (25-30%), the co-op dummy remains negative but estimates are rather imprecise (p-value= 0.16).

<sup>22</sup> Regression analysis reported in Tables OA.3.3 to OA.3.6 in Online Appendix further confirms that there are no differences between the two types of managers.

immediate payment.<sup>23</sup> The conclusions do not change if we impute extreme values of the delayed payment to these subjects.<sup>24</sup>

In Figure 4, we plot the fraction of patient subjects at each decision row for each group in both intertemporal choice sets (0-3 months and 3-6 months), reinforcing the idea that cooperative managers' time discounting behaviour is similar to the other two groups. As expected, the fraction of subjects choosing to wait is increasing with the amount of the delayed payment for all groups and in both choice sets. This is reassuring considering that subjects' revealed time preferences in the 0-3 months' choice may be confounded with risk aversion and credibility concerns. Individuals may attach greater risk to delayed compensation than to the immediate payment. In the 3-6 months' choice, as both payments are dated in the future, we hold constant any perceived risk attached to future payments (Bettinger and Slonim, 2007; Dohmen et al., 2017).

Finally, we exploit the within-subject comparison of intertemporal choices made under the two time frames to assess the extent of dynamic inconsistent behaviour among cooperative managers. More precisely, we can compute the fraction of subjects who were more, less, or equally patient in the 0-3 months than in the 3-6 months time horizon. We classify subjects as present-biased if they behave more impatiently (i.e. greater delayed payment at switching row) in 0-3 months than in 3-6 months. In other words, present-biased individuals are more impatient in the present than in the future. On the contrary, future-biased subjects behave more impatiently in the 3-6 months than in the 0-3 months choice set.<sup>25</sup> These subjects exhibit increasing impatience (Dohmen et al., 2012). Finally, constant discounters are those who were equally patient in both choice sets, i.e. those whose decisions are insensitive to the time frame.

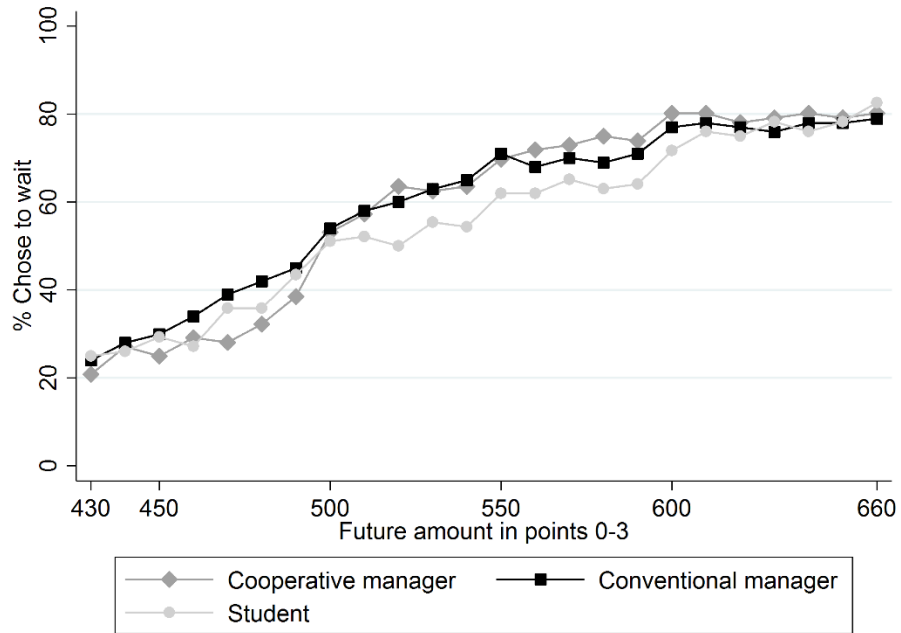
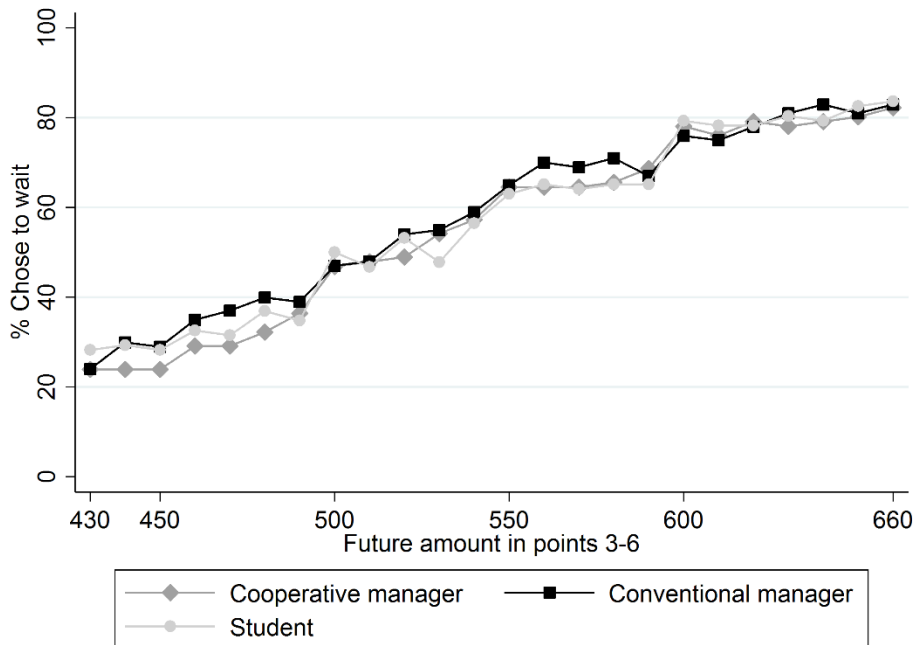
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<sup>23</sup> Figure A.4 in Appendix shows the fraction of always-impatient (Panel A) and always-patient (Panel B) subjects by group under both the no front-end delay (left) and front-end delay condition (right). About 18% of co-op managers and 15% of conventional managers behave in that way in the no front-end delay condition (Fisher's exact test: p-value: 0.7). There are also no statistically significant differences in the share of always-patient subjects.

<sup>24</sup> We apply the following rule to impute extreme values to non-switchers. For non-switchers who are always impatient, we assigned them what would be the following value after the highest postponed value in the list (i.e. 670 points). See Figure A.5 in Appendix.

<sup>25</sup> Previous studies using subjects recruited from local students and staff population have found a slightly higher fraction of present-biased subjects. Using a similar incentivised intertemporal choice experiment, Delaney and Lades (2017) reports 45% of present-biased individuals in their sample.

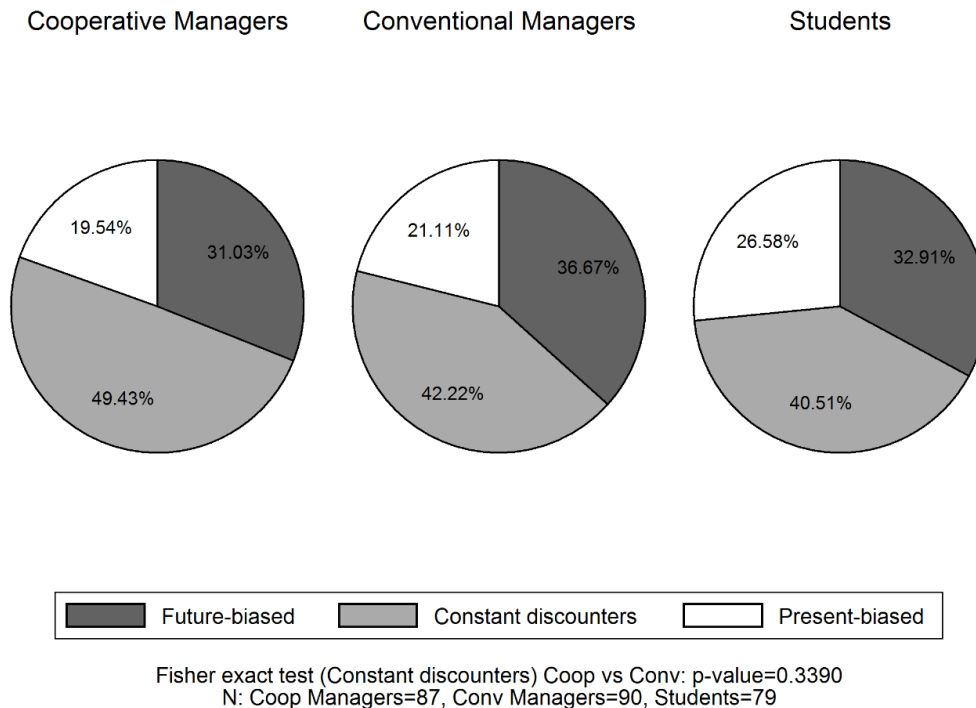
Figure 4. Fraction of patient subjects by group and amount received

*Panel A: No front-end delay (0-3 months)**Panel B Front-end delay (3-6 months)*

We report the composition of the three groups in Figure 5. Approximately half of the cooperative managers made choices consistent with constant discounting. The share of present-biased subjects is similar across groups, ranging from 20 to 27%. None of the differences is statistically significant according to Fisher exact tests.



Figure 5. Time consistency by group

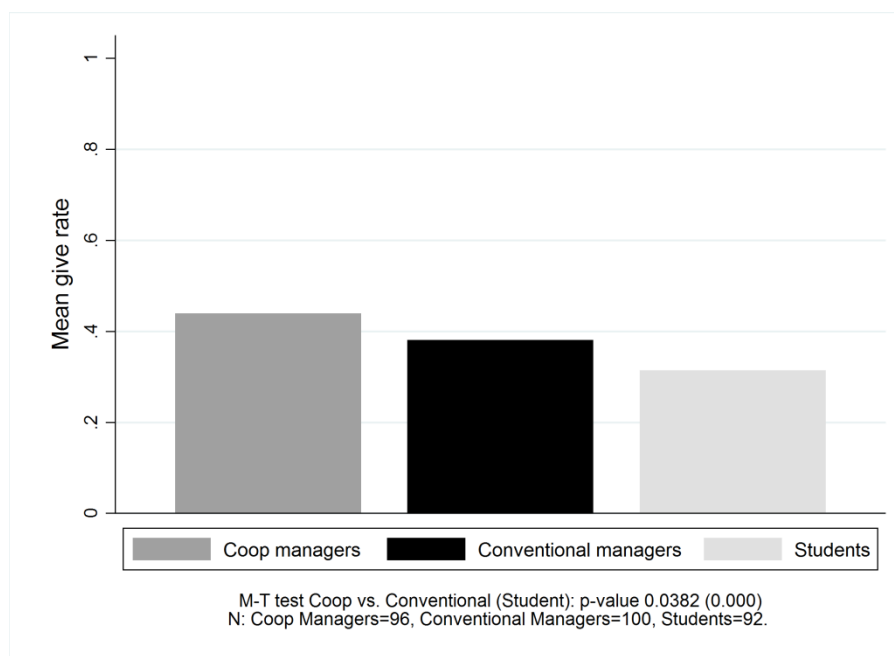


**RESULT 3.** Give rates in the Dictator Game suggest that co-op managers are more altruistic than their conventional counterparts. The fraction of subjects implementing the perfectly egalitarian (selfish) allocation is higher (lower) among cooperative managers.

Our proxy of altruism is the fraction of the endowment transferred to the other subject in a standard dictator game. Figure 6 reports the mean give rate by group. On average, co-op managers transferred 44% of the initial endowment. This compares to a mean give rate of 38% and 31% among conventional managers and students, respectively. Differences in generosity between co-op and conventional managers are statistically significant (Mann-Whitney test: p-value= 0.0382). Students are the least generous group in our experiment, even though their average contribution is in line with previous studies.<sup>26</sup> In Table A.2 in Appendix, we report Tobit model estimates in which we regress the give rate on a coop dummy and controls for managers' age, gender, education, firm size, and industry dummies. Estimates of the coefficient associated to the co-op dummy are consistently positive around seven percentual points but imprecisely estimated.

<sup>26</sup> The average give rate in the meta-analysis conducted by Engel (2011) is 28.3%. Based on two large samples of Amazon Mechanical Turk workers, Brañas-Garza et al. (2018) report an average give rate of 27-31%.

Figure 6. Give rate in Dictator Game by group



In Figure 7, we report the distribution of give rates by group. For managers, in line with previous studies, we find a bimodal distribution with one main mode at giving nothing, and the other one at splitting the endowment equally. On the one hand, about 56% of co-op managers split the endowment equally. This compares to 37% and 27% of conventional managers and students, respectively. On the other hand, the fraction of co-op managers whose behaviour conforms to the standard prediction based on selfish players is 5%. This share raises to 18% (22%) for conventional managers (students). Regression analysis reported in Table A.3 in Appendix further confirms these differences. The fraction of cooperative managers implementing the egalitarian allocation is 20 p.p. higher compared to conventional managers, after controlling for individual and firm-level characteristics (column 3). Consistently, the fraction of purely selfish players is 15 p.p. lower among cooperative managers (column 6).

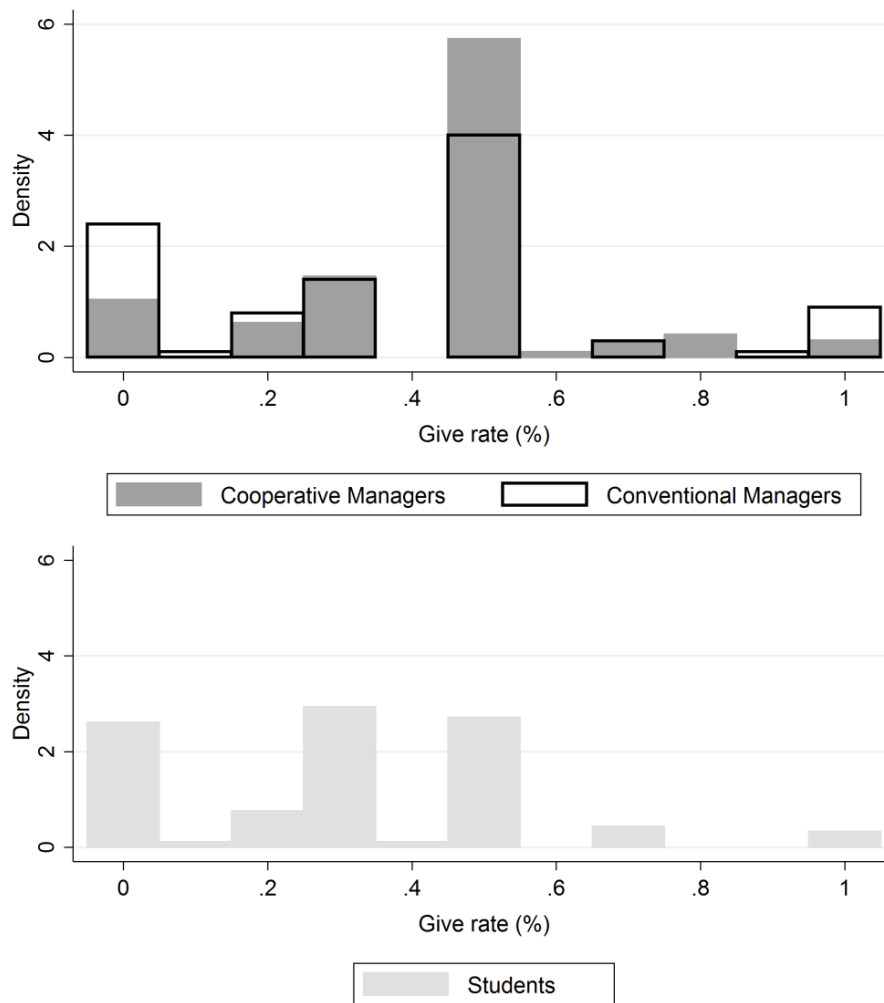
**RESULT 4.** *There are no differences in the fraction of the endowment offered in the Ultimatum Game. Moreover, the comparison of minimum acceptable offers does not reveal significant differences in terms of negative reciprocity.*

In Figure 8, we report the mean offer (Panel A) and the minimum acceptable offer (Panel B) for each group. We find no significant differences in the behaviour of subjects playing as proposers. Co-op managers offered on average 44% of the endowment, while offers by conventional managers and students were 46% and 42%, respectively.<sup>27</sup> This range of average offers is in line with previous studies.<sup>28</sup>

<sup>27</sup> Regression analysis reported in Tables OA.3.7 and OA.3.8 in Online Appendix further confirms that there are no differences in the proposer's offers between the two types of managers.

<sup>28</sup> Oosterbeek et al. (2004) provide a meta-analysis of 37 papers using ultimatum game experiments, reporting an average offer rate of 40% and rejection rate of 16%

Figure 7. Distribution of give rates in Dictator Game by group



N: Coop Managers=96, Conventional Managers=100, Students=92

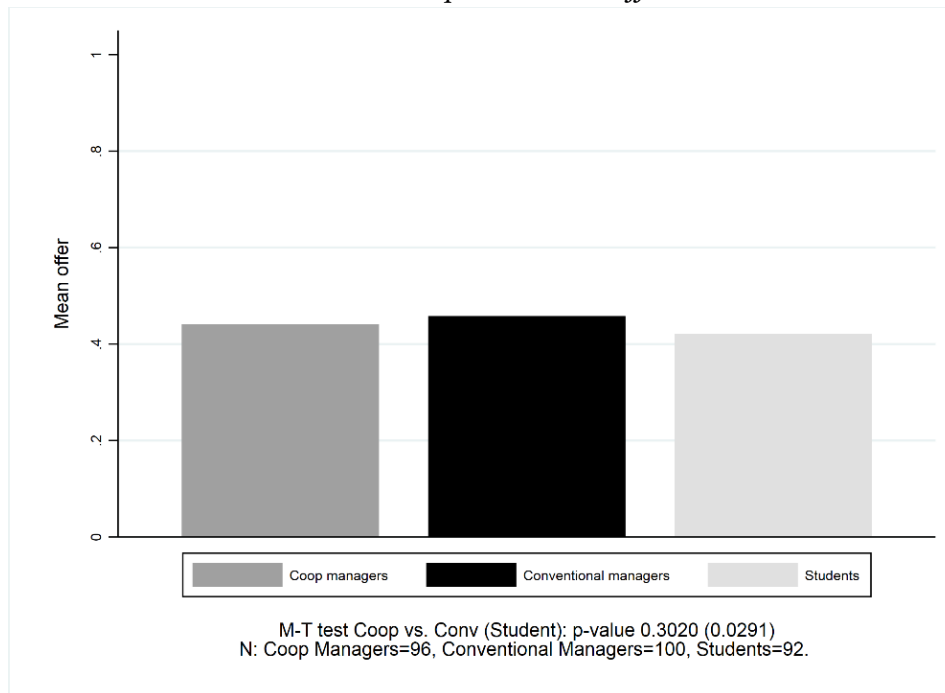
The comparison of the Dictator and Ultimatum Game reveals some suggestive patterns. In relative terms, co-op managers transferred the same amount in the two games. By contrast, the behaviour of the other two groups (conventional managers and students) reacted sharply to the new strategic incentives embedded in the Ultimatum Game, rising their transfers by 8-11 p.p. compared to the Dictator game. In Appendix Figures A.7, we report the cumulative distribution function of the fraction offered in the DG and UG. The distributions for conventional managers and students exhibit the usual pattern. The dictator game's cumulative distribution is higher, which is consistent with DG offers being less generous than UG offers. Precisely, the only group for which we cannot reject the equality of the two distributions is the group of co-op managers (Kolmogorov-Smirnov test:  $p$ -value=0.139). Acting in the role of proposers, and given the veto power that responders have in this game, conventional managers and students' behaviour partly reflects the strategic concern of avoiding a rejection.<sup>29</sup>

<sup>29</sup> The strategic nature of the UG implies that subjects with different degrees of altruism may exhibit similar choices. For example, in the canonical Fehr and Schmidt (1999) model of inequity aversion, under

Turning to responders' behaviour, we rely on the minimum acceptable offer (MAO) in the UG as a measure of negative reciprocity, i.e. subject's willingness to punish unfair proposers at a material cost to herself. In Figure 8 (right), we report the average MAO by group. Acting as responders, co-op managers' MAO is approximately 40% of the endowment. Conventional managers are willing to accept slightly lower offers. However, the difference between the two groups is not statistically significant. The resulting average rejection rate was roughly 25% and similar across groups.

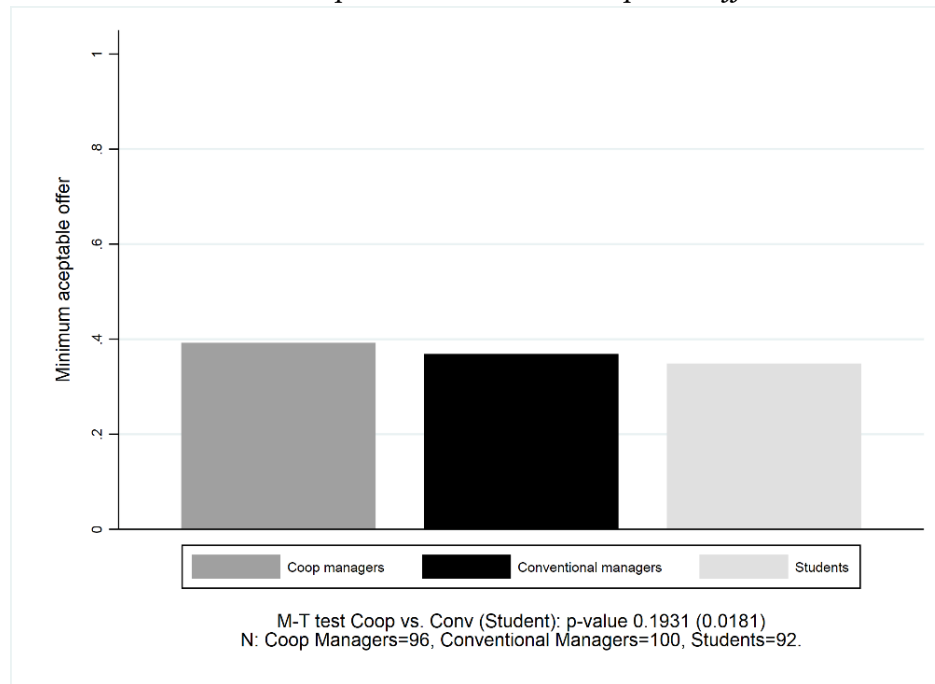
Figure 8. Ultimatum Game:

Panel A. Proposer's Mean Offer



moderate degrees of other-regarding preferences UG proposals do not depend on proposers' degree of inequity aversion but only on proposers' expectations on receivers' preferences. In our context, this might explain why coop and conventional managers' exhibit similar proposer behaviour in the UG game although DG results show that Coop managers are more altruistic.

Panel B. Responder's Minimum Acceptable Offer



**RESULT 5.** *Subjects' behaviour in the Trust Game reveals that trust and trustworthiness are not significantly different between co-op and conventional managers.*

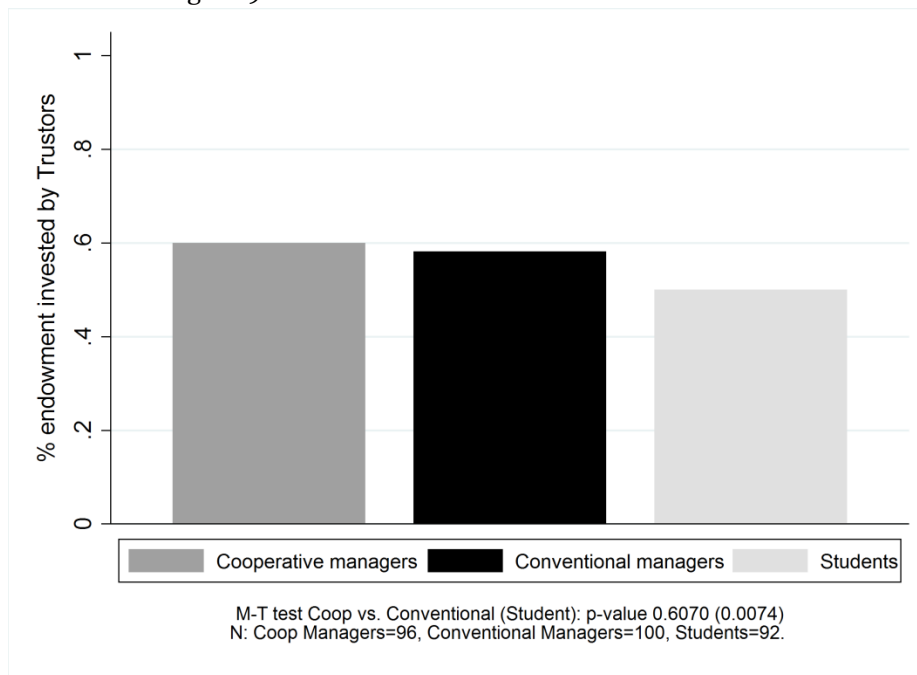
Trust can be defined as a subject's deliberate willingness to make herself vulnerable to the actions of another party (Rousseau et al., 1998; Kocher and Sutter, 2007). In the context of the trust game, trustor's trust is the willingness to transfer a positive amount to the other player with the expectation that the other person will reciprocate at her own cost. The amount returned by the trustee is commonly interpreted as a proxy for this subject's trustworthiness. While trusting behaviour allows to implement Pareto-superior allocations, it is risky for the trustor because a selfish trustee has an incentive to keep everything. Hence, trusting trustors are vulnerable to exploitation.

Figure 9 and 10 report information on trustors and trustees' behaviour, respectively. On average, managers transferred 60% of the endowment.<sup>30</sup> There are no differences between co-op and conventional managers. Interestingly, students trust significantly less than managers in our experiment. This is consistent with previous evidence comparing CEOs and students and with the fact that trust increases with age (Fehr and List, 2004).<sup>31</sup>

<sup>30</sup> Johnson and Mislin (2011) report an average transfer of 50% in their meta-analysis of 162 replications of the trust game. On average, trustees return 37% of the amount available to return.

<sup>31</sup> In an experiment with a sample of MBA students in US, Sapienza et al. (2013) find that trustors transfer an average of 38% of their initial endowment.

Figure 9. Mean Trustor's transfer in the Trust Game



The behaviour of trustees suggests a similar pattern. We elicit trustees' choices using the strategy method. Figure 10 reports the information on the amount returned by trustees for each possible value of trustors' transfers.<sup>32</sup> On average, trustees return 34,7% of the total amount available to return. We do not observe differences in subjects' trustworthiness between co-op and conventional managers. The amount returned by trustees is increasing in the amount transferred by trustors. There is also some indication that managers exhibit more trustworthy behaviour than students do. Results from Mann-Whitney tests indicate that these differences between both groups of managers and students become significant for trustor's transfers of at least 150 points.<sup>33</sup>

#### 4. Self-selection or endogenous preference formation?

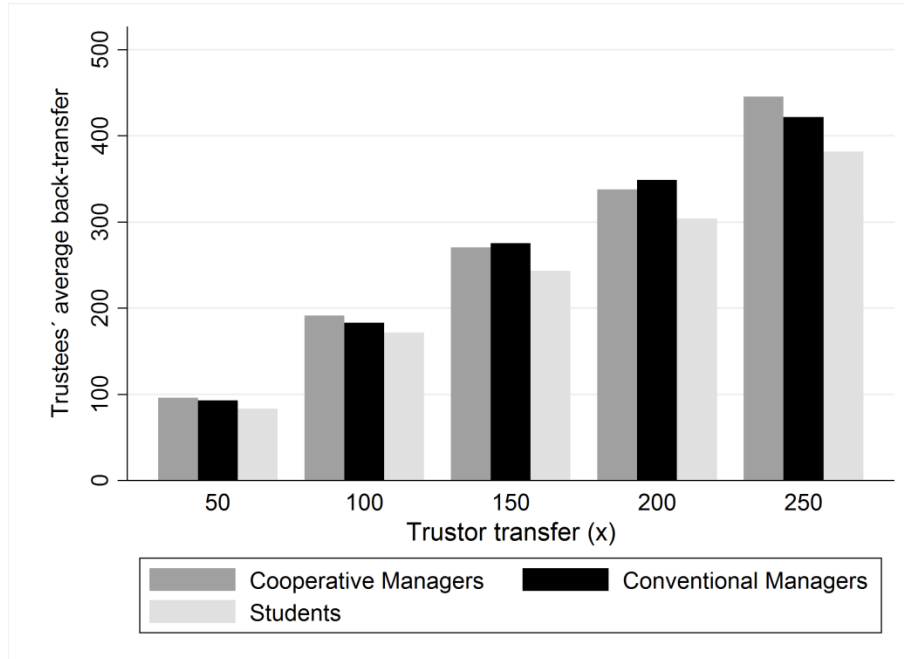
Results presented above suggest that less risk-prone and more altruistic individuals tend to self-select into cooperative managerial positions. However, behavioural differences between individuals in coop and conventional firms could also emerge if working in a cooperative affects individual's preferences. The idea that preferences are malleable and may change because of contextual factors or the long-term exposure to certain institutions is now widely accepted (Bowles, 1998; Fehr and Hoff, 2011). Experimental studies have shown that democratic institutions affect cooperative behaviour (Dal Bó et al., 2010) and organisational decision processes affect ethical behaviour towards outsiders (Ellman and Pezanis-Christou, 2010). Carpenter and Seki (2011) provide field experimental evidence from Japanese fishermen supporting the idea that social preferences are endogenous to the adoption of a cooperative

<sup>32</sup> We exclude trustees' responses involving a rate of return of more than one. Across the five values of  $x$ , this implies excluding an average of 21 subjects of each group.

<sup>33</sup> Regression analysis reported in Tables OA.3.9 and OA.3.10 in Online Appendix confirms that there are no differences between the two types of managers.

institution. Ben-Ner and Ellman (2012) specifically discuss the potential effects of organizational design on employees' preferences.

Figure 10. Trustees' back-transfers for each possible Trustors' transfer value



Although our experiment does not allow us to separate the sorting and endogenous preference formation channels cleanly, we provide suggestive evidence of the effect of cooperative experience on economic preferences by exploiting variation in managers' tenure. If the preference formation channel is important, one should observe some type of correlation between managers' preferences and tenure. This exercise should be interpreted with caution, as manager's tenure is obviously endogenous.

Figure 11 reports results from non-parametric locally weighted regressions (lowess). An exploratory analysis of the relationship between risk preferences and tenure among cooperative managers does not reveal any discernible pattern. The same seems to hold for the relationship between give rate in the dictator game and tenure.

Figure 11. Nonparametric regressions (only cooperative managers)

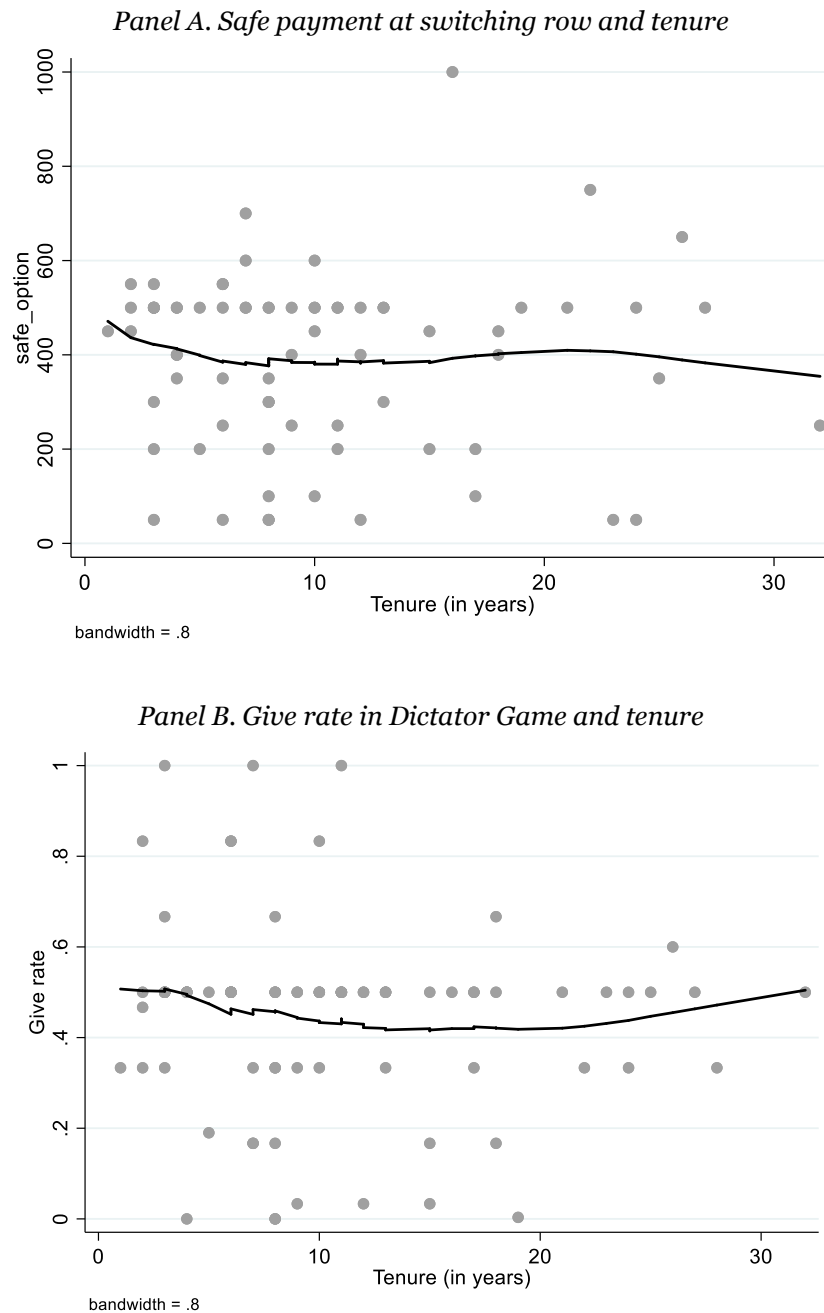


Table A4 in Appendix reports results from additional Probit and Tobit regressions in which we include an interaction between the coop dummy and managers' tenure and control for the potential confounding effect of age and other individual and firm-level covariates. In columns 1-4, we report Probit estimates (marginal effects) in which the dependent variable equals to one if the subject is risk loving and zero otherwise. Consistent with the findings reported above, the status of cooperative manager is associated with a lower probability of being risk loving. The interaction between the coop dummy and tenure is not statistically significant. In columns 5-8, we report Tobit estimates of the determinants of the give rate in the dictator game. Also consistent with the findings discussed above, the coefficient associated with the cooperative dummy is positive and statistically significant. Again, the interaction between the coop dummy



and tenure is not significant.<sup>34</sup> This suggests that differences between cooperative and conventional managers in our study are mainly driven by sorting rather than by cumulative exposure to cooperative institutions.

## 5. Conclusions

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In this article, we characterize the economic preferences of cooperative managers. We gathered incentive-compatible measures of risk preferences, time preferences, reciprocity, altruism, and trust in the context of a lab-in-the-field experiment. Our preliminary analysis supports two main conclusions. First, the fraction of risk loving subjects is lower among co-op managers compared to conventional managers. Second, co-op managers appear to be more altruistic than their conventional counterparts. We do not observe significant differences between the two groups across other preference domains, such as impatience, trust, and reciprocity.

As managers' preferences mediate important strategic decisions within firms, our results may have important implications for understanding the behaviour of cooperatives in competitive markets. The documented differences between co-op and conventional managers in terms of risk preferences and altruism seem consistent with well-documented facts about the actual behaviour of cooperative firms, such as their concentration in less risky and less capital-intensive industries (Podivinsky and Stewart, 2007) and their egalitarian compensation policies (Abramitzky, 2011; Burdín, 2016). Further research is needed to understand how co-op managers' preferences interact with those of worker-members and correlate with organizational design and performance.

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<sup>34</sup> Interestingly, manager's age is positively correlated with the give rate in the Dictator game. The interaction between the coop dummy and age is negative and significant, which means that cooperative managers behave less generously as they get older.

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## Appendix A. Additional Tables and Figures

Table A.1 Risk loving managers. Average marginal effects of Probit Model

	(1)	(2)	(3)
Cooperative	-0.12** (0.06)	-0.11** (0.06)	-0.11** (0.05)
Student	0.02 (0.05)	0.11 (0.09)	
Observations	288	288	196
Manager controls	No	Yes	Yes
Firm controls	No	No	Yes

*Notes:* Average marginal effects of probit estimations. Dependent variable: dummy of risk lover subject. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Conventional manager is the omitted variable in all columns. Columns 1 and 2 include managers and students. Column 3 only includes managers. Manager current controls: gender, age, four education dummies. Firm controls: three dummies for firm size and five industry dummies.

Table A.2. Determinants of allocations (give rate) in Dictator Game.

	(1)	(2)	(3)
Cooperative	0.07* (0.04)	0.07 (0.04)	0.07 (0.04)
Student	-0.08* (0.04)	-0.03 (0.07)	
Observations	288	288	196
Respondent controls	No	Yes	Yes
Firm controls	No	No	Yes

*Notes:* Tobit model estimates. Dependent variable: percent transferred by dictator. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Conventional firm is the omitted variable in all columns. Columns 1 and 2 include managers and students. Column 3 only include managers. Respondent controls: gender, age, four education dummies. Firm controls: three dummies for firm size and five industry dummies.



Table A.3. Determinants of egalitarian (equal split) and purely selfish allocations in Dictator Game. Average marginal effects of Probit Model.

	Equal split (give rate=0.5)			Selfish allocation (give rate=0)		
	(1)	(2)	(3)	(4)	(5)	(6)
Cooperative	0.180*** (0.0642)	0.187*** (0.0640)	0.200*** (0.0650)	-0.157*** (0.0566)	-0.157*** (0.0544)	-0.120*** (0.0442)
Student	-0.102 (0.0692)	-0.0391 (0.107)		0.0296 (0.0457)	0.0577 (0.0795)	
Observations	288	288	196	288	288	196
Respondent controls	No	Yes	Yes	No	Yes	Yes
Firm controls	No	No	Yes	No	No	Yes

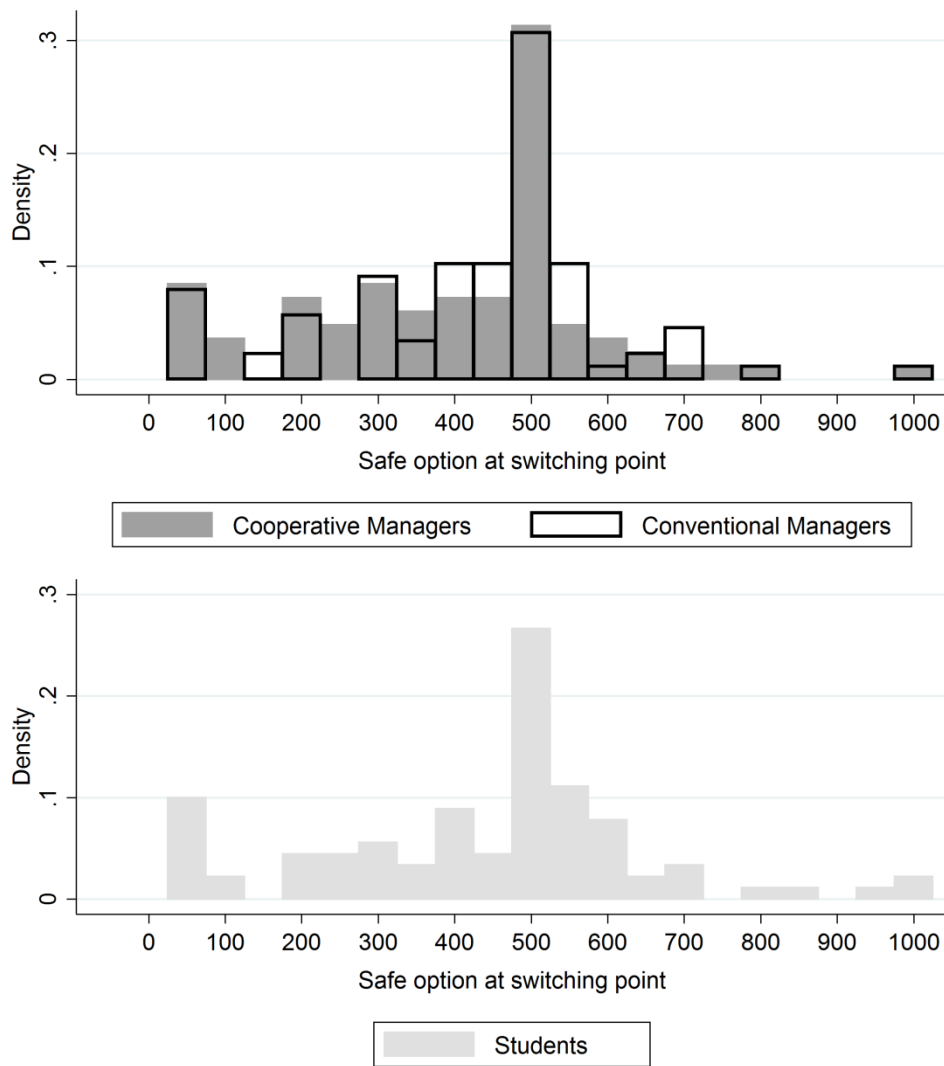
*Notes:* Average marginal effects of Probit estimations. Dependent variable: dummy of equal split (Columns 1-3) and dummy of selfish allocation (Columns 4-6). Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Conventional manager is the omitted variable in all columns. Columns 1, 2, 4 and 5 include managers and students. Columns 3 and 6 only include managers. Respondent controls: gender, age, four education dummies. Firm controls: three dummies for firm size and five industry dummies.

Table A.4. Tenure effects on risk preferences and give rate in Dictator Game

	Risk lover subject				Percent transferred by dictator			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cooperative	-0.158*** (0.055)	-0.128** (0.059)	-0.734** (0.297)	-0.780** (0.309)	0.078* (0.045)	0.079* (0.048)	0.455** (0.187)	0.457** (0.185)
Tenure		0.004* (0.003)	0.002 (0.003)	0.004 (0.004)		0.000 (0.002)	-0.004 (0.004)	-0.006 (0.004)
Tenure×Cooperative			0.007 (0.007)	0.005 (0.006)			0.001 (0.006)	0.003 (0.006)
Age			0.001 (0.003)	-0.000 (0.003)			0.009*** (0.003)	0.009*** (0.003)
Age×Cooperative			0.010 (0.006)	0.012* (0.006)			-0.009** (0.004)	-0.010** (0.004)
Observations	174	174	174	174	174	174	174	174

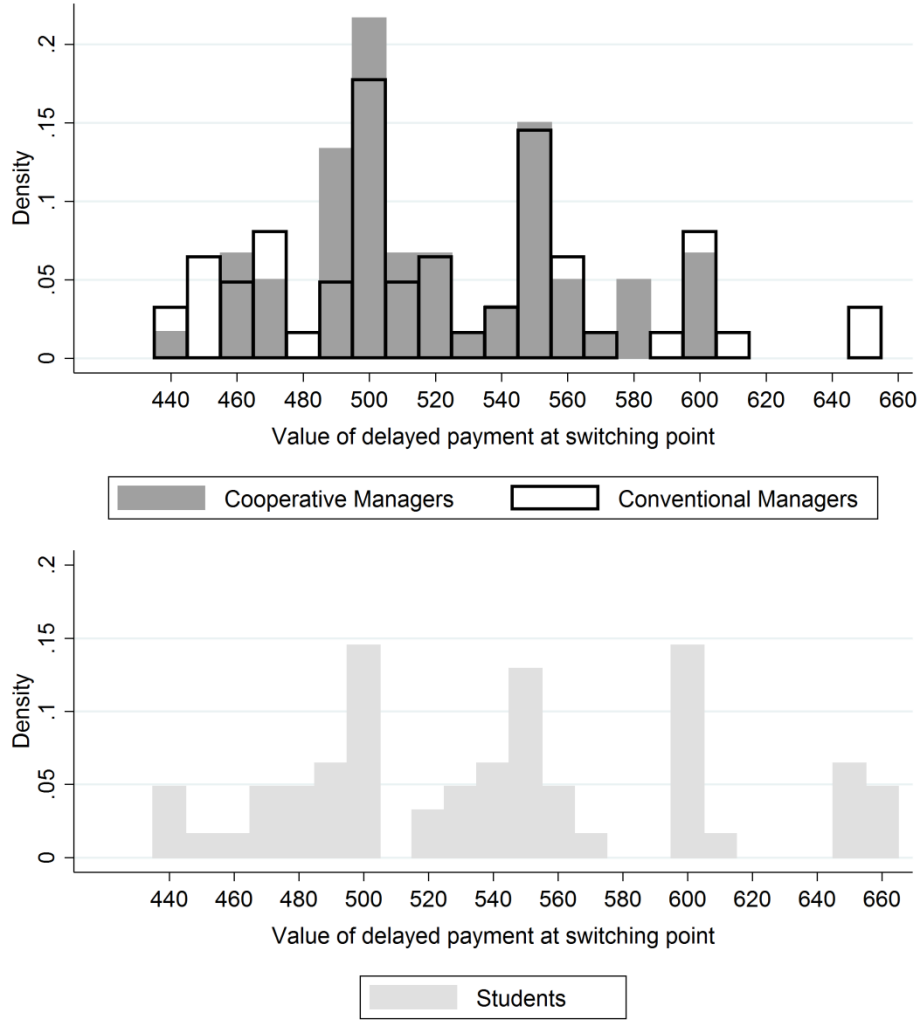
Notes: Columns 1 to 4: average marginal effects of Probit estimations, dependent variable: dummy of risk lover subject. Columns 5 to 8: Tobit estimations, dependent variable: percent transferred by dictator. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Conventional firm is the omitted variable in all columns. Columns 4 and 8 include age, sex, and education controls.

Figure A.1 Histograms of safe options at switching point. Risk game



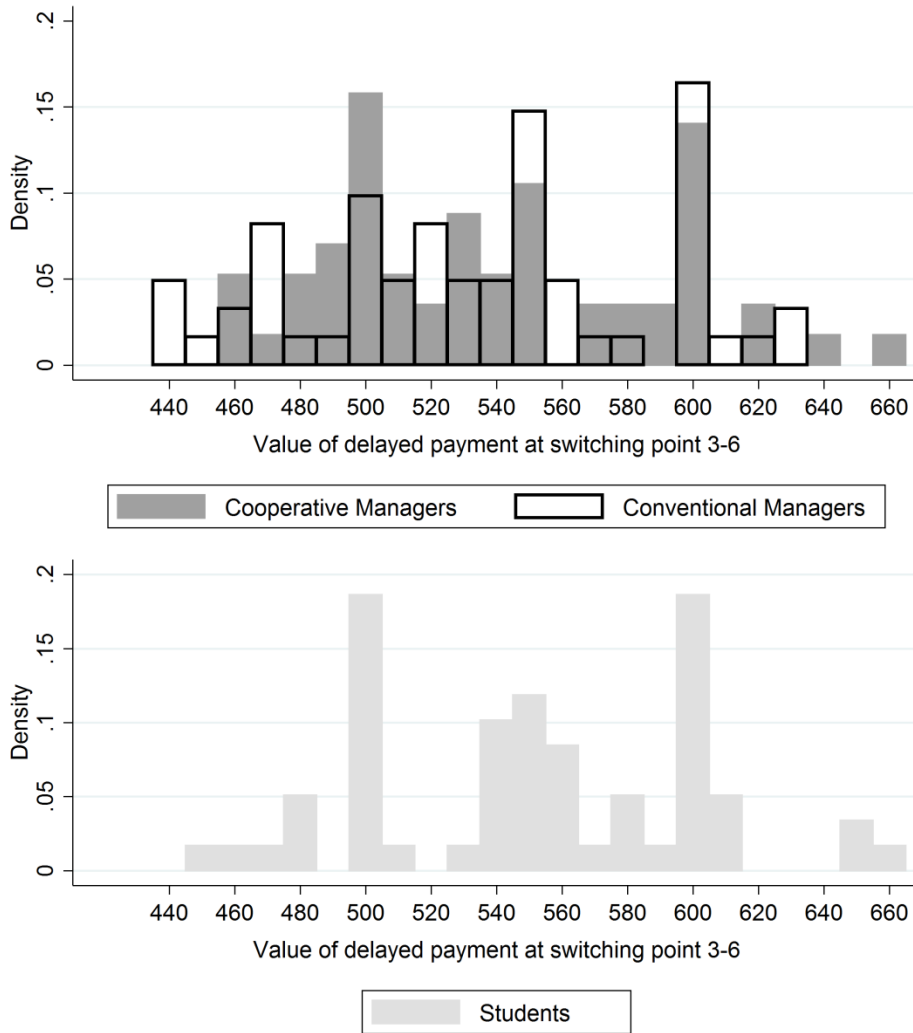
N: Coop Managers=83, Conventional Managers=88, Students=90

Figure A.2 Histograms of delayed payment at switching point (0-3 months)



N: Coop Managers=60, Conventional Managers=62, Students=62

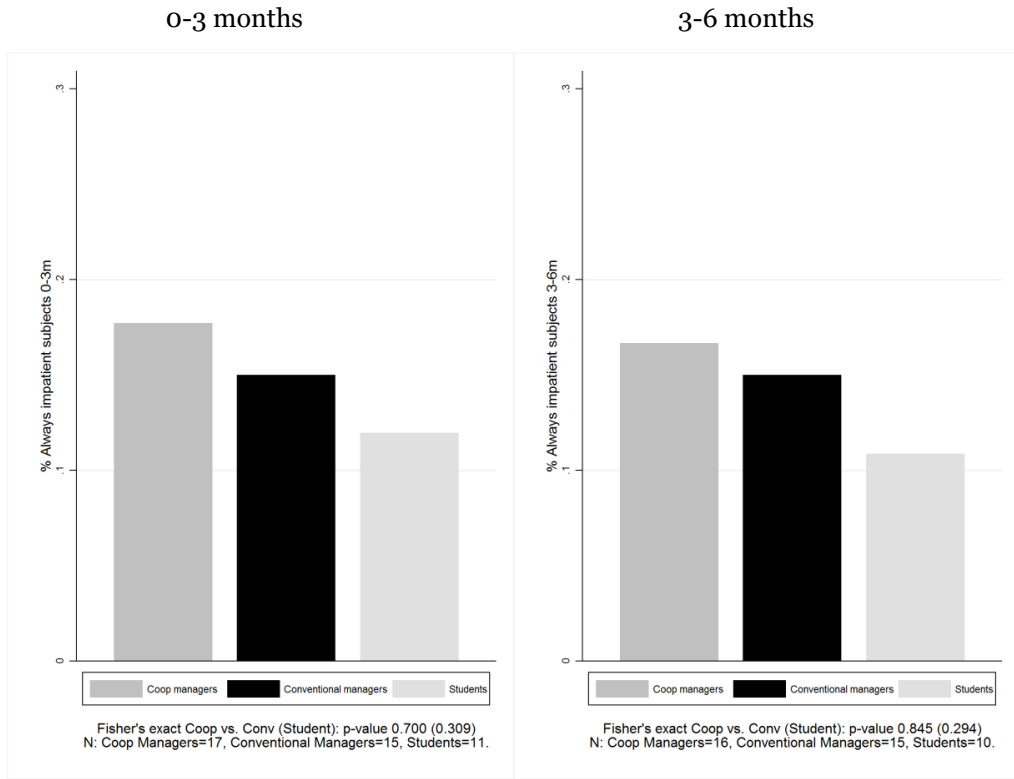
Figure A.3 Histogram of delayed payment at switching point (3-6 months)



N: Coop Managers=57, Conventional Managers=61, Students=59

Figure A.4. Fraction of non-switchers in intertemporal choice experiment.

Panel A. Fraction of always-impatient subjects



Panel B. Fraction of always-patient subjects by group and choice set

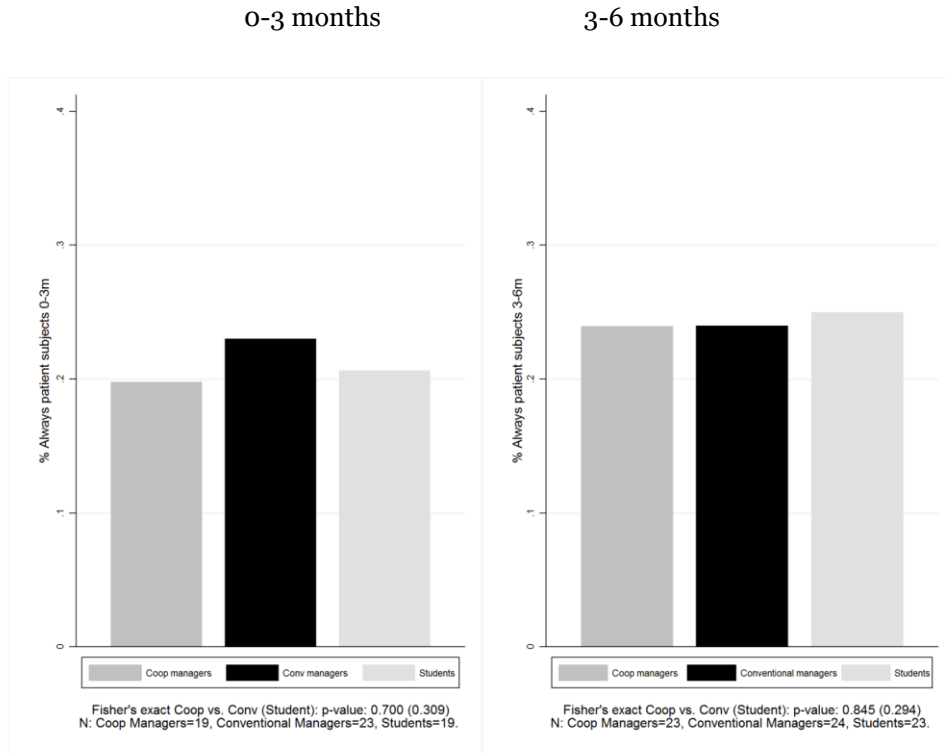
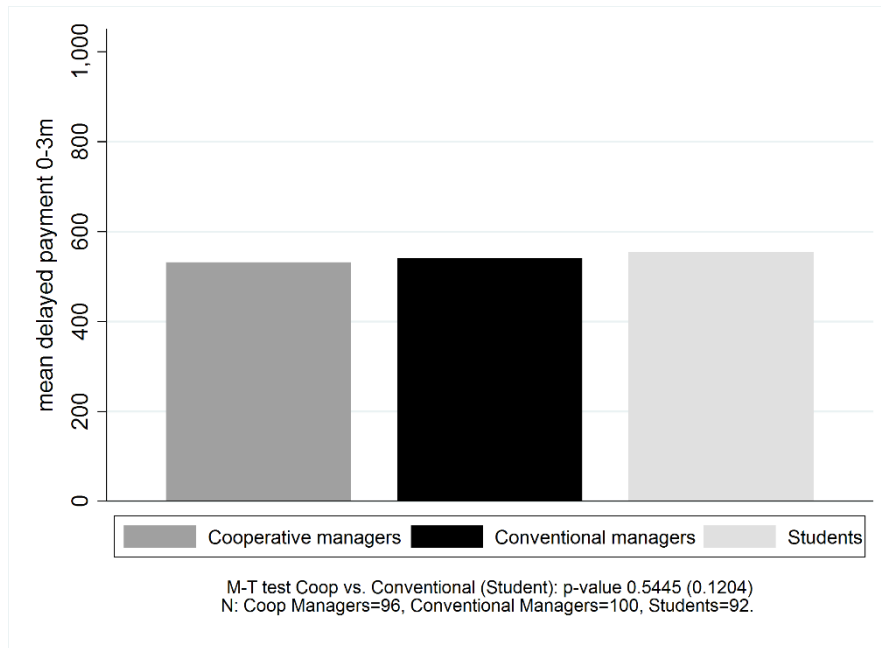
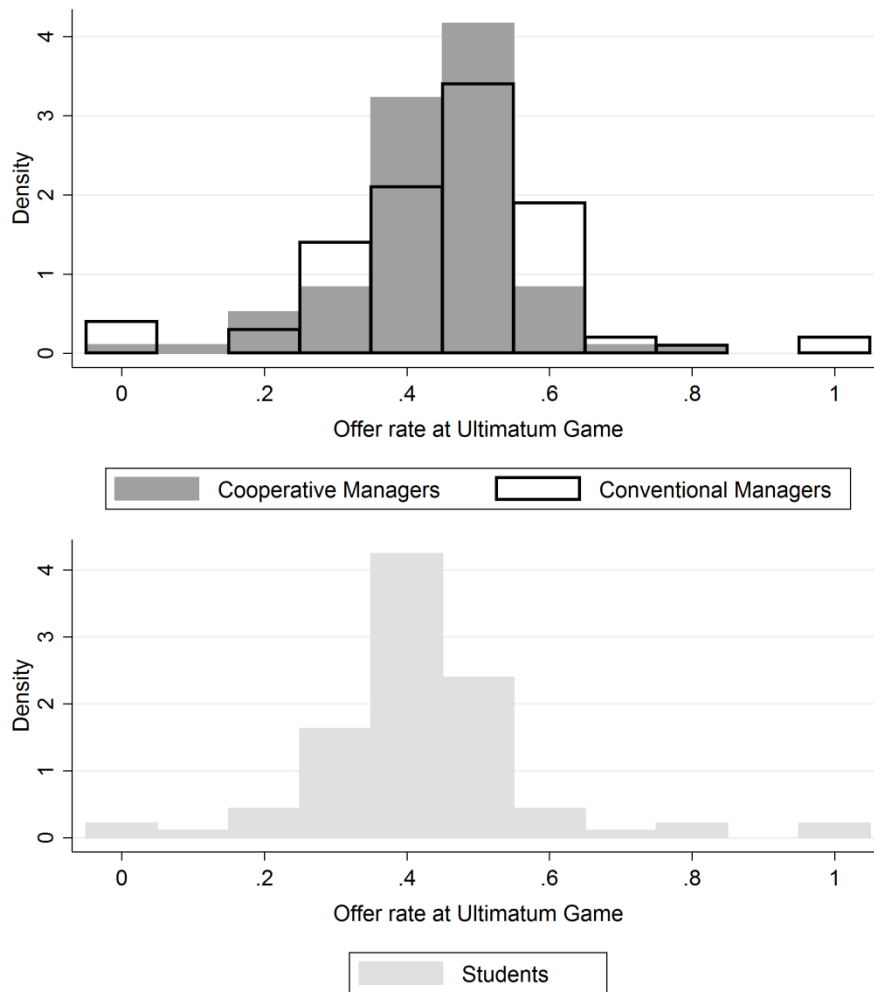


Figure A.5. Mean delayed payment imputing extreme values for non-switchers



Note: We apply the following rule to impute extreme values to non-switchers. For non-switchers who are always impatient, we assigned them what would be the following value after the highest postponed value in the list (i.e. 690 points). For non-switchers who are always patient, we assigned them what would be the previous value before the lowest postponed value in the list (i.e. 370 points).

Figure A.6. Histogram with distribution of offers in the Ultimatum Game



N: Coop Managers=96, Conventional Managers=100, Students=92



Figure A.7 Cumulative distribution function of give rates in the Ultimatum Game and Dictator Game

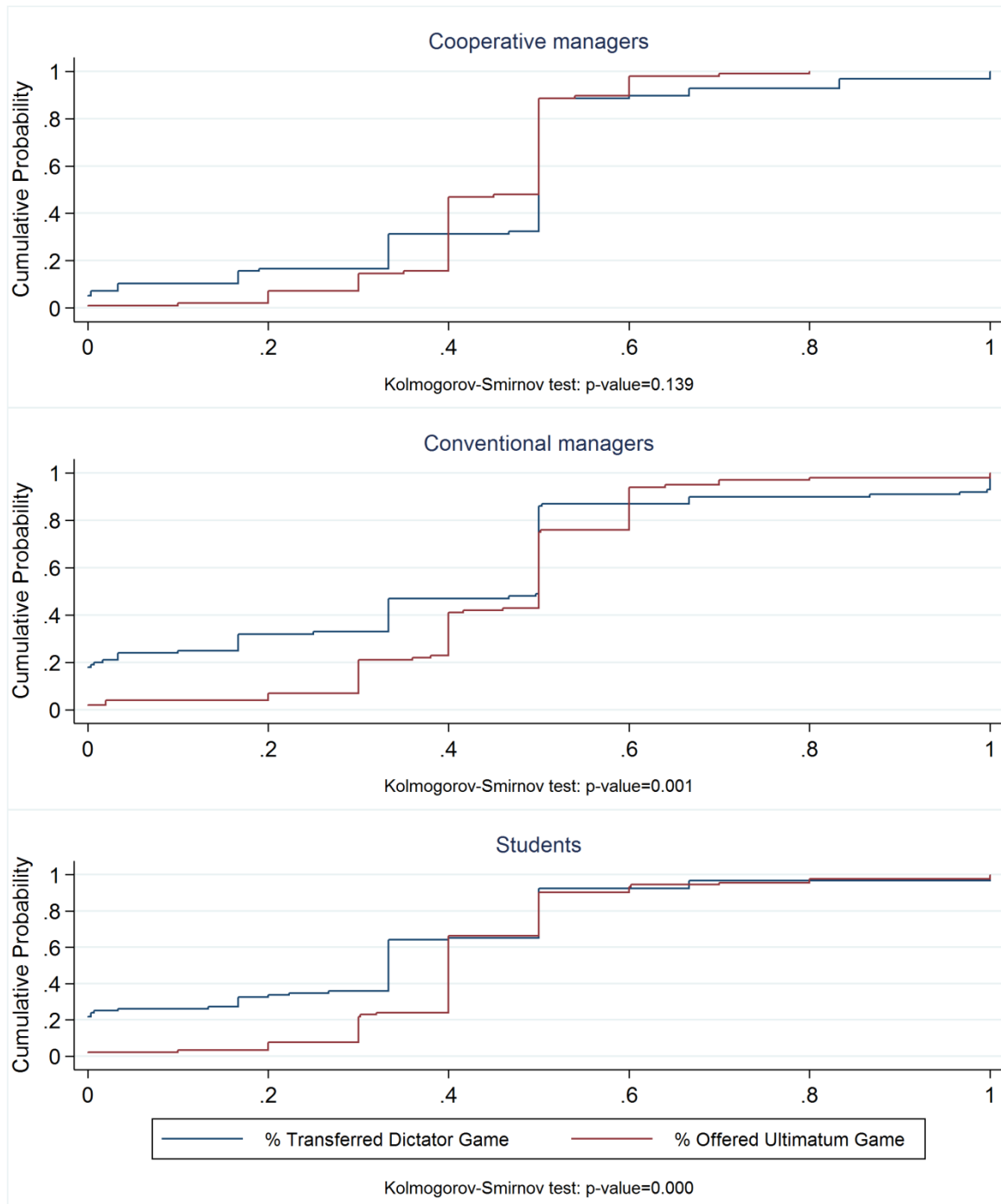
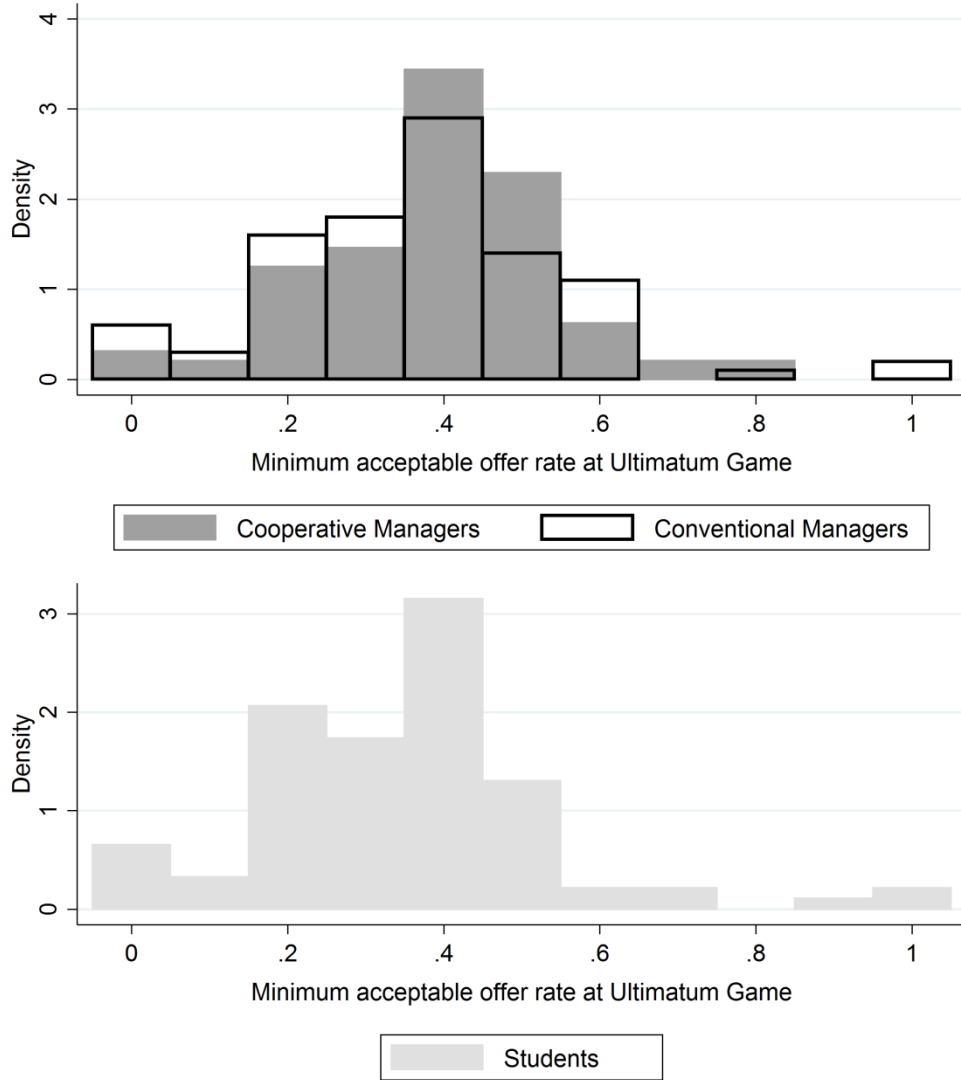
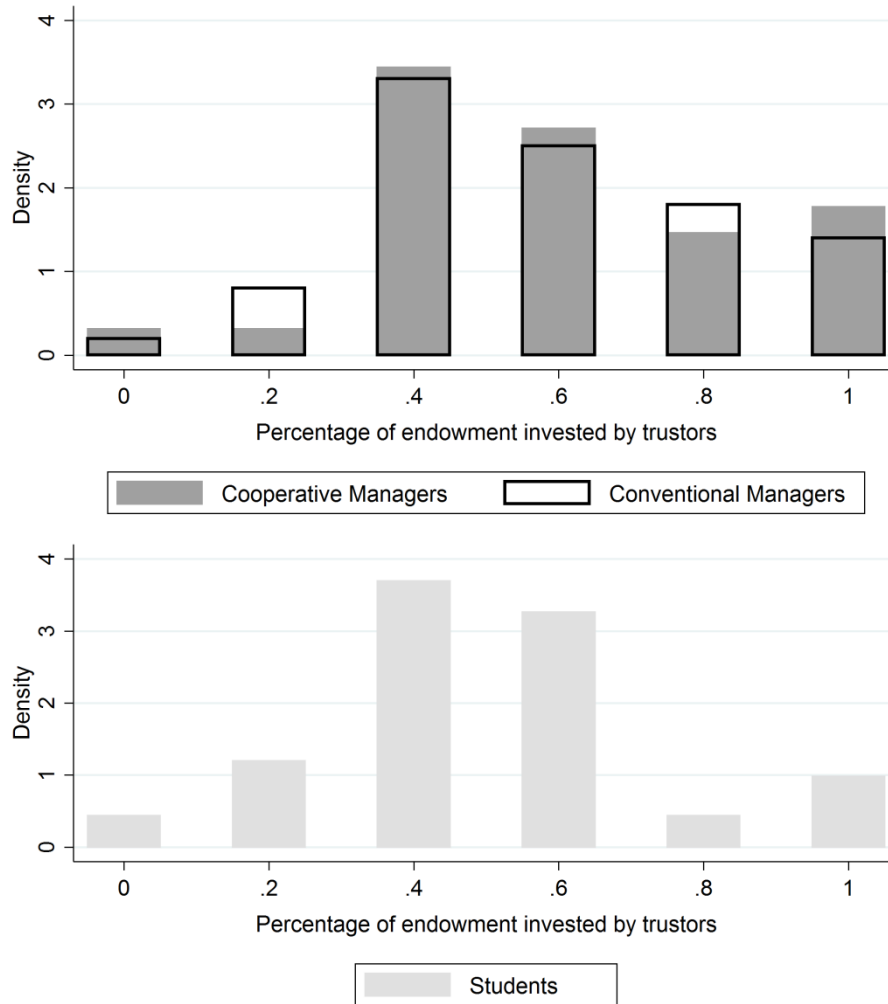


Figure A.8 Distribution of minimum accepted offers in the Ultimatum Game



N: Coop Managers=96, Conventional Managers=100, Students=92

Figure A.9. Distribution of Trustors' transfers in the Trust Game



N: Coop Managers=96, Conventional Managers=100, Students=92

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