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Essays in Behavioural and Experimental Economics: Self-selection and Incentives

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STATEMENT OF ORIGINALITY

This is to certify that to the best of my knowledge, the content of this thesis is my own work. This thesis has not been submitted for any degree or other purposes. I certify that the intellectual content of this thesis is the product of my own work and that all the assistance received in preparing this thesis and sources have been acknowledged.

Guglielmo Briscese
Sydney, December, 2016

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INTRODUCTION

This thesis discusses the importance of self-selection to understand how individuals behave and respond to incentives. Individuals self-select themselves into their preferred contracts in a number of ways. Labour contracts are a clear example where individuals choose a job according to its characteristics, whilst also aligning to their personal preferences and skills. The reasons why a worker chooses a job can predict how likely she or he will respond to different incentives, such as financial or social incentives. The economics wage efficiency theory predicts that a higher wage can both attract more productive workers and enhance performance. Laboratory experiments have constituently proven this theory, showing that when employers pay workers a 'fair' wage, workers reciprocate by working harder, as in a gift exchange fashion. Other studies have argued that social incentives can be equally effective at achieving the same goal: employers that donate a portion of their profits to charity, often known as Corporate Social Responsibility (CSR), can be attractive to workers and motivate them to work harder even at wages that are lower than competitor employers. More recently the gift exchange theory was challenged by field experiments that found little evidence of reciprocity.

In the first chapter on this thesis, I argue that an important gap has not been addressed by the literature, namely, how sorting mechanisms can affect reciprocal behaviour. In lab experiments, employers and workers are often randomly and bilaterally matched in every round of a game. Whilst outside the controlled laboratory environment, workers choose the employer they want to work for and then decide how hard they are willing to work. To address this gap, I designed a modified version of the gift exchange game – the most commonly used game to study experimental labour markets – where two employers and one worker are randomly grouped together. In this experiment employers can use their initial

capital to make wage offers to workers and donate any percentage of their potential profits to charity (i.e. the level of CSR). In the control group workers are randomly matched to one of the two employers, as in other standard laboratory settings. In the treatment group, in every round workers can choose an employer from a set of two competitors, before determining their level of effort.

The first key result I found is that workers always choose the employer offering the higher wage. Furthermore, workers choose the employers offering a higher level of CSR only when the wage offer is identical to that of a competitor. I also find that wages have a larger marginal effect than CSR at enhancing workers' effort. The second contribution of this chapter is its reconciliation of the mixed evidence between field experiments and lab experiments. I find that the presence of competition among employers reduces the level of reciprocity from workers. I argue that workers already reciprocate higher wage offers by choosing an employer over a competitor, hence feeling less pressure to work harder once in the job.

Based on findings from the first experiment, I returned to the lab to test the role of competition and self-selection in a modified version of the earlier gift exchange game, this time without the presence of CSR. The results of this second experiment are the topic of Chapter 2. I again find that the presence of competition reduces reciprocity, supporting findings from Chapter 1. Another contribution of this chapter is the study of how external wage offers affect workers' behaviour. In the control condition of the experiment workers cannot select their preferred wage offer and are randomly matched to one of the two employers, but they can still see the offer of the unmatched employer. I find that this external wage offer influences workers' behaviour as a reference point: after controlling for all other factors, when workers are randomly matched to the employer offering a higher wage they provide higher levels of effort. More striking and significant is the evidence of loss

aversion: subjects were more responsive to subjective losses than gains – that is, being paired to an employer who offered a lower wage was more 'painful' to the worker and led to a stronger (negative) reaction, than being paired to the higher offer employer, which led to a weaker (positive) reaction. In other words, workers penalised more employers that offered a lower wage than rewarding employers that offered a higher wage. Previous studies showed that reference points can influence workers' effort. These include a target income they set for themselves or the amount other similar workers earn. In this experiment we show that another important reference point is the wage offered by another employer. If the current employer offers a wage that is above that of an external employer, workers will reciprocate by working harder, beyond the reciprocal response that would have occurred without the presence of the outside offer. If the wage offer is lower than that of a competitor, the worker will punish the employer with significantly lower effort.

In the last section of the second chapter I compare results from the two experiments and show that in a competitive environment employers must compete more aggressively by offering higher wages to attract and motivate workers. Shifting resources away from wage offers to increase the level of CSR can lead to lower levels of reciprocal behaviour from workers and, consequently, reduce employers' earnings. Employers interested in engaging in Corporate Social Responsibility initiatives as a Human Resources Management strategy to attract and motivate workers should consider how different types of workers will have varied responses to social incentives compared to more traditional financial incentives. Moreover, employers should understand the characteristics of the job that attracted their workforce in the first place so as to design incentives that reflect their preferences.

In the last chapter of this thesis I explore the role of self-selection in determining the effectiveness of defaults. Defaults proved to influence behaviour across a range of areas, from retirement savings to organ donations. Perhaps the main reason why defaults are effective is that individuals have a strong tendency to remain in their current situation rather changing to an alternative option. This is often referred to as 'status quo bias'. Seeing as this bias strongly influences human behaviour, it is important to understand why and how individuals self-select into a situation or contract in the first place in order to design effective defaults. At the same time, a key challenge presented by defaults is that they can reduce an individuals' sense of control, and be ineffective or counterproductive if they do not reflect the decision-maker's preferences and past behaviour.

I study the role of defaults in a previously unexplored setting where a preference for control might be stronger than in other contexts: charitable giving. I analyse results of a field experiment ran by an NGO hosting an online peer-to-peer microlending platform. Lenders who had their loans fully repaid, but did not take any action for more than a year, received an email inviting them to use their money by a certain date in any way they preferred – withdraw, lend, donate or leave idle. In two treatment groups, lenders were told that if they did not take any action by the given date, their money was automatically going to be donated to the organisation ('default donation') or re-lent to a group of borrowers on their behalf ('default loan'). Results show that both defaults were more effective at increasing the proportion of individuals giving to charity and the average amount given, compared to a simple ask. However, the default loan treatment was significantly more effective than the default donation. This suggests that to influence behaviour without risk of backfiring, defaults should be designed to consider individuals' past behaviour and self-selection. Government agencies, not-for-profit, and private sector organisations interested in implementing defaults should first aim to

understand why and how individuals find themselves in a specific situation or contract in the first place. Defaults that reflect a decision-maker's preferences have a higher chance of achieving their intended objectives. Preferences can often be elicited by observing past behaviour. Furthermore, it is important to understand that choices made in the past can influence behaviour as reference points. Testing and evaluating different types of defaults can help improve their effectiveness and avoid counterproductive consequences.

The three chapters in this thesis can be considered as individual standalone papers. The reader can review each chapter separately without loss of context. Each chapter includes an introduction, a literature review and hypotheses, and a discussion of the results from the experiments. Recommendations for future research and policy are discussed in the conclusions of each chapter.

CHAPTER 1

Self-selection and Motivation: The Effectiveness of Financial and Social Incentives in a Gift Exchange Game with Sorting

In this paper we study the role of social incentives, such as donating a portion of a company's profit to charity (often known as Corporate Social Responsibility – CSR) to attract and motivate workers, and their interaction with more traditional financial incentives (i.e. higher wages). We implement a varied form of the gift-exchange game where employers can make wage offers to workers and donate any percentage of their potential profits to charity. In our treatment group we introduce a sorting mechanism to allow workers to choose, in every round, the employer they prefer from a set of two competitors. Results show that workers always choose the higher wage offer, driving up wages faster in competition. CSR levels instead remain almost identical over time, on average between 10%-20% of an employer's profit. Workers choose employers with higher CSR only when wage offers are identical. We find that workers are more responsive to higher wages than higher CSR, suggesting that higher wages remain the most effective mechanism to attract and motivate workers. Employers can use CSR as a social signal to attract workers only when wage offers are identical with their competitors, but can expect this to have more limited impact on inducing workers' effort. This is in contrast with previous studies showing that social incentives can motivate workers to work harder at lower wages. Lastly, we find that the presence of competition reduces reciprocity from workers, possibly because workers already reciprocate a higher wage offer by choosing the employer over a competitor. This finding can help reconcile evidence from lab and field experiments examining gift exchange.

Labour contracts are incomplete by nature. The relationship between an employer and a worker is often regulated by contractual agreements, but effort is often hard to measure and enforce, and it may be induced by a number of factors outside mere contract clauses. Insights from behavioural economics – the growing literature at the intersection between psychology and economics – can help provide a better explanation about what motivates workers.

The starting point of the behavioural economics literature on labour markets is Akerlof's (1982) theory of partial gift exchange, according to which workers will work harder when they are paid what they will perceive is a 'fair wage' (as a form of *quid pro quo* gift-exchange). As a consequence, employers will want to keep offering wages that are higher than market-clearing levels to induce higher effort from workers and increase marginal productivity[1]. The theory has been supported empirically by the lab experiment 'gift-exchange game' designed by Fehr et al. (1993) and the many subsequent studies that replicated it with different variations.

More recent studies suggest that workers might not respond only to higher wages, but also social incentives – such as donating a portion of an employer's profit to charity, often known as Corporate Social Responsibility (CSR). Koppel and Regner (2014) and Tonin and Vlassopoulos (2015) show, for instance, that informing workers that a portion of the employer's profits generated from their work (or a portion of their own earnings) will be donated to a charity of their choice leads to higher levels of effort. Other studies even claim that companies that shift from profit maximisation strategies to focusing on achieving social goals can be successful at attracting productive workers, even at wages that are lower than competitors in the same sector (Bachaus et al. 2002; Montgomery et al., 2003).

[1] Akerlof (1982), Shapiro and Stiglitz (1984), Akerlof and Yellen (1990) suggested that under this setting, equilibrium unemployment results as a number of (unemployed) workers will be willing to work for lower wages, but firms will have no incentives to lower wages as they can get higher productivity by paying existing workers slightly more.

In this study we contribute to this growing literature by adding an important element of real-life scenarios that is often omitted in laboratory gift-exchange experiments, which is that workers first choose the employer they want to work for and then choose how hard they want to work. Because workers sort themselves into their preferred labour contracts and jobs, they might be more or less responsive to different types of incentives (e.g. financial versus social), depending on the motivation that led them to choose an employer or job position over another in the first place. To explain how self-selection can affect the impact of incentives, one can think of an hypothetical pair of workers, say an investment banker and a social worker: both will choose their jobs based on some specific features (e.g. attractive bonus versus high social impact) which they will expect to be reflected in the incentives that their employers will offer after they started in the job. As such, social incentives might work on some cohorts of workers but not all, depending on why they sorted themselves into a job. Not taking this important factor into account can lead to overestimation of the impact of non-traditional type of incentives.

To study the role of self-selection and different types of incentives on worker's motivation, we implement a modified gift exchange game, where employers can use their starting capital to make a wage offer to a worker and allocate any preferred portion of potential profits to charity. On every round, the worker can choose an offer between two employers randomly and anonymously grouped with her, and self-select herself into a preferred contract[2]. Our results show that CSR is less effective than wages to attract and motivate workers. We find, however, that under equal wages, higher CSR offers increase the chances of an employer being chosen against a competitor, which is in line with other studies showing that altruism can work as a social signal to increase partner attractiveness. We also find that the

[2] To explore our research question in a field experiment, we would need to modify wages and CSR and observe effort, which might also lead to some workers wanting to change employer. As these manipulations are clearly infeasible in a field experiment, the gift exchange game laboratory experiment provides the most suitable alternative to test our hypotheses.

presence of employer competition reduces the level of effort provided by the worker, suggesting that workers might feel they have already reciprocated a higher wage offer by choosing the employer over another, hence feeling less pressure or need to reciprocate again by working harder. The remainder of the paper is as follows: in the next section we review the relevant experimental literature on gift exchange game and sorting mechanisms, with a brief overview of the more limited economics literature on CSR. We then describe the experimental design and the observed behaviour between treatments. In the last sections we present and discuss our results. Based on the results of this experiment, we returned to the lab to test the role of competition alone on wages, removing potential noise from the introduction of CSR. The details and results of this experiment are the topic of the second chapter of this thesis.

I. Related Literature

A. Reciprocity and Gift Exchange Games

Reciprocity can be defined as a mutual exchange of favours between two parties that is not necessarily regulated or enforced by stipulated agreements. In the context of labour markets this term is often used to define the cooperative behaviour between an employer and a worker that is not captured by legal contracts. Akerlof (1982) hypothesised that employees who are paid more than the minimum wage for their job will provide higher levels of effort, even when this reciprocal behaviour is not bound by contractual clauses. This is in sharp contrast with the standard models of classical economics where the rational self-interested worker would be expected to provide the same level of effort stipulated in the contract whilst receiving a higher wage.

Fehr et al. (1993) designed a laboratory experiment, known as the 'gift exchange game', to seek empirical evidence of this hypothesis. In a typical gift exchange game setting, players are assigned the role of employer or worker and are randomly and anonymously paired together. In every round, the employer is given an initial capital that she can allocate between making a wage offer to the paired worker, and keeping to herself. The worker sees the wage offer and chooses a preferred level of effort with its associated costs, deducted from the accepted wage. Results from a large number of studies that replicated this experiment with numerous variations consistently find that workers "deviate away from self-interested-based prediction" (Fehr et al. 1998), or what is defined as a Nash equilibrium, and provide levels of effort that are higher than they would otherwise be expected to provide.

Some of the many variations of this experiment showed that workers may be responsive also to non-monetary rewards, suggesting that signaling reciprocity might be as important as the value of the incentive per se (Kube et al. 2012). Other experiments also showed how workers' likelihood to reciprocate can depend on their work experience (Hanna et al. 2002), the size of the workforce (Maximiano et al. 2007), the perceived level of wealth of the employer (Kessler, 2013) or the wages of the co-workers (Abeler et al., 2010). Charness (2012) also suggested that workers will work harder when they are given the opportunity to set their own wages, as a sign of trust and self-imposed accountability.

Consistent with lab findings, some field experiments confirmed the presence of gift-exchange (Falk, 2007). Other field experiments, instead, found that reciprocity can vanish over longer periods of time and that this might not be captured by standard lab settings (Gneezy and List, 2006), leading some researchers to question the external validity of laboratory experiments (Levitt and List, 2007). Some authors tried to reconcile these findings, suggesting that both in the lab and in the field, experiments introduce some form of manipulations that can affect the results of the study (Falk and Heckman, 2009). In this paper we suggest two more possible

explanations that can help reconcile these mixed findings. The first one is that the way subjects are recruited in the experiment matters: individuals sort themselves into their preferred contracts depending on the wage offers and the nature of the work they can expect to perform. The second is that in the standard gift-exchange game a worker is usually paired bilaterally with the employer, hence the evaluation of what can be considered as a 'fair wage' is not based on what the worker could earn with another employer, as instead is the case in naturally occurring settings outside of the lab, where workers are able to make comparisons of what they perceive is a 'fair wage' against some 'reference wage'. The importance of reference points to reconcile some of the lab and field evidence on reciprocity is explored more in detail in the second chapter of this thesis. In this chapter we show how the selection of the employer can be considered as an act of reciprocity in itself, leading workers to reduce effort.

B. Individual and Corporate Social Responsibility

Over the past few decades, private sector companies around the world started to get more involved in not-for-profit activities, often supporting charitable causes. Perhaps the most common way companies engage in these initiatives is by donating a portion of their profits to charity, often referred to as 'Corporate Philanthropy' or 'Corporate Social Responsibility' (herein CSR) (see Chang, 2008 for a brief review of the management and marketing literature on the topic)[3].

It is yet unclear whether these initiatives are effective at achieving their intended social goals, but studies found that they can often be effective marketing strategies. For example, informing customers that a percentage of profits from the sales of a product will be donated to charity can significantly increase purchases (Luo, and

[3] CSR can also take other forms, such as partnering of product with a cause, referred to as cause-related marketing (Chang, 2008) or asking employees to take part in volunteering activities or pro-bono work for a charity, among others.

Bhattacharya, 2009; Strahilevitz and Myers, 1998; Strahilevitz, 1999). Other studies suggested that CSR initiatives can also operate as a useful human resource management tool to attract and motivate workers, with some even suggesting that CSR can be a suitable substitute for higher wages (Jones, 2014; Brekke and Nyborg, 2007; Francois, 2003). Recent surveys among University graduates show that job applicants often expect their potential future employers to be 'good corporate citizens' and engage in some form of CSR, even if this would mean to forgo part of their salaries in order to work in a company with a social purpose (Australian Financial Review, 2016)[4]. In this study we want to test whether these survey-based and self-reported preferences are supported by empirical experimental evidence. Specifically, we want to study under what circumstances social incentives (e.g. CSR) can be substitutes or complements for attracting and motivating workers to work harder and to what extent these incentives are effective across all types of individuals, rather than a selected cohort.

Our study also allows us to partially address one common criticism to lab experiments, which is that subjects taking part in these studies are often University students making hypothetical choices, making it hard to generalise findings to the broader population. In our case, instead, this cohort represents the ideal subject pool. Recent graduates who are about to apply for their first job are the human capital that companies and organisations compete to attract and retain. Whilst choosing a job in real life and taking part in a lab experiment have obviously different implications, the choices participants make in our experiment can perhaps be more relevant to them. Studying the role of self-selection and the right mix of incentives on this cohort of the population also makes our findings more relevant.

[4] http://www.afr.com/leadership/company-culture/deloitte-report-finds-millennials-and-employers-in-conflict-over-values-20160208-gmp2ju?&utm_source=social&utm_medium=twitter&utm_campaign=nc&eid=socialn:twi-14omn0055-optim-nnn:nonpaid-27062014-social_traffic-all-organicpost-nnn-afr-o&campaign_code=nocode&promote_channel=social_twitter

C. Sorting in Experiments with Social Preferences

The introduction of sorting mechanisms in lab and field experiments with social preferences is a relatively recent addition to the experimental economics literature. The argument for allowing subjects to choose their partners in experiments is that outside of the lab individuals choose to place themselves in situations where they have the opportunity to behave more or less altruistically or pro-socially[5]. Individuals who instead have lower preferences or regards for others, might tend to avoid such situations in the first place. Lazear et al. (2012) show that in a dictator game (another common laboratory experiment used to measure social preferences), giving subjects the choice to participate or opt out, before allocating a preferred amount to share, affects the likelihood and magnitude of sharing. In an earlier complementary paper, Slonim and Garbarino (2008) show that the sharing behaviour in a dictator game is also dependent on characteristics of whom the subjects choose as their partners in the game (e.g. gender). In the context of experimental labour markets, Dohmen and Falk (2011) apply a sorting mechanism where workers can choose between a fixed and a variable payment scheme. The authors find that output is higher in the variable-payment scheme and is driven mostly by the most productive workers who self-select themselves into this payment option. This suggests that previous lab experiments might have overestimated some of their subjects' tendency to cooperate or reciprocate by ignoring the importance of self-selection.

In our gift-exchange game experiment we take into account these considerations by allowing workers in every round to choose (out of two randomly grouped employers) the employer they want to work for by looking at each employer's wage offer and level of CSR (as a percentage of potential profits donated to charity). We

[5] See Ashraft et al. (2014), and Gagliarducci and Nannicini (2013) for studies on the role of sorting and incentives in the field.

are interested to see whether allowing workers to self-select into their preferred contracts has implications on their level of effort and reciprocity, and whether CSR is more effective than wages to attract workers and induce higher effort at the same time. For the second chapter of this thesis we returned to the lab to test the impact of competition on selection and reciprocity alone, by removing any possible noise that may be due to the presence of CSR. The overall findings from both chapters show that employers are more likely to be selected when they offer higher wages than competitors. We find evidence of reciprocity even when labour supply is lower than demand, with workers providing positive levels of effort even when there is no risk of unemployment. However, competition decreases both the likelihood of a worker reciprocating and the level of effort being provided.

II. Hypotheses

The key features of our gift exchange game are the presence of a sorting mechanism and the addition of social incentives to the more standard financial incentives. We would expect that when labour supply is lower than demand, employers will offer higher wages not just to motivate workers to work harder but firstly to attract them in order to be selected over a competitor. Employers in our game have two incentives they can use to attract workers: wages and CSR. To the extent that workers are motivated by financial (i.e. wage offers) or social (i.e. CSR) incentives and altruism, and self-select themselves into their preferred contract, we expect both incentives to increase in size more in competition than in non-competition. Therefore, our first hypotheses are as follows:

HYPOTHESIS 1. H1: *The presence of competition among employers increases wage offers compared to a non-competition environment*

HYPOTHESIS 2. H2: *The presence of competition among employers increases the levels of CSR compared to a non-competition environment*

As a consequence of this employers' behaviour in competition, we expect workers to reciprocate in a gift-exchange manner in two ways: firstly, by selecting the most attractive employment offer, which will be their preferred mix of financial and social incentives from one of the two competing employers, and secondly by providing effort. In the selection process, we would expect workers driven by financial incentives to choose higher wages and workers driven by a preference for charity to choose higher levels of CSR. How these two incentives influence employer selection when they are presented in the same setting is unclear, hence our hypothesis is that each type of incentive can be equally effective at attracting different types of workers:

HYPOTHESIS 3. H3a: *Higher wages will lead to increased likelihood of an employer being selected in competition*

HYPOTHESIS 3. H3b: *Higher CSR will lead to increased likelihood of an employer being selected in competition*

As in other lab and field experiments, we are interested in examining the presence of gift exchange by observing both the likelihood of a worker to provide positive levels of effort and the actual level of effort being chosen as wages and CSR increase:

HYPOTHESIS 4. H4a: *Workers are more likely to reciprocate and provide higher levels of effort as wages increase*

HYPOTHESIS 4. H4b: *Workers are more likely to reciprocate and provide higher levels of effort as CSR increases*

In our setting, where labour demand is higher than labour supply, it is possible that the process of selecting an employer over another is perceived by the worker as an act of reciprocity in itself. Thus in competition the observed level of effort provided by the worker can be lower, since the worker will feel she has already reciprocated the employer with her choice. This would suggest that previous gift-exchange game lab experiments without the presence of a sorting mechanism might have overestimated the presence and magnitude of reciprocity. At the same time, however, it is possible that when a worker actively chooses her employer in the game, she would feel more prone to reciprocate, in part to confirm her decision. Thus the impact of a sorting mechanism on reciprocal behaviour is unclear and it is worth the inclusion in the hypotheses we are interested in testing in this experiment:

HYPOTHESIS 5. H5: *The effects of wages and CSR on workers' effort will be weaker in competition since workers will have already partially reciprocated employers by choosing them over a competitor*

III. Experiment

A. Design and Procedure

Our experiment is a modified version of the original gift-exchange game by Fehr et al. (1993). In the first stage of the game, all employers in the room decide independently how much of their initial endowment *E* of 120 Experimental

Currency Units (ECU) they want to allocate to make a wage offer *w* to the worker and what percentage of potential profits they want to donate to charity, which we will refer to in this paper as Corporate Social Responsibility (CSR).

In the second stage of the game, the worker sees the wage offer and CSR chosen by two employers randomly grouped with her and chooses a level of work effort to provide. In one condition, workers are randomly matched to one of the two employers, as in the traditional set-up of gift-exchange games and other similar experiments using bilateral matching. We call this condition 'non-competition' (NC). In the other treatment, workers can choose which of the two employers they want to work for. We call this condition 'competition' (C). The employer that is not randomly matched to or chosen by the worker earns nothing in that round.

At the beginning of each session a hard copy of the instructions is made available to each player and is read aloud by the experimenter, in an attempt to make all options and payoffs of employer, worker and charity common knowledge to all players[6]. Participants can also refer to the instructions and the payoffs formulae throughout the session. A summary of the payoffs formulae is shown in Table 1. Further, in every round workers are allowed to choose different employers (in the competition condition) and levels of effort and see what the outcome of that choice would be before confirming it and moving to the next round.

TABLE 1. Payoffs of players

Payoff Employer	$\pi_p = (100\% - CSR) \cdot (E - w) \cdot e$
Payoff Worker	$\pi_a = w - c(e)$
Payoff Charity	$\pi_c = CSR \cdot (E - w) \cdot e$

[6] A copy of the instructions is provided in a separate Appendix.

To avoid heterogeneity in knowledge and experience with the charity, we chose a not well-known national charity[7]. Subjects were given a one page description about the mission of the charity and were also told that donations were made by the experimenters on behalf of all participants as a sum of all donations raised during the session, hence reducing possible social signaling and warm glow from giving (Andreoni, 1990; Benabou and Tirole, 2006). However, the amount of money received by the charity, as shown in Table 1, is affected by the decisions of both the employer and the worker. Exerting effort has a non-linear cost *c(e)* for workers which is deducted from the wage offer of the randomly matched or chosen employer, according to Table 2. The effort chosen by the worker affects both employer and charity payoffs according to the functions in Table 2.

TABLE 2. Cost of effort

Effort level *e*	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Cost of effort *c(e)* ECU	0	0	1	2	4	6	8	10	12	15	18

After answering a series of comprehension questions to make sure all participants understood the instructions correctly[8], players are randomly allocated to be either employer or worker and stay in the allocated role for the duration of the experiment – that is, 10 rounds. We implement a stranger design to avoid reputation effects: at

[7] The chosen charity was the Australian 'Cure Brain Cancer Foundation'. Across all sessions, 85% of subjects reported not having heard of the charity before and 94% never made a donation to the charity before the experiment.

[8] Participants answered on average 87% of questions correctly. A survey at the end of the experiment shows that 97% of participants found the instructions easy to understand and 96% thought the options available to them in the experiment were easy to understand.

the beginning of each of the ten rounds, all players are reminded that in the following round they will be randomly regrouped with two different players.

Participants in each session were further divided into matching groups, consisting of half of the employers and half of the workers in the room on each session. For example, if a session had 18 subjects in total, participants were randomly split into two groups consisting of 6 employers and 3 workers each that would interact with each other for the whole game. Participants were not told of the matching groups, nor which subjects belonged to which group, and did not know what role was played by any other subject in the room. After the last round, subjects answered a short questionnaire about themselves and their experience in the experiment.

Each session lasted approximately 60 minutes. Points earned in ECU were then converted to Australian dollars at an exchange rate of 0.05AUD/ECU and participants were paid in cash for all rounds depending on the outcome of their choices plus an additional AUD$5 show-up fee. The experiment was conducted at the Behavioural Computer Lab of the University of Sydney, Australia, between April and May 2016, for a total of eight sessions with 108 participants. In each of the two conditions, there were three sessions with n = 12 participants and one session with n=18 participants. A summary of the demographic characteristics of participants across the two conditions is provided in the Appendix. Participants were not statistically different between the two conditions on any observable characteristic. The experiment was conducted using z-Tree (Fischbacher, 2007) and participants were recruited using ORSEE (Greiner, 2015). On average subjects earned AUD$ 17.

B. Results

In this section we present the results of the experiment and discuss possible explanations for the observed behaviour, both at the individual and group level (i.e.

a triad of two employers and one worker in each round). We first analyze employers' behaviour between the competition (C) and non-competition (NC) treatments. Table 3 summarizes the key variables being discussed in this section. On average, wage offers of both employers and paired employer were higher in the competition condition than in non-competition, whilst CSR was higher in the non-competitive scenario but approximately the same between paired[9] and unpaired employer in the competition setting.

TABLE 3. Descriptive Statistics of Wage and CSR variables

ECU	***Competition***			***Non-competition***	
	Obs.	Mean	Std. Dev.	Mean	Std. Dev.
Average wage offer (both employers)	180	65.52	15.70	50.49	16.56
Average CSR (both employers)	180	13.46	12.41	15.72	14.83
Wage offer paired employer	180	73.12	16.14	51.50	22.66
Wage offer unpaired employer	180	57.87	19.79	49.60	24.77
CSR paired employer	180	13.92	16.34	16.72	22.77
CSR unpaired employer	180	13.04	19.05	14.73	20.59

A closer look at earnings by group level suggests that the charity was better off in the non-competitive scenario, whilst workers earned significantly more in the competitive setting, and employers earned similar amounts in both conditions (a similar table breaking down earnings by experimental session is provided in the Appendix, showing similar results).

[9] We use the term 'paired employer' to refer to employers that were either randomly matched to the worker in the NC setting and the employer chose by the worker in the C setting.

TABLE 4. Descriptive Statistics by Groups[10]

ECU	***Competition***			***Non-competition***		
Group	Average Employers Earnings	Average Workers Earnings	Average Charity Earnings	Average Employers Earnings	Average Workers Earnings	Average Charity Earnings
1	8.70	54.85	2.45	8.10	43.25	16.20
2	6.33	67.35	0.95	4.63	47.70	9.25
3	2.87	70.47	5.73	4.13	48.93	8.27
4	2.00	72.65	4.00	2.38	52.40	4.75
5	1.80	63.20	2.15	1.40	38.50	2.80
6	1.53	82.15	3.05	1.30	51.35	2.60
7	0.87	71.60	1.73	0.67	45.97	1.33
8	0.55	66.20	1.10	0.05	48.85	0.10
Average	**2.99**	**68.56**	**2.65**	**2.83**	**47.12**	**5.66**

Wage Settings and Social Incentives. – Figure 1 shows the average wage offer of both employers over ten rounds between the two conditions. On average, employers in both conditions offered mostly wages that were above the minimum amount (i.e. 20 ECU). Wage offers started higher in the competitive treatment, with average wage across the two employers in round 1 being 51.6 in competition (C), against an average of 41.8 in non-competition (NC), with this difference being statistically significant ($p < 0.001$ Wilcoxon rank-sum test, with subject as unit of observation). The average wage offer increased in both conditions over the first four rounds, remaining higher in the C than NC condition after that. While the wage offers continued to increase in competition, they fell slightly during the final 6 rounds in

[10] Groups are listed in order of employers' earnings, from highest to lowest in competition and non-competition respectively

the non-competitive condition. In the competitive condition, wages increased from an average of less than half of an employer's endowment to almost two thirds. Average wage offer across employers in the competition treatment increased to almost 50% more than in the non-competition treatment by the end of the ten rounds ($p < 0.01$, Wilcoxon rank-sum test, with group as unit of observation)[11]. Error bars refer to standard error around the mean for each period.

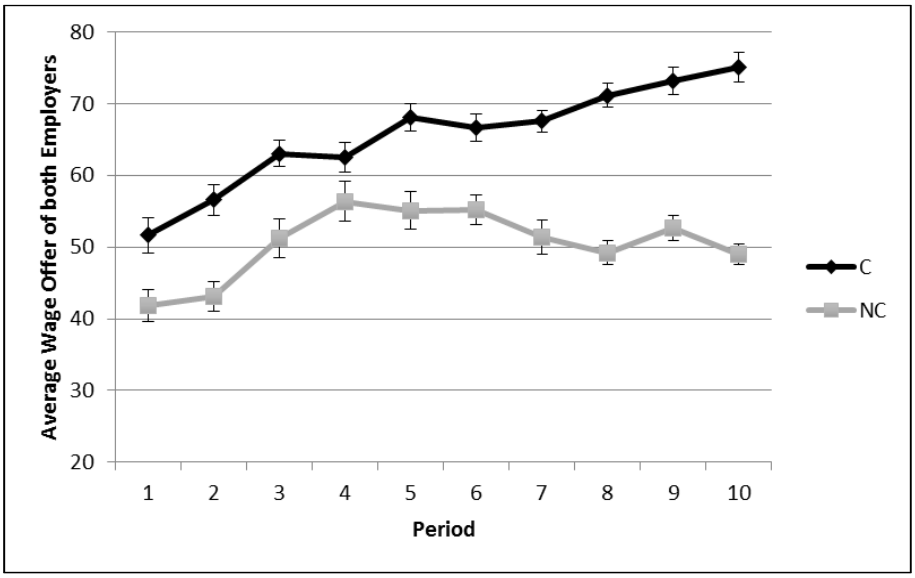

FIGURE 1. Average wage offer of both employers per period

Similarly, we plot average CSR in both conditions over ten rounds. Here a value of 10 on the y-axis corresponds to 10% of profits being donated to charity by the employer, a value of 15 is equal to 15% of profits donated to charity and so on. Figure 2 shows that CSR starts lower and increases over time in the competition

[11] Two-sample Wilcoxon rank-sum test shows that the probability that the average wage in the competition treatment is higher than the average wage in the non-competition treatment over all rounds is 75.2% ($p < 0.01$).

condition, but it remained almost constant in the non-competitive condition. Whilst employers can choose to donate to charity any percentage of profits they want, from 0% to 100%, on average most employers chose to donate more than 0% but they rarely exceeded 20% of potential profits[12].

The test that CSR is higher in the competition treatment than in the non-competition treatment is not significant neither in the first round (p = 0.109, Wilcoxon rank-sum test, with subjects as unit of observation) nor over all rounds (p = 0.172, Wilcoxon rank-sum test, with group as unit of observation).

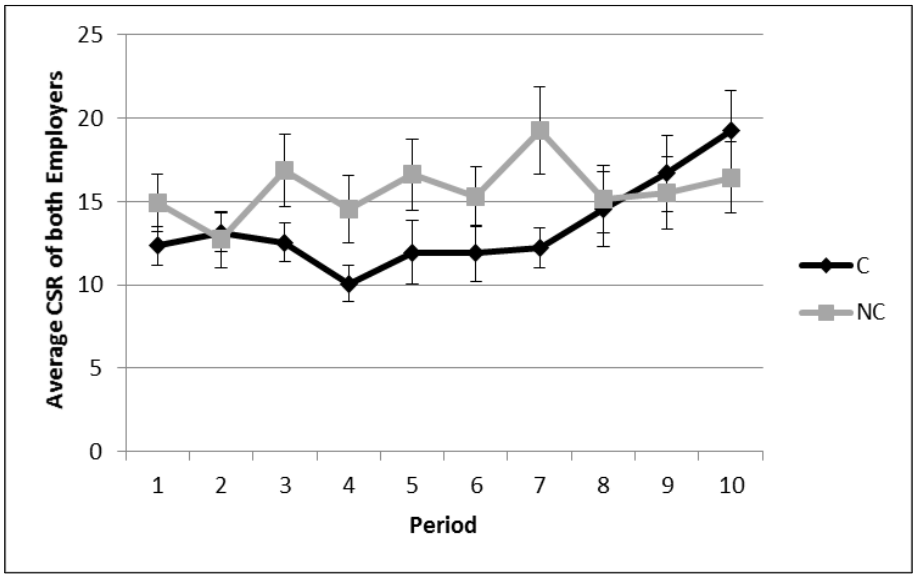

FIGURE 2. Average CSR offer of both employers per period

As in other standard gift exchange games where one employer and one worker are paired bilaterally, we look at the specific relationship between worker and the

[12] Employers chose to donate more than 20% of their potential profits to charity 14% and 23% of times in competition and non-competition conditions respectively.

paired employer (i.e. the employer chosen by the worker in the competition treatment and the randomly matched employer in the non-competition treatment).

Figure 3 plots the average wage offer of the paired employer only. It can be seen that the differences between the two conditions – competition and non-competition – are remarkable. In the competitive condition, employers start with an already higher average wage, which increases steadily over time, whilst in non-competitive environment it starts lower and remains more constant over time. Overall, the average wage offer of the paired employer is significantly higher in competition than in non-competition (Mann-Whitney test: $p < 0.05$, and Wilcoxon rank-sum test: $p < 0.05$, group as unit of observation). The average difference across the ten rounds is 21.6 ECU, from a minimum of 15.3 in round 2 to a maximum of 29 ECU in round 8.

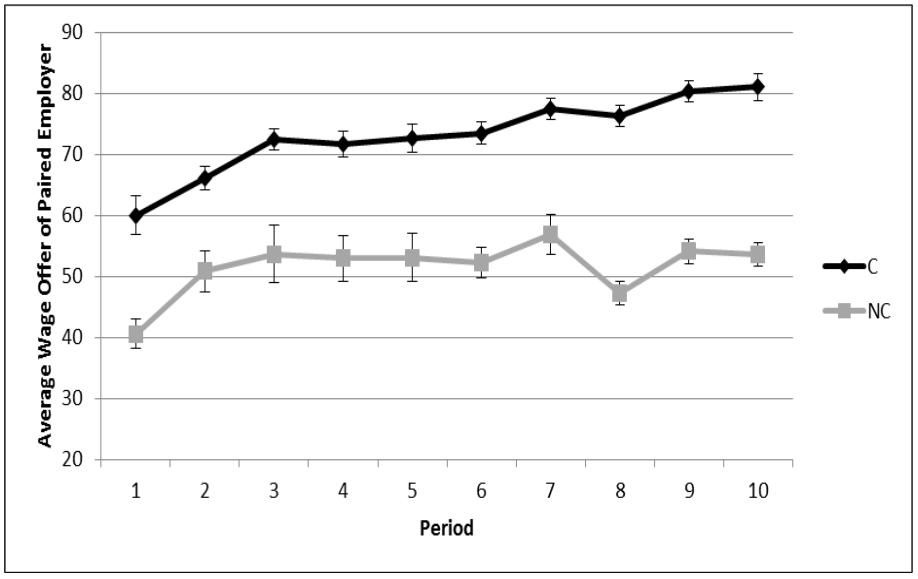

FIGURE 3. Average wage offer of paired employer per period

The same analysis is presented for the CSR in Figure 4. Here the differences between the two conditions are less visible across rounds and are not significant (p = 0.59, Mann-Whitney test, with group as unit of observation).

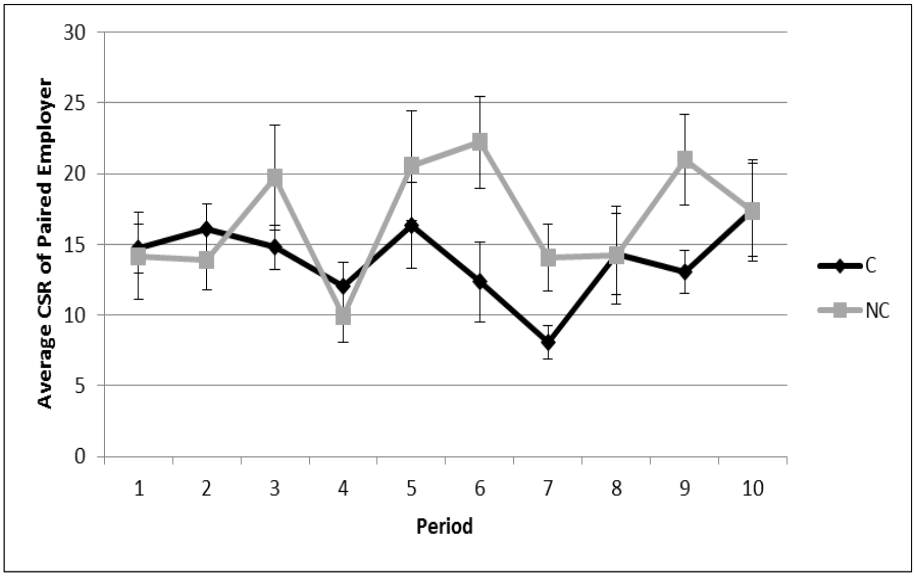

FIGURE 4. Average CSR of paired employer per period

Financial and Social Incentives in a Competitive Environment – We now examine whether the increase in wages (but not CSR) over time in the competitive but not in the non-competitive condition can be explained by the workers' ability to select their employer. Over all rounds, when the two employers chose different wages (n=158), employees selected the employer who offered the higher wage 87% of the time. Figure 5 shows that average wage of the chosen employer was consistently above the wage of the not chosen employer, both increasing over time, consistent with the hypothesis that employers competed on higher wages to attract workers.

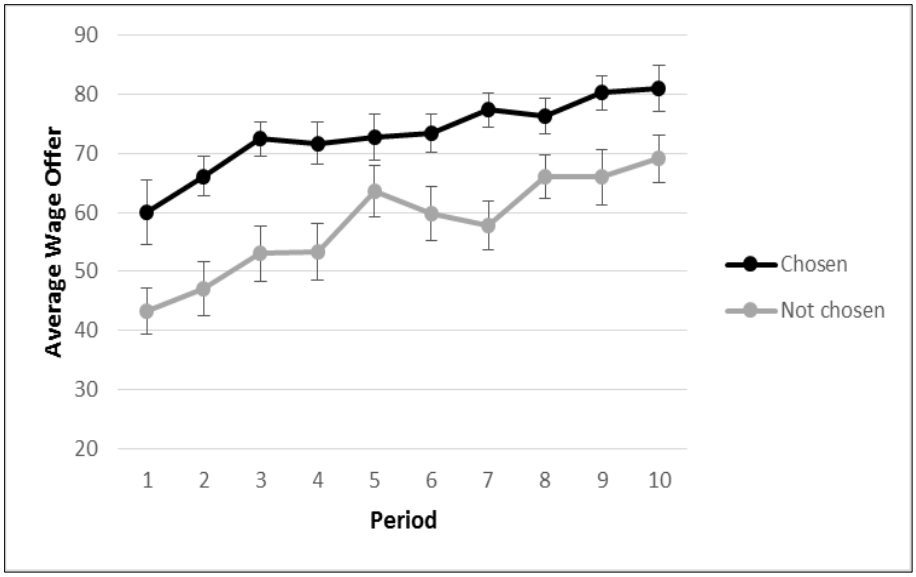

FIGURE 5. Average wage offer of chosen and not chosen employer in the competition treatment

CSR levels differed between employers in the competitive condition 78% of the time (142 out of 180), with the employer offering a higher CSR being chosen 60% of times. In the competitive setting, employers chose the same wage offer 22 times out of 180 (12% of times). Of these 22 times when wage offers were identical, 6 times CSR levels were identical. Of the remaining 16 times when wage offers were identical and the CSR offer differed, workers chose the employer that donated more to charity 15 times; i.e. 94% of the time when employers offered the same wage but different CSRs, a worker chose the employer with the higher CSR.

Overall, this evidence suggests that employers competed more aggressively on wages, with CSR being critical to break ties in wage offers. Given wage offers were not commonly identical, and thus CSR played only a small role in determining the employer chosen, it is not surprising that the difference across CSR levels between chosen and not chosen employers is not large, as shown in Figure 6.

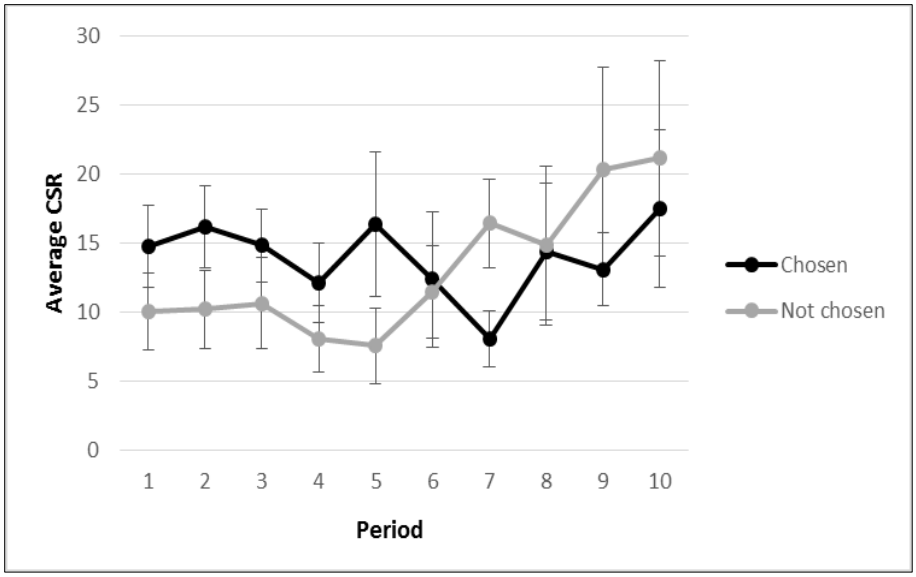

FIGURE 6. Average CSR of chosen and not chosen employer in the competition treatment

To estimate whether these effects are statically significant, we run a series of regressions, starting with the following model to study the effect of wages and CSR on the probability of an employer being chosen:

(1) $$\Pr(Y_i = 1) = \beta_1 \, Higher\ Wage_i + \beta_2 \, Higher\ CSR_i + \\ + \beta_3 \, Higher\ Wage_i * Same\ CSR_i + \beta_4 \, Higher\ CSR_i * Same\ Wage_i + u_i$$

The dependent variable is a binary dummy that assigns a value of 1 or 0, with 1 if the employer was selected. The independent variables are also a series of binaries with values of 1 when the selected employer offered a higher wage or a higher CSR than a competitor (β_1 and β_2 respectively), or the same wage and CSR and vice versa, covering all possible combinations. We cluster standard errors at the matching group level since subjects interacted throughout the experiment with the

same subjects within their matching group. The estimates from the Probit regression in Table 5 indicate that both higher wages and higher CSR increased the probability of an employer being chosen in a competitive environment, with wages having a significantly larger effect. Similarly, offering a higher CSR when wage offers were identical increased the probability of an employer being selected.

TABLE 5. Determinants of Employer Choice in Competition

	(1)	(2)	(3)	(4)
Constant	-2.091***	-2.122***	-1.362**	-1.373**
	(0.475)	(0.502)	(0.599)	(0.637)
Higher Wage	2.605***	2.395***	2.301***	2.168***
	(0.317)	(0.367)	(0.392)	(0.444)
Higher CSR	1.353***	1.366***		
	(0.102)	(0.0791)		
Higher Wage * Same		0.894		0.678
CSR		(0.589)		(0.519)
Higher CSR * Same			6.792***	6.873***
Wage			(0.604)	(0.612)
Pseudo - R^2	0.4564	0.4696	0.4737	0.4811
Cluster SEs	Yes	Yes	Yes	Yes
Round dummies	Yes	Yes	Yes	Yes
Observations	180	180	180	180
$\beta_1 = \beta_2$	$X^2 = 33.88$	$X^2 = 12.75$		
	$p < 0.0001$	$p < 0.0001$		
$\beta_1 = \beta_4$			$X^2 = 274.74$	$X^2 = 30.81$
			$p < 0.0001$	$p < 0.0001$

(1) to (4) Probit models; Robust standard errors clustered around matching groups.

*** p<0.01; ** p<0.05; * p<0.1.

RESULT 1. *Employer selection was driven by higher wages and higher CSR, with higher wages having a larger effect (H3a)*

RESULT 2. *Under equal wage offers, higher CSR drove employer selection (H3b)*

This result is in line with other studies in the charitable giving context that suggest that altruism can operate as a social signal. A recent paper by Fehrler and Przepiorka (2013) for instance shows that altruism can increase the chances of being selected as a partner in other common laboratory games.

Wage Determination – We are now interested in understanding how wages get determined and change over time across conditions. To achieve this goal we run a linear regression on the average wage offer of both employers against a dummy for competition, round dummies and interaction terms of round and competition dummies, clustering at the matching group level.

TABLE 6. Effect of Competition on Wage and CSR Determination

	Average Wage	Average CSR
	(1)	(2)
Constant	41.81*	14.94*
	(3.568)	(2.341)
Competition	9.861*	-2.583**
	(0.999)	(0.200)
Round 2	1.306	-2.222
	(5.223)	(0.571)
Round 3	9.472*	1.917

	(1.399)	(2.712)
Round 4	14.53	-0.417
	(7.621)	(1.399)
Round 5	13.25	1.667
	(6.479)	(1.142)
Round 6	13.36	0.333
	(9.448)	(1.770)
Round 7	9.611	4.306***
	(5.024)	(0.0285)
Round 8	7.361	0.194
	(4.824)	(2.255)
Round 9	10.86	0.583
	(5.623)	(4.253)
Round 10	7.167	1.472
	(3.882)	(3.340)
Round 2*Competition	3.583	3
	(8.763)	(1.313)
Round 3*Competition	1.861	-1.722
	(4.367)	(2.569)
Round 4*Competition	-3.694	-1.889*
	(11.67)	(0.171)
Round 5*Competition	3.167	-2.083
	(2.455)	(2.940)
Round 6*Competition	1.611	-0.806
	(4.967)	(5.737)
Round 7*Competition	6.278	-4.444
	(3.539)	(1.884)
Round 8*Competition	12.11	2
	(3.539)	(9.819)
Round 9*Competition	10.58	3.750

	(1.855)	(13.84)
Round 10*Competition	16.19*	5.444
	(1.284)	(9.648)
R^2	0.289	0.031
Cluster SEs	Yes	Yes
Observations	360	360

*** p<0.01; ** p<0.05; * p<0.1. Robust standard errors clustered around matching groups. We group all triads in one round to create one observation – that is, two employers and one worker randomly grouped together in one round, leading to $n = 360$.

From Table 6 we can see that the presence of competition significantly increased the average wage offer over time (as shown by coefficients of the interaction terms of competition dummy with rounds, specially comparing the first 5 and second 5 rounds), whilst CSR decreased, supporting the hypotheses that employers competed more aggressively on wage offers than CSR. Likewise, the goodness of fit of the regression on average wage does a better job at explaining the relationship with competition compared to average CSR.

RESULT 3. *The two conditions exhibit significant differences with respect to average wages: higher wages occurred in the competitive condition and they increased significantly over time, but not in the non-competitive condition (H1).*

RESULT 4. *There is not a significant difference on average CSR with respect to the conditions and they exhibit similar steady patterns over time (H2).*

To test if competition for being chosen drives higher wages over time, we introduce an interaction term of lagged higher wage offered by a competitor in the previous round[13].

TABLE 7. Wage and CSR Determination[14]

	Wage Offer Employer 1		CSR Offer Employer 1	
	(1)	(2)	(3)	(4)
Constant	56.44*	53.65*	14.22	15.42
	(7.642)	(5.446)	(5.687)	(7.170)
Competition	-2.950	-1.636	-4.760	-5.420*
	(10.88)	(7.485)	(6.287)	(0.822)
Wage offer of Employer 2 on previous round	-0.0973	-0.107		
	(0.0835)	(0.0855)		
Wage offer of Employer 2 on previous round * Competition	0.335	0.333		
	(0.0917)	(0.0715)		
CSR offer Employer 2 on previous round			0.0924	0.0898
			(0.0414)	(0.0351)
CSR offer Employer 2 on previous round * Competition			-0.103	-0.106
			(0.0508)	(0.0598)
Round 2	-11.93***	-9.291*	0.764	-1.326
	(0.140)	(0.927)	(1.103)	(3.871)
Round 3	-4.317	-2.780	2.821*	1.434
	(0.943)	(4.499)	(0.323)	(3.604)
Round 4	0.482	9.233	0.518*	-0.296
	(1.405)	(11.87)	(0.0668)	(4.402)
Round 5	1.737	5.366	5.332	6.513
	(4.620)	(4.187)	(2.603)	(2.441)
Round 6	1.742	6.719	-	-
	(6.656)	(11.33)		
Round 7	-1.629	1.612	6.335	8.858
	(1.720)	(4.323)	(1.528)	(5.325)
Round 8	0.901	2.900***	2.682	0.0285
	(0.448)	(0.000638)	(1.746)	(0.265)
Round 9	2.066	4.865	5.777	2.686
	(3.185)	(0.944)	(1.677)	(6.421)
Round 10	-	-	8.288	4.138
			(2.065)	(1.780)
Round 2*Competition		-		2.548
				(3.125)

[13] We use the denomination Employer 1 and 2 to simply distinguish between two different employers

[14] Round 1 variables were treated as missing observations

Round 3*Competition		2.262		1.142
		(8.600)		(0.779)
Round 4*Competition		-12.04		-
		(18.53)		
Round 5*Competition		-1.796		-4.010
		(3.394)		(1.541)
Round 6*Competition		-4.428		-1.649
		(6.581)		(8.602)
Round 7*Competition		-0.995		-6.665
		(2.598)		(1.148)
Round 8*Competition		1.507		3.671
		(3.497)		(12.70)
Round 9*Competition		-0.122		4.563
		(7.225)		(18.16)
Round 10*Competition		5.550		6.679
		(2.743)		(8.119)
Cluster SEs	Yes	Yes	Yes	Yes
Observations	324	324	324	324
R^2	0.206	0.2161	0.034	0.042

(1) to (4) OLS; Robust standard errors in parentheses (clustered on matching group). *** p<0.01, ** p<0.05, * p<0.1
Omitted variables for rounds are due to perfect collinearity

The parameters from model (2) in Table 7 show that in competition the wage offered by the other employer in a previous round has a positive effect on increasing wage offered by the observed employer, but this effect was not significant (p = 0.135. Similarly, in competition observing the CSR level chosen by the other employer has a negative effect on the level of CSR that the observed employer will choose in the subsequent round, although this was also not significant (p = 0.238).

One explanation of these results can be that employers might have adapted their wage offers and CSR levels based on the expected response from workers, rather than based on what other employers were doing in the game.

Gift Exchange and Reciprocity – We now analyse the behaviour of the workers. Figure 7 shows the average work effort, mostly positive in both competition and

non-competition conditions (higher than zero 93% and 87% of times in competition and non-competition respectively)[15]. Figure 7 suggests that there is no substantial difference between workers' unconditional behaviour in competition and non-competition, being positive in both cases. Nonetheless, employers may be able to induce higher levels of efforts from workers (and encourage selection in the competition condition) by varying their wage offer and CSR levels.

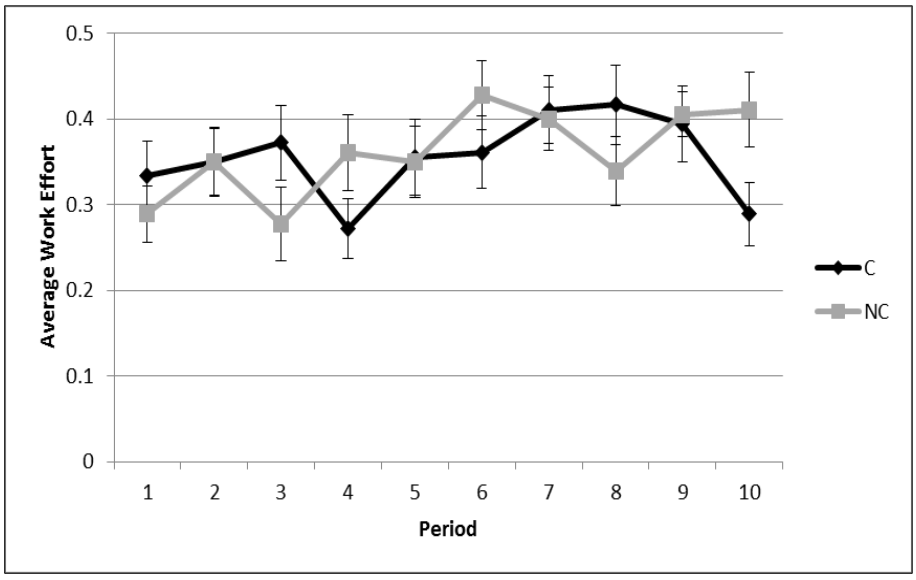

FIGURE 7. Average work effort between conditions

To understand how these two variables affect worker's effort in both conditions, we plot effort against the wage offer and CSR of the paired employer (i.e. the chosen or randomly matched employer). To better visualise the relationship of these variables we also plot a line of fitted values with a 95% confidence interval. Because we are interested in studying reciprocity in terms of how a level of work effort chosen by the worker affects outcomes for the employer, we remove the few

[15] In our setting workers can choose a value of 0 and still keep the full amount of money from the offered wage

observations when employers offered a wage of 120 ECU, since no matter what the level of effort the worker would choose, this would lead to no earnings for the employer. This led to 4 and 3 observations being dropped in non-competition and competition respectively.

Figures 8 and 9 below show that the relationship between employers' wage offer and CSR on workers' effort is similar to previous gift exchange game experiments. In the competitive condition, however, when workers can choose the employer, we see what appears to be a somewhat weaker effect of wages and CSR on effort (Figures 10 and 11).

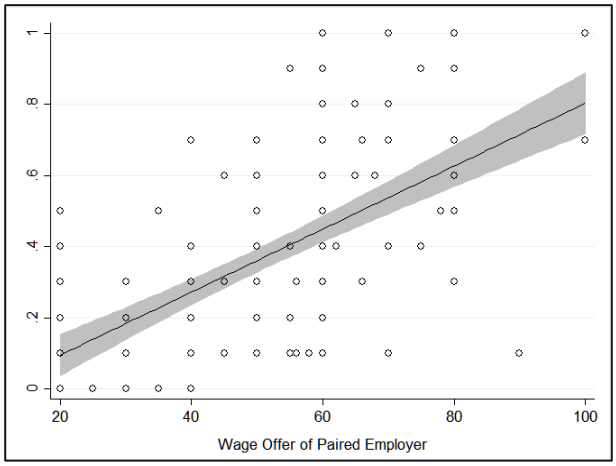

FIGURE 8. Work effort as a function of wage offer in non-competition condition

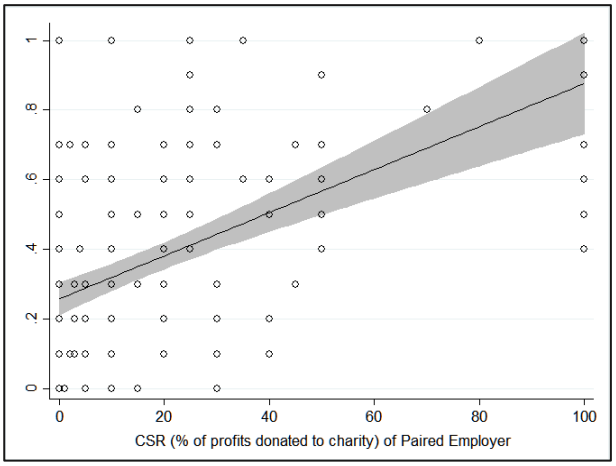

FIGURE 9. Work effort as a function of CSR in non-competition condition

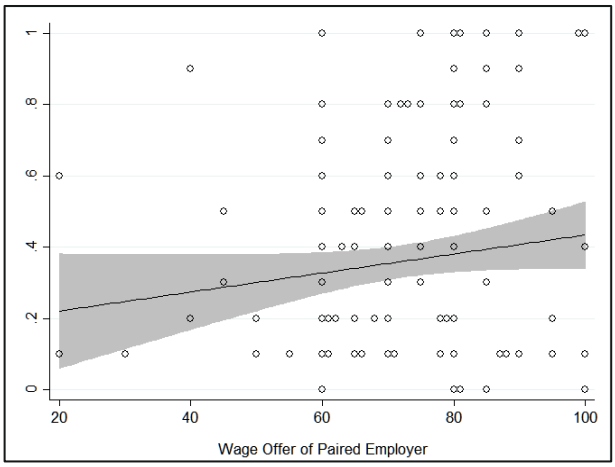

FIGURE 10. Work effort as a function of wage offer in competition condition

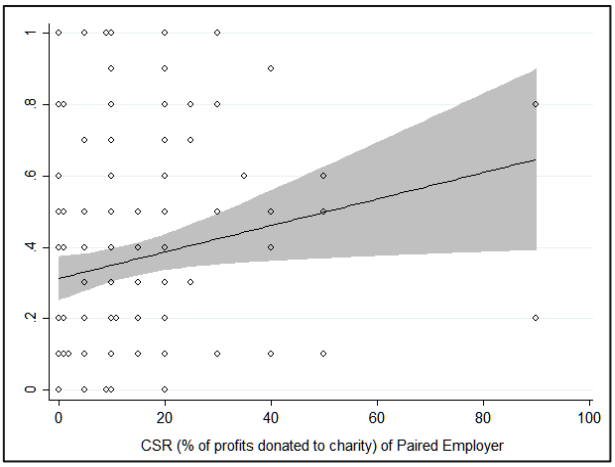

FIGURE 11. Work effort as a function of CSR in competition condition

To examine the presence of a gift exchange, we first look at the probability of a worker providing positive effort as wage offer and CSR of the paired employer increase. To achieve this goal, we create a dummy variable for gift exchange that gets a value of 1 when the level of chosen work effort is positive, and regress it against wage offer and CSR of the paired employer only[16]. Results from Table 8 show that wage offer and CSR have a positive effect on increasing the probability that the worker will reciprocate and provide positive levels of effort. The presence of competition, however, has a negative effect on the probability of seeing gift exchange. This can be seen both by the competition dummy in model (1) and the interaction term with wage offer in model (2). Models (3) and (4) provide estimates on the marginal probability of each independent variable, showing that both wage and CSR are effective at increasing the probability of workers reciprocating, but

[16] To regress positive work effort against wage offer and CSR of the paired employer, we group triads in one round to create one observation – that is, two employers and one worker randomly grouped together in one round. This reduces our observations to n = 360 in total, equally split between the two conditions. We then remove 7 observations where the paired employer offered a wage equal to 120 ECU as previously explained in the text.

wage offer has a substantially higher marginal probability compared to CSR. Similarly, the presence of competition negatively affects the probability of a worker reciprocating, as shown by the interaction term of wage offer and competition dummy in model (4).

TABLE 8. Probability of Gift Exchange

Gift Exchange (binary 0 or 1)				
Paired Employer	(1)	(2)	(3)	(4)
Constant	-0.241	-1.884***		
	(0.879)	(0.116)		
Competition dummy	-0.300***	4.534***	-0.0329	0.600**
	(0.0341)	(0.977)	(0.0218)	(0.239)
Wage	0.0245	0.0742***	0.00268***	0.00384***
	(0.0169)	(0.00764)	(0.000364)	(0.00138)
CSR	0.0341***	0.0317*	0.00372***	0.00164***
	(0.0117)	(0.0188)	(0.000781)	(0.000550)
Wage * Competition		-0.0933***		-0.00483*
		(0.0248)		(0.00253)
CSR * Competition		0.00145		0.000075
		(0.00383)		(0.000179)
Observations	353	353	353	353
Pseudo- R^2	0.1835	0.3336	0.1835	0.3336

(1) and (2) Probit, (3) and (4) Marginal Probit (dprobit). *** p<0.01; ** p<0.05; * p<0.1. Robust cluster standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Our second measure of gift-exchange is the slope of the effort in response to higher wages and higher CSR. Table 9 reports the results of a regression where effort is now a continuous variable, going from 0 to 1.

TABLE 9. Determinants of Gift Exchange

Work Effort (continuous 0 to 1)		
Paired Employer	(1)	(2)
Constant	-0.267***	-0.244***
	(0.00156)	(0.0506)
Competition dummy	0.334	0.533***
	(0.273)	(0.0593)
Wage	0.0103***	0.0100***
	(0.00127)	(0.00124)
CSR	0.00562***	0.00413***
	(0.00109)	(0.000121)
Wage * Competition	-0.00704***	-0.00740***
	(0.00268)	(0.000663)
CSR * Competition	-0.00107	-0.00362
	(0.00154)	(0.00228)
Worker dummy	No	Yes
Observations	353	353
Pseudo - R^2	0.4103	0.5444
Wage + Wage*Competition = 0	F(1, 348) = 0.67	F(1, 315) = 1.88
	p = 0.4138	p = 0.1716

Tobit with (1) 34 left-censored and 19 right censored obs.; (2) 34 left-censored obs. Worker Dummies are dummy variables for each worker to account for different levels of reciprocity among subjects assigned to the role of worker. *** p<0.01; ** p<0.05; * p<0.1. Robust (cluster) standard errors in parenthesis

Table 9 almost mirrors the results from Table 8, suggesting that wage offer and CSR have a positive effect not only at increasing the probability that the worker will reciprocate, but also by increasing the actual level of work effort provided by the worker. Again the interaction term with competition shows that when workers can choose their employer, they tend to reciprocate less and provide lower levels of effort. Further, the negative effect of competition on reciprocity is robust to the introduction of worker-specific characteristics by including worker dummies in the Tobit model (2). An F-test also shows that a wage offer plus the interaction term wage offer by competition is not statistically significant. This result might suggest that gift exchange can be observed mainly in a setting without competition, as in a

standard laboratory setup. When a sorting mechanism is introduced, workers reciprocate less. This can be explained by the fact that workers might perceive they have already reciprocated the employer by choosing her over a competitor, hence feeling less the pressure or need to reciprocate again by providing higher levels of effort. Likewise, employers might increase wages in a competitive environment to attract workers first, rather to expect induced higher level of effort. This results can also help explain why there is some discrepancy between lab and field experiments observing gift exchange (see List, Gneezy, 2007 for example).

RESULT 7 – *As wage offer and CSR increase, workers increase effort but more in the non-competition conditions (as in other gift-exchange games) (H4a).*

RESULT 8 – *Higher wages are marginally more effective than CSR at increasing both the likelihood of a worker reciprocating and the level of effort provided (H4b).*

RESULT 9 – *The presence of employer competition negatively affects the likelihood of workers reciprocating the employer as well as the magnitude of the level of effort provided (H5)*

To visually see this, we first group wage offer of the paired employer by three groups: low (when wage offer is between 20 and 59 ECU); medium (60 to 99 ECU); and high (100 to 120 ECU). Plotting the average work effort across all workers we can see that, on average, in both conditions a low wage is met with a very low level of work effort (Figure 12). In the competitive environment, however, marginal increases in wage offers do not seem to lead to higher levels of effort. This suggests that that gift exchange is lower in a competitive environment. We plot the same relationship for CSR at three different levels (0-39%; 40-79%; and 80-100%) against average work effort (Figure 13).

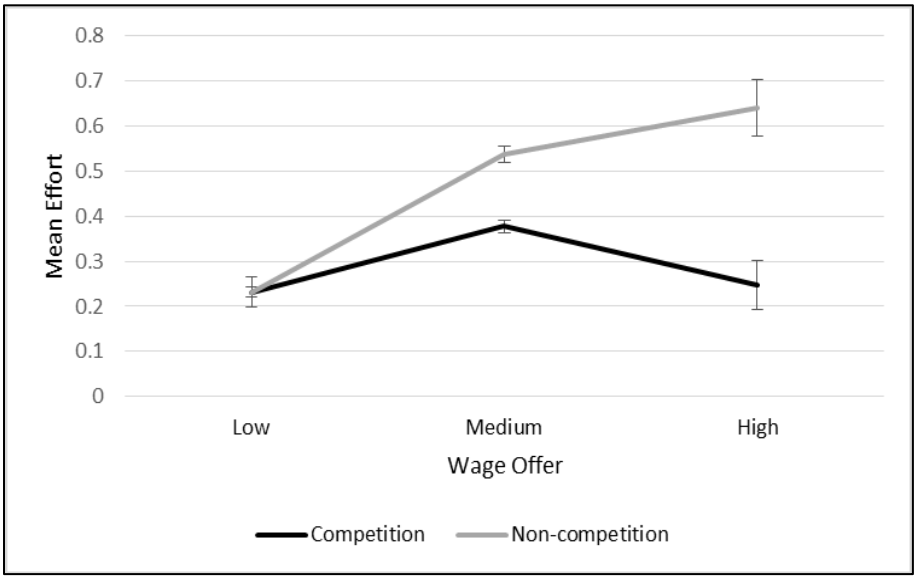

FIGURE 12. Average work quantity as a function of low, medium and high wage offer of paired employer in both conditions

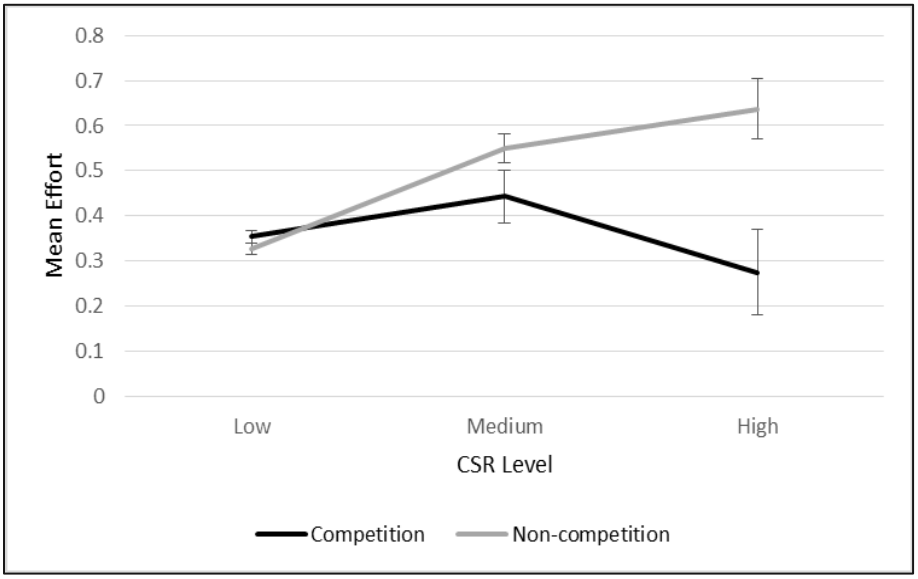

FIGURE 13. Average work quantity as a function of low, medium and high CSR of paired employer in both conditions

The line graphs of Figures 12 and 13 seem to suggest that competition decreases the average level of work effort as wages and CSR increase. This difference is indicative of the direction of impact of sorting in otherwise identical experimental setting. Without the competition, average work effort is comparable to previous gift exchange game experiments, whilst competition decreases the average work effort from 0.47 to 0.28 (across all rounds). A very similar effect of competition on work effort is observed also for CSR, decreasing from an average of 0.5 in the non-competition treatment to an average of 0.35 in the competition treatment.

IV. Discussions and Conclusions

In this study we implemented a modified gift-exchange game in the laboratory to test the impact of financial and social incentives to attract and motivate workers. In our game, employers can use their initial endowment to make a wage offer to the worker and choose a level of potential profits they want to donate to charity, as a form of Corporate Social Responsibility (CSR). To account for self-selection into preferred labour contracts, we ran a treatment condition with a sorting mechanism, where workers can choose between two employers in every round.

We find that employers that offer the higher wage are significantly more likely to be chosen by workers, and as a result wages increase dramatically in the competitive setting. Offering a higher CSR can get an employer to be selected over a competitor, but only when their wage offers are identical. Our results also show that higher wages have a significantly higher effect in inducing worker's effort compared to CSR. This suggests that, in contrast with previous studies and surveys based on self-reported measures of job preferences, especially among graduates, social incentives can operate as a social signal of altruism to attract workers only when wage offers are identical to other competitors.

In line with previous studies, we find evidence of reciprocity, but the introduction of a sorting mechanism decreases both the likelihood of a worker to provide positive levels of effort and the level of effort itself. This suggests that the gift exchange may be much weaker (or even non-existent) when there is an excess demand for worker's labor supply than in past studies that have explored either excess supply or an equal labor supply and demand. To better study the impact of competition on wage offers and reciprocity, we returned to the lab with the same modified gift-exchange game, but this time without the presence of CSR. At the end of chapter 2 we discuss the findings of the four treatments taken all together.

Appendices

A. Demographic Characteristics

	Competition			***Non-competition***			
Characteristic	Mean	%	SD	Mean	%	SD	*p*-value
Female	30	56%	0.50	30	56%	0.50	0.50
Age	24	44%	4.37	25	46%	5.64	0.34
Undergraduate	40	74%	0.44	35	65%	0.48	0.15
Major Econ or Business	27	50%	0.50	22	41%	0.50	0.17
Liked the Charity	20	37%	0.49	25	46%	0.50	0.05
At least one donation in past year	43	80%	0.41	43	80%	0.41	0.50
Low Generosity	15	28%	0.45	11	20%	0.41	0.19
Medium Generosity	22	41%	0.50	21	39%	0.49	0.42
High Generosity	5	9%	0.29	12	22%	0.42	0.03
High Disposable Income	15	28%	0.45	10	19%	0.39	0.13

p-values are calculated with a Wilcoxon-Mann-Whitney test, with subjects as unit of observation.

B. Descriptive Statistics by Session

ECU	***Competition***			***Non-competition***		
Group	Average Employers Earnings	Average Workers Earnings	Average Charity Earnings	Average Employers Earnings	Average Workers Earnings	Average Charity Earnings
1	7.93	73.95	3	8.28	44.6	3.72
2	6.94	69.2	2.07	10.16	47.25	4.37
3	9.36	64.72	3.97	9.80	49.4	4.02
4	8.44	65.82	2.57	10.76	49.25	7.77
5	5.25	76.1	1.1	17.6	38	13.4
6	10.71	68.1	2.2	16.25	48.8	7.2
Average	**8.15**	**68.83**	**2.76**	**10.55**	**47.15**	**5.56**

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CHAPTER 2

Reference-Wage Effect and Motivation when Labour Demand Exceeds Supply: Evidence from a Gift Exchange Game with Sorting

In this paper we examine gift exchange in an experimental labour market with an excess of labour demand. We implement a modified version of the gift exchange game where two employers and one worker are randomly grouped together in every round. In one condition we introduce a sorting mechanism to allow workers to choose their preferred employer in every round. Unsurprisingly, workers always choose the employer offering the higher wage but the presence of competition negatively affects the level of effort provided, supporting findings from Chapter 1 of this thesis that workers already reciprocate a higher wage by choosing an employer over another. In the other condition of our experiment, where workers are randomly matched to one of the two employers without being able to choose, we find evidence of a reference-wage effect: when workers are randomly matched to the employer offering a higher wage, they provide higher levels of effort, ceteris paribus. In the last section of this chapter we compare results from the two experiments and show that in competition employers must offer significantly higher wages to attract and motivate workers, but that social incentives in the form of a portion of profits donated to charity, negatively affect employers' earnings. Our findings help reconcile the evidence from lab and field experiments examining gift exchange and contribute to the literature on reference-dependent bias.

The experimental economics labour market literature provides compelling evidence that gift exchange can operate as a cost-effective contract enforcement device. Driven by a sense of reciprocity, workers work harder when paid a 'fair wage'. This hypothesis was first proposed by Akerlof (1982) and Akerlof and Yellen (1990), then supported empirically by a lab experiment designed by Fehr et al. (1993), later known as the gift-exchange game. In a typical gift exchange game lab experiment, players are assigned the role of employer or worker and are randomly and bilaterally matched in every round. Studies examining the gift exchange game, with their numerous variations, found supporting evidence for the hypothesis that workers deviate away from monetary payoff-maximising behaviour and, despite no contractual clause forcing them to do so, provide higher effort (incurring higher costs) when paid a higher wage[17].

An often overlooked but important element of this theory is that the notion of 'fair wage' is strongly reference-dependent. In his seminal paper, Akerlof in fact used the definition of 'fair wage' and 'reference wage' almost interchangeably. In Akerlof's theory, the reference point used by workers to evaluate if their wages are 'fair' is what other similar workers earn. Based on Merton's (1957) theory of social comparison, Akerlof stated:

"*Using reference-individual-reference-group theory, the fairness of this wage depends on how other persons in the worker's reference set are similarly treated […] one argument of the perceived fairness of the wage will be the wages received by other similar workers. Such workers, of course, include workers who are employed; but, in addition, it includes workers in the reference set who are unemployed*." (Akerlof, 1982).

[17] A review of the gift exchange game literature is provided in Chapter 1 and will not be covered again here.

The notion of equity and inter-group reference point has been tested in a recent gift-exchange game in the lab by Abeler et al. (2010). In this experiment the authors group two workers with one employer on every round[18]. Each employer can set equal or different wages for the two workers randomly grouped with her. The authors find that under equal wages effort is lower, suggesting that some form of inequality might actually motivate workers to work harder. The authors argue that this behaviour can be explained by self-selection, and that different wages would allow more productive workers to sort themselves into the most appropriate wage for their preferred level of effort.

The reference point however might not be only what other similar workers earn but also what other employers might offer. In Akerlof's theory, firms are assumed to be homogenous, offering the same average wage; the 'alternative wage' is in fact considered to be the level of unemployment insurance, which other authors also argued would operate as a contract enforcement device (Shapiro and Sitligtz, 1984). A worker would then be expected to work harder when the employer offers a wage that is higher than the minimum wage for that job position, but also for fear of losing her job.

The role of employer competition, and in particular when there is excess labor demand, has been overlooked by both the experimental and non-experimental labour economics literature, which have been mostly focused on understanding how workers' characteristics affect hiring rates, wages and productivity, such as age, gender and ethnicity among others (Bertrand and Mullainathan, 2004; Leibbrandt et al., 2014). Less attention has been paid to the role of the employers, for example the way employers are chosen by worker and whether this might influence productivity and performance. It is possible in fact that even employers

[18] In the first gift exchange game, Fehr et al. (1993) also introduce an excess of labour supply, whilst many studies that followed used mostly a bilateral matching approach.

operating within the same industry or sector can be more or less successful than competitors in motivating workers to work harder.

In this paper we show that the wage offer of a competitor employer influences the level of effort provided by the worker as a reference point. A worker might evaluate her opportunity-cost between an existing offer and that of another employer, and choose a level of effort accordingly, which one can expect to be at least partially affected by the competing offer[19]. This situation is common across all labour markets, but can be particularly visible in professions where labour supply is lower than demand and employers must compete more aggressively to attract and motivate workers.

Reference Points – Reference points proved to affect behaviour in a number of ways (Kahneman et al. 1990). A key question explored by labour economics studies has been: "*what determines a reference point for a worker?*". Sometimes the reference point can be one's own level of income. DellaVigna et al. (2014) showed, for instance, how job seekers in Hungary increased job search activity after the introduction of a policy reducing their income support. The authors found that job seekers adapt their behaviour and lifestyle over time, hence changing their income reference point accordingly: those who did not find a job soon in fact returned to low levels of job search activity and simply reduced their consumption levels. This finding is in line with Camerer et al. (1997) that shows that cabdrivers in New York City set themselves a (loose) daily income target as a reference point and quit working once they reached that target[20]. In other settings where workers cannot

[19] Consider a worker who receives an outside offer for a higher amount. If the current employer makes a counter-offer to retain the worker, the effect on the worker's effort might depend on whether such counter-offer wage is below or above the outside offer. If below, the worker might perceive his firm's offer as less than fair, and hence provide less of a gift exchange response than if the outside offer had not occurred. If the firm's offer is above the outside offer, the worker might respond with a higher effort beyond the gift exchange response without the presence of the outside offer instead.

[20] See Farber (2008) for a theoretical model and Farber (2005) for a revised analysis of the data on this behaviour

choose when to quit or reduce their workload, expectations about future earnings can influence effort in a similar manner. Abeler et al. (2011) found in a real-effort experiment that workers work longer when expectations about future rewards and earnings are high. Another reference point affecting workers' behaviour can be the wage earned by a peer, such as another worker within the same company or industry. Using a gift exchange game grouping two workers and one employer, Gachter and Thoni (2010) showed that when workers are paid less than their peers they tend to work less than under equal wages. Similarly, Erkal et al. (2011) found that expectations about others' behaviour (e.g. level of generosity) can enhance or deter individuals to act more or less reciprocally. Abeler et al. (2010) instead found that equal wages might deter workers to work harder because of heterogeneous levels of productivity that an employer should be able to reward differently.

Similar to some of these studies using a three-player interaction in gift exchange games, in every round we group two employers and one worker. In the control condition the worker sees the wage offers of both employers randomly grouped with her and is randomly and bilaterally matched to one of the two employers, as in a standard game. In the treatment condition we introduce a sorting mechanism to allow workers to choose which of the two employers to work for and then select the level of work effort they want to provide[21]. By showing the workers two wage offers in every round we inevitably introduce a potential reference-wage. In our analysis we test whether this has an effect on workers' behaviour.

Similarly to the previous chapter of this thesis, we conjecture that when labour demand exceeds supply in a competitive environment, workers' choice of an employer over a competitor may in itself already capture reciprocation of higher

[21] Self-selection and sorting have often been overlooked by previous experiments, while disentangling this choice set might affect the magnitude of the observed level of reciprocity. Reflecting Akerlof's (1982) theory: "*A worker makes two choices. If offered employment (i.e., if the firm offers to "exchange gifts"), he must decide whether or not to accept the offer, and, if accepted, he must decide the size of the reciprocal gift*."

wage offers. If this is the case, then levels of effort may be diminished if the worker perceives (at least part of) reciprocity is provided through the employer selection. Further, economic models of involuntary unemployment suggest that fear of losing a job can operate as a worker discipline device when monitoring of worker's performance is imperfect (Shapiro and Stiglitz, 1984), so one should expect to see the opposite behaviour when the supply of labour exceeds the demand: workers should free ride more or provide zero (or close to zero) levels of effort because there is no penalty for them to do so, while employers will still have an incentive to offer higher wages to simply be chosen over a competitor. A natural consequence of this scenario would also be that employers' earnings will be lower in competition, and converge to close to zero profits in the long run, since in order to be chosen employers will keep increasing wage offers up to the total amount of their initial capital[22].

In contrast with what standard economic models would predict, we find that in competition wages increase faster and reach significantly higher levels than in non-competition, but they almost never reach levels of zero profits for the employer, with wage offers rarely exceeding 80% to 90% of an employer's initial capital. This suggests that even in competition employers set a 'maximum reservation wage', in the same way a worker would do with a lowest acceptable wage, in order to remain profitable. We find that workers keep reciprocating also in competition, but less than in non-competition, supporting findings from Chapter 1 of this thesis. We also find evidence that the reference wage of a competing employer affects a worker's effort: when workers cannot choose the employer to be partnered with but are instead randomly matched to the one offering a higher wage, they provide higher

[22] A labour market with an excess of labour demand should also not have involuntary unemployment in the long run. Employers can keep increasing wage offers up to the point where it becomes more profitable to train and upskill unemployed workers than keep offering higher wages to existing workers. Further, in a competitive labour market with low supply of labour, wages should be expected to increase fast, and if workers do not reciprocate with high levels of effort, one would expect business to fail sooner. However, none of these consequences are actually observed in labour markets.

levels of effort, ceteris paribus, with this effect being more or less strong depending on workers' characteristics.

In the last section of this paper we compare the results of the first and second chapter of this thesis and show that the presence of social incentives (i.e. Corporate Social Responsibility in the form of a donation of a percentage of profits to charity) reduces the level of optimal wage offers that maximise employers' earnings. Employers substitute wage offers for higher levels of social incentives, but this reduces workers' effort and, in turn, employers' earnings.

I. Hypothesis

In line with the analysis of the first Chapter of this thesis, we expect to observe employers reacting strategically to the presence of competition by providing higher wage offers:

HYPOTHESIS 1. H1: *The presence of competition among employers significantly increases wage offers compared to a non-competition environment*

Worker's reciprocal behaviour will then be observed in two ways: (i) the choice of the employer in the competition condition, and (ii) the chosen level of effort to provide to the paired employer. We study both behaviours accordingly:

HYPOTHESIS 2. H2: *Higher wages will lead to increased likelihood of an employer being selected in competition*

HYPOTHESIS 3. H3: *Workers are more likely to reciprocate and provide higher levels of effort as wages increase*

As in chapter 1, we expect the selection of the employer to be perceived as an act of reciprocity, hence reducing the level of work effort that workers will choose to provide:

HYPOTHESIS 4. H4: *The effects of wages on workers' effort will be weaker in competition since workers will have already partially reciprocated employers by choosing them over a competitor*

Our additional hypothesis in this chapter is about the effect of a possible reference-wage, namely the wage offer of the employer that is not randomly paired to the worker (when workers cannot select their preferred employer):

HYPOTHESIS 5. H5: *Workers will provide higher levels of effort when paired to the employer offering a higher wage than that of an unpaired competing employer*

In the next section we proceed with the explanation of our experimental design and results.

II. Experiment

A. Design and Procedures

Our experiment is a modified version of the original gift-exchange game by Fehr et al. (1993), similar to the version used in the first chapter. In the first stage of the game, all employers in the room decide independently how much of their initial endowment *E* of 120 Experimental Currency Units (ECU) they want to allocate to make a wage offer *w* to the worker and how much they want to keep for themselves.

In the second stage of the game, the worker sees the wage offer chosen by two employers randomly grouped with her and chooses a level of work effort to provide. In one condition, workers are randomly matched to one of the two employers, as in the traditional set-up of the gift-exchange game and other similar lab experiments with bilateral matching. Consistent with the terminology used in the first study, we call this condition 'non-competition' (NC). In the other treatment, workers can choose which of the two employers they want to work for. The employer that is not randomly matched to or chosen by the worker earns nothing in that round. We call this condition 'competition' (C).

At the beginning of each session a hard copy of the instructions is made available to each player and is read aloud by the experimenter, in an attempt to make all options and payoffs of employer, worker and charity common knowledge to all players[23]. Participants can also refer to the instructions and the payoffs formula throughout the session. A summary of the payoffs formula is shown in Table 1.

TABLE 1. Payoffs of players

Payoff Employer	$\pi_p = (E - w) \cdot e$
Payoff Worker	$\pi_a = w - c(e)$

After answering a series of comprehension questions to make sure all participants understood the instructions correctly[24], players are randomly allocated to be either employer or worker and stay in the allocated role for the duration of the experiment

[23] Instructions were identical to the ones used in the first experiment presented in Chapter 1, simply removing the presence of CSR and charity. See Appendix of Chapter 1 for a copy of the instructions.

[24] Participants answered on average 91% of questions correctly. A survey at the end of the experiment shows that 99% of participants found the instructions easy to understand and 98% thought the options available to them in the experiment were easy to understand.

– that is, 10 rounds. Exerting effort has a non-linear cost *c(e)* for workers, which is deducted from the wage offer of the randomly matched or chosen employer, according to Table 2.

TABLE 2. Cost of effort

Effort level *e*	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Cost of effort *c(e)* ECU	0	0	1	2	4	6	8	10	12	15	18

We implement a stranger design to avoid reputation effects: at the beginning of each of the ten periods, all players were reminded that they were going to be randomly regrouped with other two players. Participants in each session were also divided into matching groups. A matching group consisted of half of the employers and half of the workers in the room. For example, if a session had 18 players in total, participants were randomly split into two groups consisting of 6 employers and 3 workers each. Participants were not told which subjects belonged to which group and did not know what role was played by any other subject in the room. After the last round, subjects answered a short questionnaire.

The experiment lasted in total approximately 60 minutes. Points earned in ECU were then converted to Australian dollars at an exchange rate of 0.05AUD/ECU and participants were paid in cash for all rounds depending on the outcome of their choices and an additional AUD$5 show-up fee. The experiment was conducted at the Behavioural Computer Lab of the University of Sydney, Australia, in August 2016, for a total of six sessions with 108 participants. In both conditions, there were three sessions with n=18 participants. A summary of the demographic characteristics of participants across the two session types is provided in the Appendix. Participants were not statistically different between the two conditions

on any relevant demographic characteristic. The experiment was conducted using z-Tree (Fischbacher, 2007) and participants were recruited using ORSEE (Greiner, 2015). On average subjects earned AUD$ 18.

B. Results

In this section we present the results of the experiment and discuss possible explanations for the observed behaviour, both at the individual and group levels. We first analyze employers' behaviour between the competition (C) and non-competition (NC) treatments. Table 3 summarizes the key variables being discussed in this section. On average, wage offers of both employers and paired employer are higher in the competition condition than in non-competition.

TABLE 3. Descriptive Statistics of Wage Offer

ECU	***Competition***			***Non-competition***	
Variable	Obs.	Mean	Std. Dev.	Mean	Std. Dev.
Average wage offer (both employers)	180	84.83	16.22	57.06	17.73
Wage offer paired employer	180	91.06	15.72	56.43	25.54
Wage offer unpaired employer	180	78.59	19.45	57.69	23.28

The earnings by group level shown in Table 4 suggest that workers earned significantly more in the competitive setting, whilst employers earned more in the non-competitive setting.

TABLE 4. Descriptive Statistics by Groups[25]

ECU	***Competition***		***Non-Competition***	
Group	Average Employers Earnings	Average Workers Earnings	Average Employers Earnings	Average Workers Earnings
1	8.14	81.67	16.92	48.20
2	7.84	77.90	11.74	47.53
3	7.77	83.60	10.89	48.33
4	7.18	82.70	10.20	46.93
5	6.60	86.37	9.89	60.43
6	5.88	82.67	7.66	52.90
Average	**7.23**	**82.48**	**11.22**	**50.72**

Wage Settings – Figure 1 shows the average wage offer of both employers over ten rounds between the two conditions. On average, employers in both conditions offered wages that were above the minimum amount (i.e. 20 ECU). Wage offers started significantly higher in the competitive treatment, with average wage across the two employers in round 1 being 60.1 in the competition conditions, against an average of 50.6 in the non-competitive condition (p = 0.0473, Mann-Whitney test, with subject as unit of observation). The average wage offer increased in both conditions over the period of ten rounds, but substantially more in the competitive setting that in the non-competitive one. A t-test shows that the wage offers between

[25] Groups are listed in order of employers' earnings, from highest to lowest in competition and non-competition respectively

the two conditions are on average significantly different (t(358)=15.50; $p < 0.0001$, subjects as unit of observation).

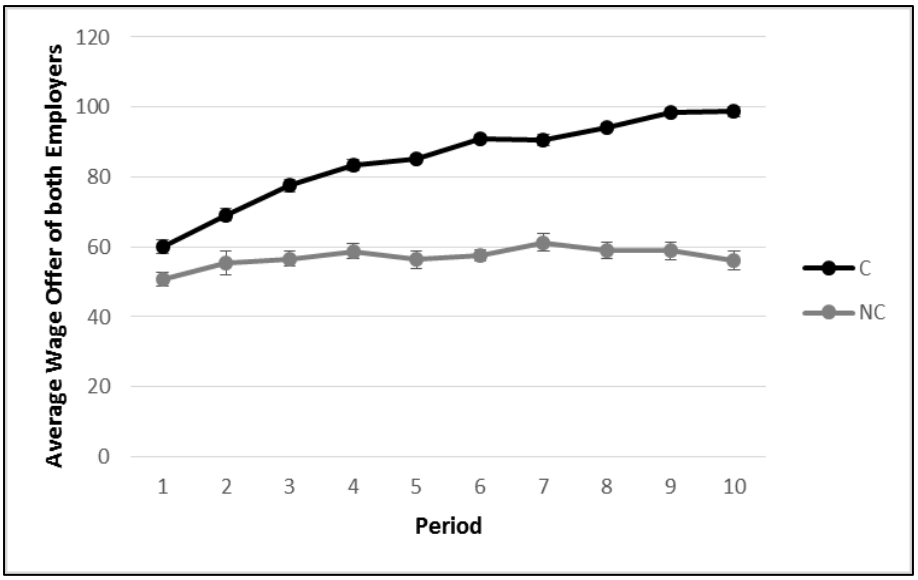

FIGURE 1. Average wage offer of both employers per period[26]

As in other standard gift exchange games where one employer and one worker are paired bilaterally, we look at the specific relationship between the worker and the paired employer. Similar to the results presented in the first chapter, we refer to paired employer as the employer chosen by the worker in the competition treatment and the randomly matched employer in the non-competition treatment.

Figure 2 plots the average wage offer of the paired employer only. We can see that the differences between the two conditions – competition and non-competition – are remarkable. In the competitive environment, employers start with an already

[26] Error bars refer to standard error around the mean for each period. In competition, standard errors are small and get smaller over time, which the graph cannot display properly without changing scales between conditions.

higher average wage, which increases steadily over time, whilst it starts lower and remains mostly constant over time in the non-competitive environment. Overall, the average wage of the paired employer is significantly higher in the competition treatment than in the non-competition condition (Mann-Whitney test: $p < 0.001$, group as unit of observation). The different wage offer of paired employer between conditions is on average around 23 ECU in the first round and more than 50 ECU in the last round.

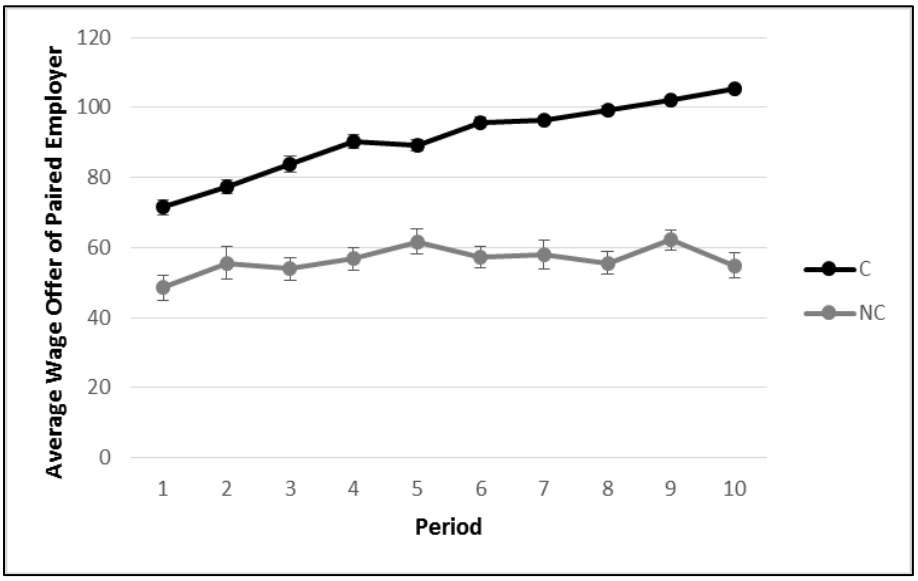

FIGURE 2. Average wage offer of paired employer per period

Wage Settings and Choice – We now examine whether workers' ability to choose their employers drives the increase in wage offers. Over all sessions in the competitive setting, employers chose the same wage 5% of the time. When employers chose different wages, workers chose the employer offering the higher wage 93% of time. Only one worker ever chose a lower wage, and this worker did this four times. Figure 3 shows the average wage offer of the chosen and not chosen

employer in the competitive setting. It can be seen that, like in the first study, the employer offering the higher wage is consistently chosen over the employer offering a lower wage.

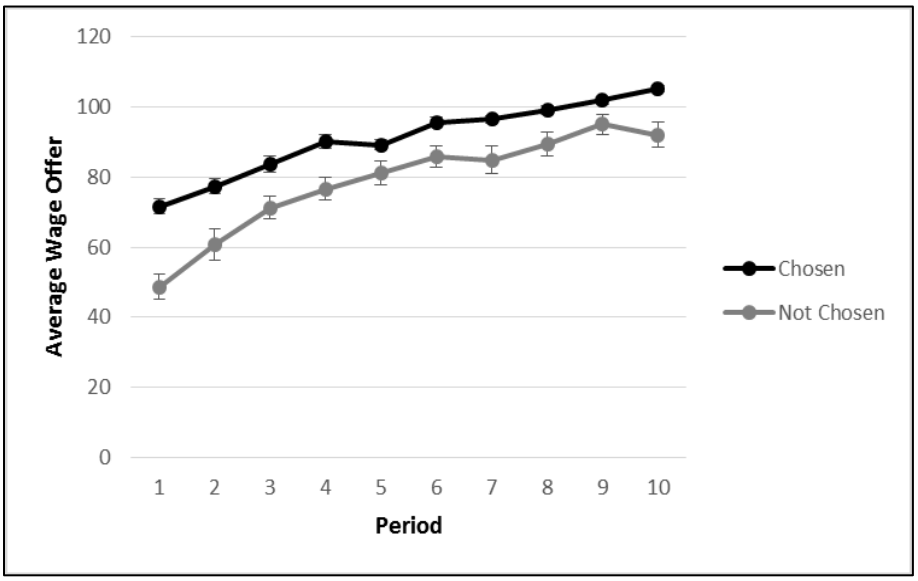

FIGURE 3. Average wage offer of chosen and not chosen employer in the competition treatment

Table 5 below reports estimates from a regressions measuring the probability of an employer *i* being chosen in the competition condition and whether she offered a wage that was higher than that of a competitor on that round (the independent variable), with the model specified as follows[27]:

(1) $$\Pr(Y_i = 1) = \beta_1 Higher\ Wage_i + u_i$$

[27] Including an independent dummy variable for when employers offered the same wage does not change the results

We cluster standard errors at the matching group level since subjects interacted throughout the experiment with the same subjects.

TABLE 5. Determinants of Employer Choice in Competition

	(1)	(2)
Constant	-1.971***	-10.90***
	(0.374)	(0.969)
Higher Wage Offer	3.976***	11.97***
	(0.856)	(0.344)
Pseudo - R^2	0.8398	0.9020
Cluster SEs	Yes	Yes
Round dummies	No	Yes
Observations	171	171

*** p<0.01; ** p<0.05; * p<0.1. Probit. Robust standard errors clustered around matching groups in parenthesis. We removed 9 observations where wage offers of the two employers were identical, hence not explaining why workers chose an employer over another.

Table 5 shows that the higher wage offer significantly increases the probability of an employer in being chosen in a competitive environment. As one would expect, the employer that offered the higher wage was virtually always the one being selected by the worker[28].

RESULT 1. *Employer selection was driven by higher wages (H2).*

[28] By simple construction, when employers offered the same wage, they both had a 50% chance of being selected.

Wage Determination – We are now interested in understanding how wages get determined and change over time across conditions. To achieve this goal we first regress the average wage offer of both employers and wage offer of the paired and unpaired employer against a dummy for competition, round dummies and interaction terms of round and competition dummies, clustering standard errors at the group level as in the previous analysis.

TABLE 6. Effect of Competition on Wage Determination

	Average Wage Offer of Paired and Unpaired Employer		Wage Offer Paired Employer	Wage Offer Unpaired Employer
	(1)	(2)	(3)	(4)
Constant	41.49**	50.64**	48.50*	52.78**
	(2.651)	(3.225)	(5.309)	(1.142)
Competition	27.77**	9.472	23.06	-4.111
	(1.217)	(2.312)	(3.825)	(0.799)
Round 2	6.903*	4.833	7.056	2.611
	(1.000)	(3.539)	(3.825)	(3.254)
Round 3	11.67*	5.944	5.444	6.444
	(1.578)	(2.740)	(1.827)	(3.654)
Round 4	15.74*	8.139**	8.278*	8**
	(1.395)	(0.542)	(0.742)	(0.343)
Round 5	15.40*	5.722	13.11	-1.667
	(1.789)	(2.969)	(8.335)	(2.398)
Round 6	18.76**	6.806**	8.889	4.722
	(0.690)	(0.200)	(6.965)	(6.565)
Round 7	20.62**	10.69*	9.556	11.83
	(0.549)	(1.399)	(9.248)	(6.451)
Round 8	21.26*	8.361	7.056	9.667*
	(1.733)	(4.139)	(9.077)	(0.799)
Round 9	23.31**	8.222	13.61	2.833
	(0.366)	(2.569)	(8.848)	(3.711)
Round 10	22.03**	5.500	6.333	4.667
	(1.521)	(1.199)	(3.768)	(1.370)
Round 2*Competition		4.139	-1.222	9.500
		(5.052)	(3.083)	(7.022)
Round 3*Competition		11.44	6.778	16.11*

		(2.283)	(3.083)	(1.484)
Round 4*Competition		15.19	10.39	20*
		(3.910)	(5.652)	(2.169)
Round 5*Competition		19.36*	4.500	34.22**
		(2.312)	(6.907)	(2.283)
Round 6*Competition		23.92**	15.28	32.56**
		(1.798)	(6.108)	(2.512)
Round 7*Competition		19.86*	15.33	24.39
		(1.684)	(10.28)	(6.907)
Round 8*Competition		25.81	20.50	31.11***
		(4.767)	(9.648)	(0.114)
Round 9*Competition		30.17*	16.78	43.56***
		(4.396)	(9.134)	(0.343)
Round 10*Competition		33.06**	27.39*	38.72*
		(0.685)	(2.683)	(4.053)
R^2	0.5065	0.561	0.481	0.378
Cluster SEs	Yes	Yes	Yes	Yes
Observations	360	360	360	360

OLS; Robust standard errors clustered around matching groups. We group all triads in one round to create one observation – that is, two employers and one worker randomly grouped together in one round, leading to $n = 360$. *** p<0.01; ** p<0.05; * p<0.1.

From Table 6 we can see that competition significantly increased average wage offer by a large effect from the first round, as explained by the dummy variable for competition.

RESULT 2. *The two conditions exhibit significant differences with respect to average wages: higher wages occurred in the competitive condition and they increased significantly over time, but not in the non-competitive condition (H1).*

It is possible that wages increase over time as employers see the wage offer of the unpaired employer and, in order to remain competitive, increase even more their offer in the next round. In competition, we would expect this effect to be stronger, since employers will offer higher wages to increase their likelihood of being chosen. We study this effect in a regression and report the results in Table 7 below.

TABLE 7. Wage Determination[29]

	Wage Offer Employer 1			
	(1)	(2)	(3)	(4)
Constant	50.70*	56.18*	51.64*	57.99*
	(4.218)	(5.942)	(5.807)	(6.969)
Competition	26.67***	10.86*	14.15	27.94*
	(0.393)	(1.046)	(3.520)	(2.801)
Wage offer Employer 2 on previous round	0.124	0.0347	0.0126	0.0395
	(0.0472)	(0.0623)	(0.0502)	(0.0544)
Wage offer Employer 2 on previous round * Competition		0.214**	0.180	0.0719
		(0.00635)	(0.0397)	(0.0861)
Round 2			-	-
Round 3			2.293	-0.526
			(2.233)	(3.149)
Round 4			6.115	-0.706
			(3.509)	(5.320)
Round 5			3.131	-4.677
			(3.601)	(3.807)
Round 6			6.281	-5.648**
			(1.571)	(0.203)
Round 7			6.471	-1.478
			(2.385)	(4.319)
Round 8			7.052	-3.242
			(3.612)	(7.282)
Round 9			12.08**	0.126
			(0.672)	(5.752)
Round 10			9.630	-2.820
			(3.178)	(1.891)
Round 2*Competition				-22.69
				(6.240)
Round 3*Competition				-16.17
				(4.568)
Round 4*Competition				-7.908
				(9.725)
Round 5*Competition				-5.969
				(7.295)
Round 6*Competition				2.526
				(3.303)
Round 7*Competition				-5.238
				(3.237)

[29] Round 1 variables were treated as missing observations

Round 8*Competition				-
Round 9*Competition				2.818
				(2.375)
Round 10*Competition				4.017
				(9.843)
Cluster SEs	Yes	Yes	Yes	Yes
Observations	324	324	324	324
R^2	0.3389	0.377	0.365	0.391

(1) to (4) OLS; Robust standard errors in parentheses (clustered on matching group).
*** p<0.01, ** p<0.05, * p<0.1 Omitted variables for rounds are due to perfect collinearity

We see from Table 7 that the lagged wage offer of the unpaired employer has a positive effect on the average wage offer in competition (model (2), $p = 0.019$), but not in non-competition. In our experiment, all players see a screen before the next round commences that reminds them that they will be paired to different players than the ones they just interacted with. As such, employers know they need to attract and motivate a new worker on every round, so it seems plausible that they adjust their wage offers based on what they expect other employers to offer.

Gift Exchange and Reciprocity – We now analyse the behaviour of the workers. Figure 4 shows the average effort over time across both conditions. In both competition and non-competition conditions work effort is mostly positive, 99% of times in the competition condition and 80% of times in the non-competition condition[30].

[30] In our setting workers can choose a value of zero and still receive the offered wage, while in other gift exchange games sometimes a level of zero work effort is considered as a rejection and both the employer and worker would earn nothing in that round

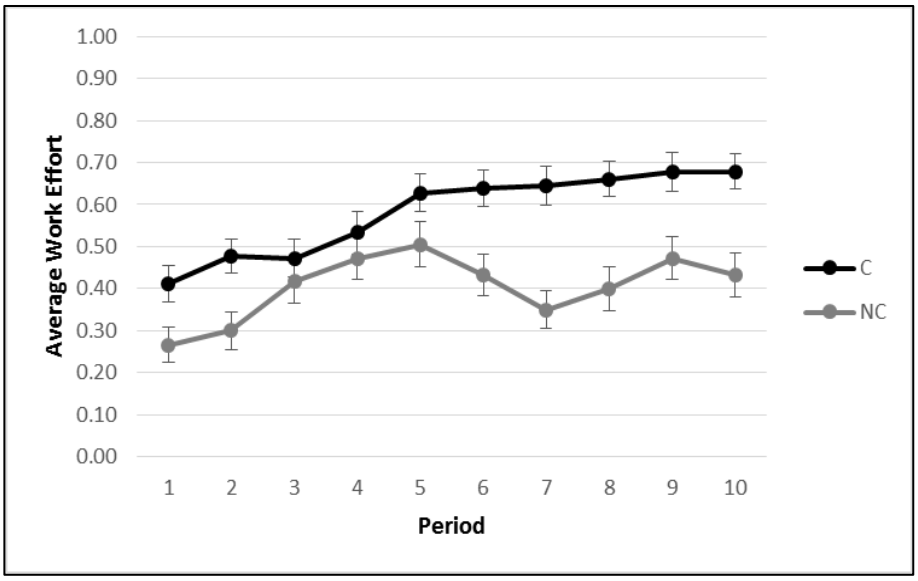

FIGURE 4. Average work effort per period between competition and non-competition conditions

To visualize the relationship between wage offer and work effort between the two conditions we plot the interactions with a line of fitted values (with a 95% confidence interval). Because we are interested in studying reciprocity in terms of how a level of work effort chosen by the worker affects outcomes for the employer, we do not consider the few observations when the paired employer offered a wage equal to 120 ECU, since no matter what the level of effort the worker would choose, this would lead to no earnings for the employer. This results in 3 and 2 observations being dropped in non-competition and competition respectively.

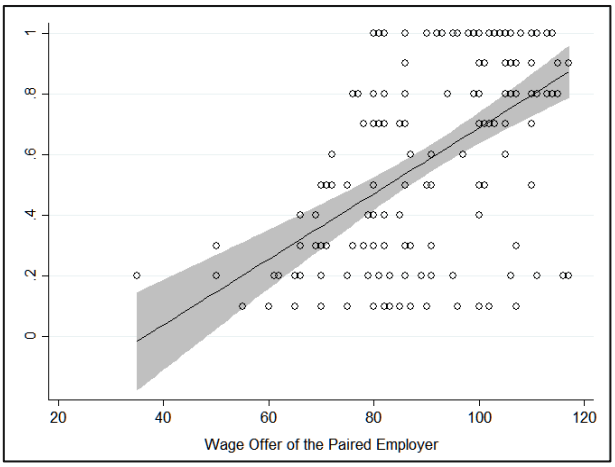

FIGURE 5. Work effort as a function of wage offer in competition condition

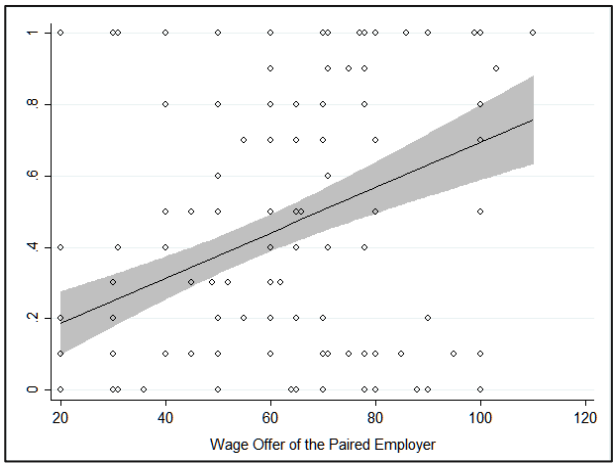

FIGURE 6. Work effort as a function of wage offer in non-competition condition

In line with previous studies and Chapter 1, we find evidence of gift-exchange in both competition and non-competition conditions. To investigate statistically the presence of gift exchange, we first look at the probability of providing positive effort as the wage offer of the paired employer increases. To achieve this goal, we create a dummy variable for gift exchange that gets a value of 1 when the level work effort chosen by the worker is higher than zero, and look at the number of times that there was a presence of gift exchange from the workers across both conditions.

We see that in the non-competition condition, workers provided a positive level of effort around 80% of times (142 out of 177 times if we exclude the 3 observations when the wage offer of the paired employer was equal to 120 ECU). One worker provided a level of effort of zero across all rounds, regardless of the wage offer she or he was paired to. In competition, instead, workers provided positive levels of effort 99.4% of times (a test of the relationship between wage offer and work effort in competition yields to the following result: Pearson's $\chi^2 = 39.05$; $p < 0.0001$, with

group as unit of observation)[31]. To measure the impact of wage offer of the paired employer, therefore, we use only the data from the non-competition condition and report the results in Table 8 below.

TABLE 8. Determinants of Gift Exchange (Non-competition condition only)

	Gift Exchange (binary 0 or 1)	
	(1)	(2)
Constant	-0.0185	0.100
	(0.312)	(0.263)
Wage Offer of	0.0169***	0.0185*
Paired Employer	(0.00652)	(0.0109)
Pseudo-R^2	0.0809	0.0963
Observations	177	167

(1) and (2) Probit. *** p<0.01; ** p<0.05; * p<0.1. Robust standard errors in parenthesis, clustered around matching group. In model (2) we removed the 10 observations of the worker that provided always a level of effort equal to 0.

From Table 8 we see that also in non-competition a high wage offer of the randomly paired employer significantly increases the probability of the worker to reciprocate providing positive levels of work effort, in line with previous studies.

Our second measure of gift-exchange is the slope of the effort in response to higher wages. Table 9 reports the results of a regression where effort is now a continuous variable, going from 0 to 1. Across both conditions in the experiment, workers provided zero level of effort 37 times (10%). Of these ones, only one was in competition. We use a Tobit model to censor observations where effort was equal to 0 or 1.

[31] Testing the probability of positive reciprocity in competition via a Probit regression would therefore drop all variables since they predict success perfectly.

TABLE 9. Determinants of Gift Exchange

	Work effort (continuous 0 to 1)	
Paired Employer	(1)	(2)
Constant	-0.104	0.406***
	(0.195)	(0.0536)
Competition Dummy	-0.401	-1.190***
	(0.260)	(0.0100)
Wage	0.00893***	0.00759***
	(0.00280)	(0.00108)
Wage * Competition	0.00372	0.00312***
	(0.00308)	(0.000576)
Worker dummies	No	Yes
Pseudo - R^2	0.1767	0.9416
Observations	355	355

Tobit, 35 left-censored and 65 right-censored obs.*** p<0.01; ** p<0.05; * p<0.1. Robust standard errors in parenthesis (clustered around matching group). Observations where wage offer of paired employer is equal to 120 ECU are removed (i.e. 5 obs.)

We can see from Table 9 that a higher wage offer increased the level of effort, but including a sorting mechanism has a negative effect on the level of effort provided by the worker.

RESULT 3 – *As wages increase, workers increase their effort, however competition decreases the level of work effort provided by the worker (H3 & H4).*

We now group wage offer of the paired employer by three groups: low (when wage offer is between 20 and 59 ECU); medium (60 to 99 ECU); and high (100 to 120 ECU). Plotting the average work effort across all workers we can see that, on

average, in both conditions a low wage is met with a very low work effort (Figure 12). In the competitive environment this relationship is almost linear.

FIGURE 7. Average work quantity as a function of low, medium and high wage offer of paired employer in both conditions

Reference Points – In the introduction of this paper we discussed the relevant literature on reference points and how different reference points (e.g. one's own future income or other workers' earnings) can influence behaviour. In our experiment we are interested to study whether knowing what the wage offer of another employer would affect worker's motivation. Specifically, we look closely at the data from our non-competition condition (NC), where the worker is first randomly grouped to two employers and then randomly matched to one of the two employers (i.e. cannot choose the employer). We compute the wage difference by subtracting the wage offer of the unpaired employer from the wage offer of the

paired employer. A negative value means the unpaired employer offered a higher wage than the paired employer[32].

We can observe substantial differences across conditions by plotting the distribution of the difference between wage offers of paired and unpaired employer on a histogram. In competition the average wage differences are more concentrated around small values, whilst in non-competition these differences are more spread across all values, including larger negative and positive differences.

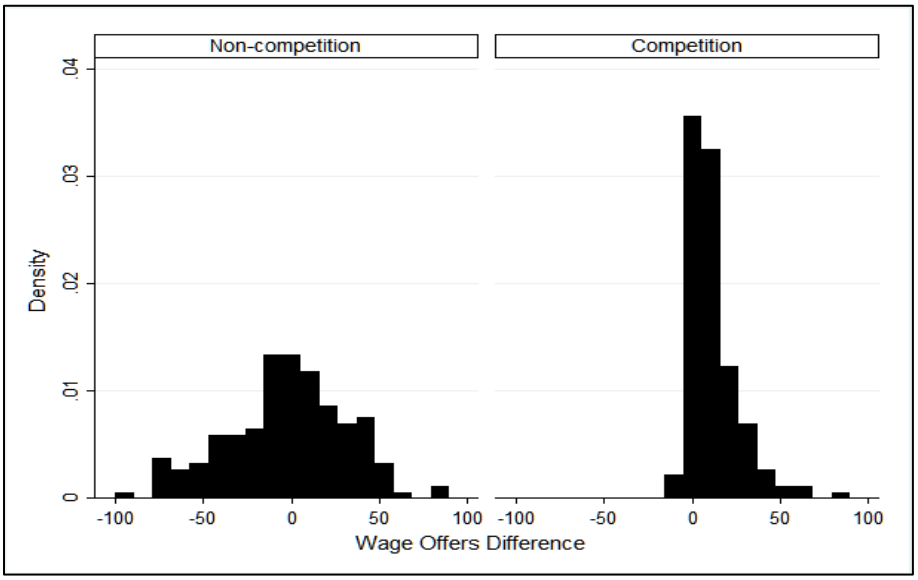

FIGURE 8: Difference between wage offer of paired and unpaired employer

[32] Recall that in our experiment, employers offered the same wage 9 times (5%) in competition and 14 times (about 8%) in non-competition.

To investigate whether the notion of a 'fair wage' is reference-dependent, we first look at the relationship between wage difference and workers' effort on a scatterplot with a linear prediction line and a 95% confidence interval. From Figure 9 we can see that there is a positive relationship between the wage difference and worker's effort: the larger the difference with a competitor, the higher the amount of effort the worker will reciprocate to the employer, with this effect being stronger in competition.

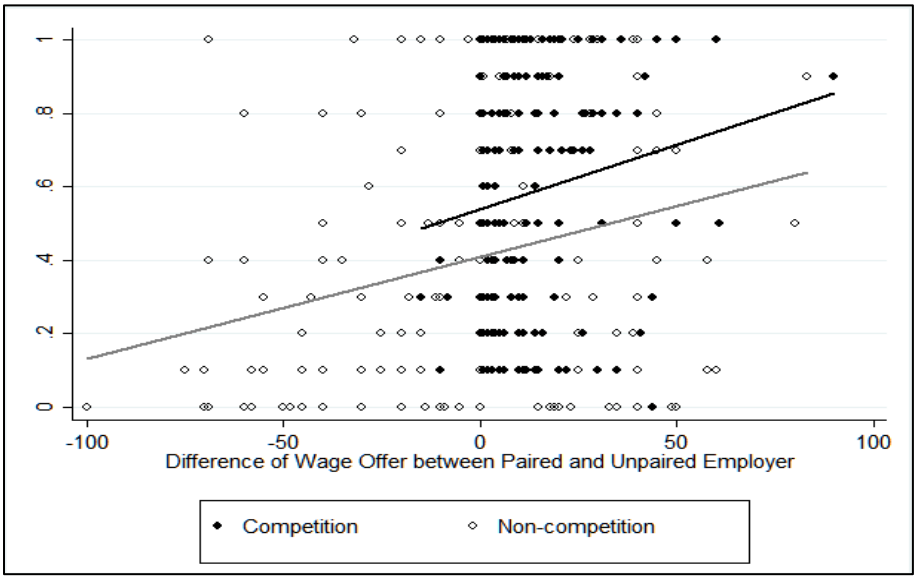

FIGURE 9. Work effort as a function of wage difference between paired and unpaired employer between conditions

However, it is possible that this behaviour is explained by the fact that the worker is being paired to a low wage offer in absolute terms, rather than in relative terms. To disentangle this effect, we examine the data from the non-competition condition only and create a dummy for when the worker is paired to the employer offering a

higher wage. We estimate this model using Tobit, censoring observations when work effort has values equal to 0 and 1.

TABLE 10. Competitor Reference Wage Effect on Effort

	Work effort (continuous 0 to 1)			
	(1)	(2)	(3)	(4)
Constant	-0.141	0.357***	-0.124	0.419***
	(0.174)	(0.0265)	(0.186)	(0.0412)
Wage Offer of Paired Employer	0.00953***	0.00887***	0.00889***	0.00690***
	(0.00243)	(0.000313)	(0.00241)	(0.000297)
Wage difference (Paired – Unpaired)	-0.000103	-0.000743		
	(0.000399)	(0.000465)		
Paired to higher offer dummy			0.0403	0.0798**
			(0.0271)	(0.0349)
Worker Dummy	No	Yes	No	Yes
Observations	177	177	177	177
Pseudo-R^2	0.1093	0.7448	0.1098	0.7494

(1) and (2) Tobit, 35 left-censored and 26 right-censored obs. Robust standard errors in parentheses, clustered around matching groups. Does not include 3 outliers where wage offer of paired employer was equal to 120 ECU.
*** p<0.01, ** p<0.05, * p<0.1 Worker Dummies are dummy variables for each worker to account for different levels of reciprocity among subjects assigned to the role of worker.

We can see from Table 10 that when the paired employer in the non-competition condition was offering a lower wage, this had a negative effect on effort, as expressed by the coefficient of wage difference (which takes negative values when the unpaired employer's wage offer is higher than that of the paired employer), although this was not significant.

The dummy variable indicating whether the worker was paired to the employer offering a higher wage, instead, has a positive coefficient. Column (3) of Table 10 seems to suggest that there is some directional effect of being paired to a higher wage offer in the non-competition condition. It is possible that this random outcome sparks different reactions across different workers, with some being indifferent

about being paired to a lower offer and others, instead, suffering a disutility and providing lower levels of effort as a result.

To take into account these worker-specific effects, we run again the Tobit models, this time including worker dummies, that is, dummy variables for each worker to account for different levels of reciprocity among subjects assigned to the role of worker. From column (4) we can see that being paired to a higher wage offer has a significant and positive effect on worker's effort ($p = 0.023$).

Further, we conjecture that if workers react to the wage offer of the unpaired employer in the non-competition setting, they may react more to subjective losses than subjective gains[33]. To analyse whether this is the case, we run a piecewise linear regression to allow for a kink where the wage difference is zero – that is, the two employers offered the same wage.

To do this, we use data for the non-competition setting only, and we create two dummy variables to estimate the predicted mean when the wage offer difference is just above and just below zero. We then create two variables for positive and negative wage differences to measure the slope of the effect.

[33] I thank a PhD thesis reviewer for this suggestion

TABLE 11. Competitor Reference Wage Effect on Effort Above and Below Zero

	(1)	(2)
Positive Wage Difference dummy	0.409***	0.698***
	(0.0706)	(0.0830)
Negative Wage Difference dummy	0.517***	0.857***
	(0.0546)	(0.0843)
Positive Wage Difference	0.00368**	0.00130
	(0.00185)	(0.00127)
Negative Wage Difference	-0.000496	-2.62e-05
	(0.00191)	(0.00131)
Worker dummy	No	Yes
Observations	177	177
R-squared	0.104	0.667

(1) and (2) OLS; Standard errors in parentheses

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

From Table 11 we can see in both models (1) and (2), with and without worker dummies respectively, when the wage difference is positive this has a positive effect on effort, whilst a negative difference has a negative effect, as shown by the two wage difference variables. The dummies also show that the intercepts differ between negative and positive wage differences. To see this more clearly, we plot the relationship between work effort and wage offer difference with a kink in zero, when the wage offers are identical.

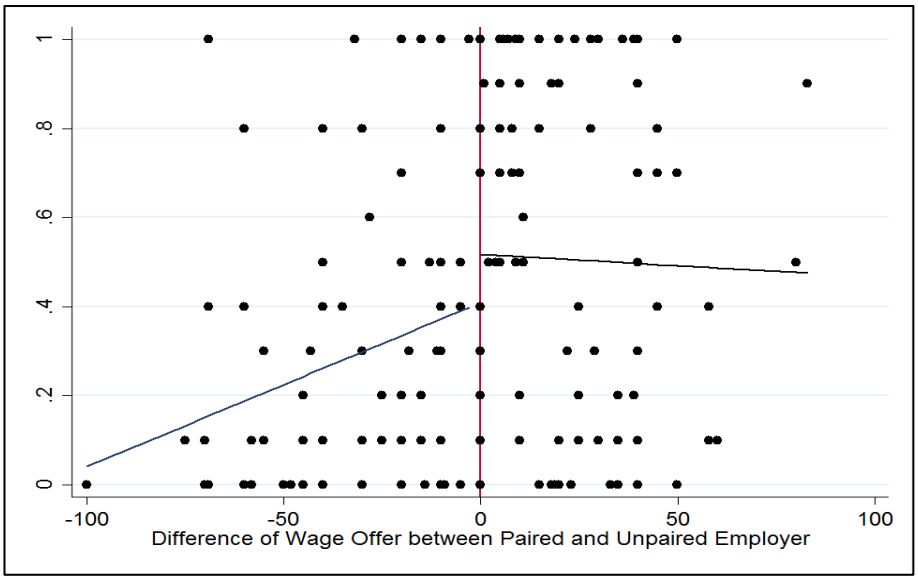

FIGURE 10. Work effort as a function of wage difference between paired and unpaired employer in non-competition

Figure 10 shows that the slope of effort is visibly steeper below zero than above zero. This confirms that subjects were more responsive to subjective losses than gains – that is, being paired to an employer who offered a lower wage was more 'painful' to the worker and led to a stronger (negative) reaction, than being paired to the higher offer employer, which led to a weaker (positive) reaction. In other words, workers penalised more employers that offered a lower wage than rewarding employers that offered a higher wage. This finding is in line with other previous studies on loss aversion (Kahneman, Knetsch, and Thaler, 1991).

RESULT 4 – *We observe a reference-wage effect, with workers providing higher levels of effort when they are randomly paired to an employer that offers a higher wage than that of a competitor in the same round (H4).*

RESULT 5 – *We observe a loss aversion effect, with workers reacting more negatively and providing lower levels of effort when they are paired to an employer offering a lower wage, than providing a higher level of effort when paired to an employer offering a higher wage.*

Employers' Earnings across Experiments – We now combine the data from the experiments of chapters 1 and 2 of this thesis and analyse employers' earnings. As expected, we see that the introduction of competition in both the presence or absence of social incentives (i.e. Corporate Social Responsibility in the form of donations of a percentage of profits to charity) negatively affects employers' earnings as they have to give up higher levels of capital to offer more attractive wages. We see that across all conditions employers' earnings reach a maximum amount after which they start decreasing, as captured by the negative sign of the squared term in Table 12.

The presence of social incentives reduces the maximum wage offer that maximizes earnings for the employers in competition, but has a negative impact on profits.

TABLE 12. Earnings of Employers across conditions

	(1)	(2)	(3)	(4)
	Competition with Social Incentives	Non-Competition with Social Incentives	Competition	Non-Competition
Constant	-11.88***	-6.440*	-27.53***	4.033
	(4.579)	(3.328)	(6.964)	(5.784)
Wage Offer	0.421***	0.513***	0.621***	0.363**
	(0.133)	(0.0936)	(0.173)	(0.176)
(Wage Offer)^2	-0.00253**	-0.00371***	-0.00289***	-0.00326**
	(0.00103)	(0.000738)	(0.00109)	(0.00145)
Round Dummies	Yes	Yes	Yes	Yes
Observations	360	360	360	360
R^2	0.057	0.096	0.096	0.024
Optimal Wage Offer	83.34	69.05	107.45	55.614
	(10.510)	(3.729)	(12.678)	(6.603)
Average Employer Earnings	6.88	7.89	7.23	11.21
	(10.77)	(11.44)	(4.65)	(11.03)
Average Worker Earnings	68.83	47.15	82.48	50.722
	(16.37)	(20.37)	(13.94)	(24.11)
Average Charity Earnings	2.65	5.66		
	(4.72)	(10.06)		

Standard errors in parentheses for the regressions and standard deviation for average values across conditions on last rows. *** p<0.01, ** p<0.05, * p<0.1

This trend is represented visually also by the figure below, which maps earnings of paired employers as a function of wage offer. We see that the substitution effect is strong, as expected, but more so in competition, where wage offers concentrate in the higher average amounts (bottom right corner of the graphs). The presence of social incentives (CSR) limits this substitution effect, in both competition and non-competition, reducing the optimal wage offer but also average earnings.

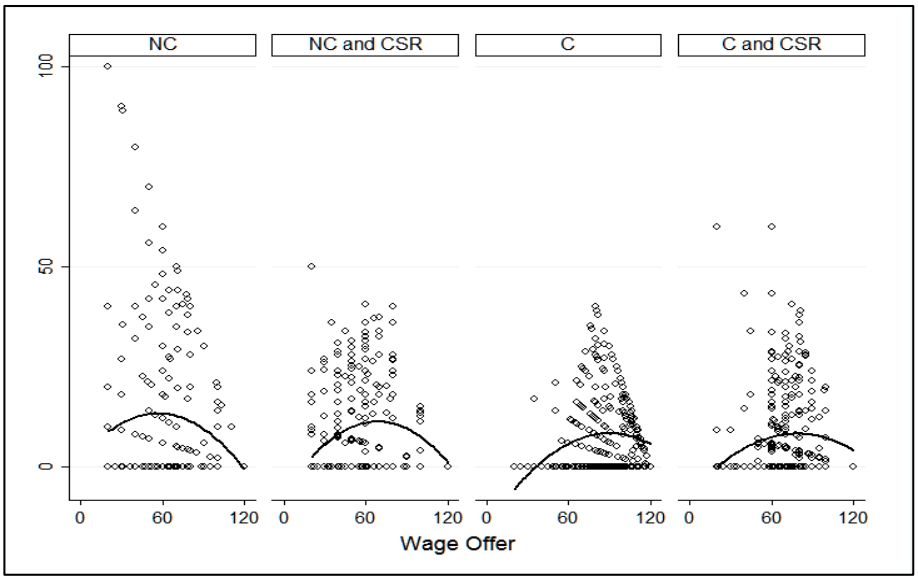

FIGURE 11. Employers' earnings as a function of wage offer, with and without CSR, in competition (C) and non-competition (NC).

FIGURE 12. Employers' earnings Conditional Distribution Functions across all conditions

III. Discussions and Conclusions

Empirical evidence shows that workers' performance can differ significantly not only across industries and geographical areas but also within the same industry or employer. Numerous studies explained these variations by studying worker-specific characteristics (e.g. education, race and gender). Less attention has been paid to the role played by employer-specific characteristics. In this study we showed how the presence of competition among employers increase wages but reduces effort provided by the worker, supporting results from chapter 1 that the selection of the employer over a potential competition is already perceived by the worker as a reciprocal act. This study also contributes to the literature on reference-dependent behaviour. Other studies showed that worker's effort can be affected by the presence of reference points such as one's own expected level of income or earnings of other similar workers. In this experiment we show that the wage offer that another employer would offer can also affect worker's reciprocal behaviour. We find that when workers are randomly paired to an employer offering a higher wage they reciprocate with higher levels of effort, ceteris paribus. Furthermore, we find that workers show an aversion to losses, penalising more employers who offered a wage lower than a competitor than rewarding employers who offered a wage higher than a competitor.

A comparative analysis of earnings across conditions of all experimental sessions from chapters 1 and 2 show how employers' earnings are negatively affected by the presence of social incentives due to a reduction in wage offers that decreases workers' motivation. This is in contrast with previous studies that examined financial or social incentives separately, rather than within the same environment. Future laboratory experiments using gift-exchange game or real-effort tasks should consider introducing sorting mechanisms to account for self-selection and improve external validity.

Appendices

A. Demographic Characteristics

	Competition			***Non-competition***			
Characteristic	Mean	%	SD	Mean	%	SD	*p*-value
Female	27	50%	0.50	27	50%	0.50	0.50
Age	23	42%	3.13	23	43%	4.68	0.50
Undergraduate	35	65%	0.48	37	69%	0.47	0.48
Major Econ or Business	15	28%	0.45	24	44%	0.50	0.41
At least one donation in past year	40	74%	0.44	42	78%	0.42	0.48
Low Generosity	11	20%	0.41	13	24%	0.43	0.48
Medium Generosity	18	33%	0.48	22	41%	0.50	0.46
High Generosity	10	19%	0.39	7	13%	0.34	0.52
High Disposable Income	5	9%	0.29	12	22%	0.42	0.43

p-values are calculated with a Wilcoxon-Mann-Whitney test, with subjects as unit of observation.

B. Descriptive Statistics by Groups

ECU	***Competition***		***Non-Competition***	
Group	Average Employers Earnings	Average Workers Earnings	Average Employers Earnings	Average Workers Earnings
1	7.18	82.70	9.89	60.43
2	8.14	81.67	10.20	46.93
3	6.60	86.37	7.66	52.90
4	5.88	82.67	11.74	47.53
5	7.77	83.60	10.89	48.33
6	7.84	77.90	16.92	48.20
Average	**7.23**	**82.48**	**11.22**	**50.72**

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CHAPTER 3

Generous by Default: A Field Experiment on the Impact of Defaults on Charitable Giving

Defaults proved to influence behaviour across a range of areas, from retirement savings to organ donations. When not well designed, defaults present the challenge of reducing an individual's freedom and sense of control. In this paper we study the role of defaults in a previously unexplored setting where a preference for control might be stronger than in other contexts: charitable giving. We analyse results of a field experiment ran by an NGO hosting an online peer-to-peer microlending platform. In the experiment, lenders who had their loans fully repaid, but did not take any action for more than a year, received an email inviting them to use their money by a certain date in any way they preferred – withdraw, lend, donate or leave idle. In two treatment groups, lenders were told that if they did not take any action by the given date, their money was automatically going to be donated to the organisation (default donation) or re-lent to a group of borrowers on their behalf (default loan). We find that defaults are effective at increasing both the proportion of individuals giving to charity and the amount of giving, compared to a simple ask. The default loan treatment was more effective than the default donation, suggesting that to influence behaviour without risk of backfiring, defaults should be designed to consider individuals' past behaviour and self-selection.

Donations to charity can be a rewarding act for a donor. Individuals might donate a portion of their money or time to a charitable organisation for a number of reasons, such as to improve the wellbeing of others, to increase their own feeling of self-fulfilment, or to send a signal to their peers about their altruistic nature. At the same time, choosing a deserving recipient can be a costly exercise: a well-informed donor would have to collect and review information on a number of charities before choosing a preferred way to give and the size of the donation[34]. One possible way to reduce these costs is to delegate the choice of the recipient to a better-informed agent who will make the donation on the donor's behalf. However, this mechanism can also reduce the giver's sense of control and satisfaction acquired from the act of giving.

To explore this trade-off between donor's engagement and delegated choice, we analyse results from a field experiment ran by an NGO that hosts a peer-to-peer online microlending platform. The available literature on peer-to-peer microlending suggests that users of these platforms show behavioural patterns and social preferences that are virtually identical to those of individuals who donate to charities via more traditional fundraising channels.[35] As such, motivations and incentives to lend for pro-social purposes are similar to other charitable giving contexts. The NGO's experiment allows us to test the impact of two different types of defaults. A sample of 360 lenders who had money left in their NGO account for more than a year from previous fully repaid loans was selected and randomly allocated to: (i) control, (ii) default donation, or (iii) default loan. Subjects in the

[34] There are an increasing number of online platforms that help potential donors identify a suitable recipient, such as CharityNavigator.org, GiveWell.org and CharityWatch.org, to name a few.

[35] A study by Galak et al (2011) using data from Kiva.org on a sample of almost 300,000 loans found that lenders favour individual borrowers over groups of borrowers and prefer borrowers who are socially proximate to themselves on gender, occupation and first name initial. This suggests that the type of donors who are attracted by platforms such as Kiva.org might be motivated by 'warm glow' feelings. Another study by Chen et al. (2014) found that lenders on Kiva.org who join a team – that is, a group of lenders who team up to raise more and larger loans - contribute 1.2 more loans per month than those who do not join a team. This too confirms the impact of social incentives, such as social norms, in increasing charitable contributions, like in other traditional settings.

control group were asked to make one of three possible choices with their idle money: make a loan, donate it to the NGO or cash it out ('simple ask' control group). If they did nothing, their money would remain idle. In the two default treatments subjects were notified that if they did not take any action by a certain date, all their idle money would automatically be either donated to the organisation ('default donation' treatment group), or re-lent to another group of borrowers ('default loan' treatment group).

Results show that both default treatments increased the total number of givers and the amount given compared to the control condition. We observe that the default loan treatment had a significantly larger effect on increasing giving, suggesting that defaults that align with donors' preferences and past behaviour have a greater effect and, perhaps, a lower risk of backfiring. This is the first paper to provide experimental evidence on the role of defaults to increase charitable giving.

I. Relevant Literature and Hypotheses

In the following section we review the literature on charitable giving and defaults, which has previously been unexplored in the same setting. We present a number of hypotheses that are related to previous studies focusing on what motivates people to give to charity and what behavioural biases can help explain the effectiveness of defaults. We discuss how insights from these two areas of research can overturn expectations on how defaults can influence charitable behaviour.

In the hypotheses and the remainder of the paper we will use the general term 'charitable giving' to define both donations and microloans to borrowers in developing countries, as the latter cannot be considered a financial product given the close to zero return on investment. In the following analysis of the experiment, the "amount of money" refers to the money from previous fully repaid loans that

have been left idle for at least one year by a selected number of lenders on the peer-to-peer microlending platform. We also provide a brief overview of the possible reasons why some individuals might prefer loans to more standard donations. We also discuss why this choice can be considered a form of self-selection into one's preferred mode of giving, influencing the effectiveness of defaults as a consequence.

A. Why Do People Give to Charity?

The growing field of behavioural economics research provides evidence that in a wide range of scenarios, people systematically deviate from the rational self-interested utility-maximising agent described by standard economic theory. Kahneman, Knetsch and Thaler (1991) provided a first summary of laboratory experiments showing that individuals do not always behave consistently with simple models of utility maximization (e.g. demonstrating preference reversals and violating transitivity). The view of standard economic theory is that in the charitable giving space, the *homo economicus* acts on a purely self-interested basis. Following this logic, individual contributions to charities should not be observed if donors do not receive any benefits from it. Despite this line of thought, individuals can benefit from donating in a number of ways, as it signals their wealth to others or delivers a feeling of 'warm glow' (Andreoni, 1989). The basic assumption behind the economic model of 'warm glow giving' proposed by Andreoni (1989; 1990) can be summarized as follows: if individuals behaved purely altruistically by contributing to a public good, the efficient level of provision of their contribution is achieved when the marginal rate of substitution between the public and private good equals the marginal cost (Bergstrom et al. 1986; Andreoni, 2006). This means that if another donor or the government provides the public good in its entirety, an

individual should not make any additional charitable contribution as it would decrease both the level of efficiency of the public good and her own utility by giving up consumption. Thus, individuals should be unconcerned about the difference between a charitable contribution made voluntarily (e.g. a monetary donation) or involuntarily (e.g. by being taxed by their government).

However, the literature finds that large donations from either a donor or government grants do not fully crowd-out individual contributions to charity (Andreoni and Payne, 2003). This difference can be attributed to the fact that individuals might perceive their donations as another consumption good that maximizes their utility, or in other words, increases their feeling of 'warm glow'. The basic foundations of the 'warm glow giving' model by Andreoni (1990) paved the way for a number of laboratory and field experiments studying donors' behaviour and motives for giving. In the following section we see how the existing literature on motives for giving and the role of defaults can be linked, even though their interaction has not yet been extensively studied.

B. The Effectiveness of Defaults on Giving

The psychology and behavioural economics literature have identified a large number of biases affecting individual decision-making. The '*status quo bias*,' perhaps one of the strongest biases, is the powerful tendency to remain in one's current position rather than changing to an alternative option, even when an alternative option might be more beneficial. Due to this, it is important to understand how defaults are set and how individuals come to sort themselves into default options. Madrian and Shea (2001) and Thaler and Benartzi (2004) showed that if retirement saving choices are framed as opting out instead of opting in, both the participation and the savings rate increase. Similarly, Johnson and Goldstein

(2003) show that countries with opt-out organ donor defaults (i.e. presumed consent to be an organ donor unless they choose to opt out) have a significantly higher number of potential organ donors than countries with opt-in donor defaults. There are several different explanations for why defaults are effective. Below we discuss a selection of possible explanations for what makes defaults relevant to the charitable giving context.

One explanation for the effectiveness of defaults is that opting out can require time and effort in the immediate term, which might deter some individuals from taking action, even if opting out has substantial benefits in the long run. This tendency to over-value immediate benefits and costs (e.g. time, money or even just cognitive stress) at the expense of long-term improvements is known as '*present bias*' (see Altmann et al. 2015; Tu and Soman, 2014; Sunstein, 2013; and Thaler and Sunstein, 2003, among others). A potential donor may be deterred by immediate costs that are on top of the value of the donation itself. Slonim et al. (2016), for instance, show that a longer waiting time to donate blood has a significant negative impact on the probability of a donor to return. Similarly, in a field experiment, Chuan and Samak (2014) found that asking households to write a personalised card, as opposed to a pre-written card, to accompany their donation decreased the proportion of people giving. These results, while they might seem intuitive, are somewhat in contrast to the charitable giving literature, which instead suggests that some donors give to charity for personal satisfaction and 'joy of giving' (Ribar and Wilhelm, 2002). The waiting time to donate blood and the ability to personalise a message to accompany a donation, as shown in the studies cited above, could be perceived as part of one's donation, hence increasing donor satisfaction. On the one hand, potential donors may be attracted to defaults as they can reduce (or remove entirely) any immediate additional costs from giving;

however, defaults can also displace the concomitant feeling of 'warm glow' associated with charitable giving.

Other authors have argued that defaults might influence behaviour because they signal that a third party (who can make decisions on one's behalf) is better informed about best outcomes (McKenzie et al., 2006; Tannenbaum, 2011). Sunstein (2012) defines this as an implicit endorsement: "*if choice architects have explicitly chosen that rule, people may believe that they should not depart from it unless they have private information that would justify a change*". In charitable giving this signalling effect can be particularly strong, especially when a donor has already supported a charity in the past. When full information on the outcome of one's donation is not clear or easily available, a certain degree of trust in the intermediary (i.e. the NGO) is required to attract donors[36]. In a lab experiment, Butera and Houser (2016) show that delegating the choice of a donation recipient to an algorithm that guarantees efficiency of giving does not reduce donations. Similarly, the right level of contribution can be 'suggested' via defaults as a signal of what is considered a sufficient amount, as in an anchoring effect fashion[37]. In a field study Goswami and Urminsky (2016) show that setting a suggested donation amount as a default in a charitable appeal increases both participation rates and the average amount donated. However, because it is reasonable to assume that a charity might want to reallocate the funds raised from donations to different programmes or projects depending on the needs of its beneficiaries, the implicit endorsement can backfire in charitable giving. When this happens, previously set defaults might become an obstacle as they set unrealistic expectations from donors on how their money will be spent.

[36] See Coffman, 2017 for a study on the role of campaigns as intermediary to attract donations.

[37] See Furnham and Boo, 2011 for a review on the anchoring effect.

Our first hypothesis reflects the possibly positive effects that defaults can have on influencing charitable behaviour, suggesting that defaults help reduce or remove immediate costs (i.e. overcoming present bias) and leverage on the implicit endorsement of the NGO setting the default:

HYPOTHESIS 1a. H1a: *Default loans and default donations in our experiment both increase the proportion of individuals giving to charity compared to a simple ask*

HYPOTHESIS 1b. H1b: *Default loans and default donations in our experiment increase the amount of charitable giving compared to a simple ask*

Our second hypothesis, instead, is a rejection of the first hypothesis and considers the opposite scenario. Considering the evidence offered by the literature on motives for giving, one can expect defaults to reduce giving if donors feel that the donation is entirely delegated and not increasing their satisfaction in giving or control over the allocation of the contribution:

HYPOTHESIS 2. H2: *Default loans and default donations crowd-out giving due to loss of control or disutility from forgone sacrifice*

Defaults can also influence behaviour by affecting how alternative options to the default (or simply opting-out) are evaluated, inducing a '*reference-dependent bias*' (Kahneman and Tversky, 1979). This bias refers to the tendency of decision-makers to evaluate outcomes as gains or losses relative to a reference point. Outcomes of a decision that are superior to the reference point are perceived as gains, and inferior outcomes as losses. It is reasonable to expect that the way individuals sort themselves (directly or indirectly) into a default option, will lead

them to perceive that default as a reference point and value alternatives as gains or losses (Dinner et al. 2011). The reference-dependent bias inevitably influences decisions via loss aversion – that is, the propensity of individuals to receive greater disutility from a loss than positive utility from a gain of the equivalent magnitude. Some studies also suggested that reference-dependent bias and loss aversion may affect the construction of preferences via retrieval of information from memory: individuals may use a pre-existing preference or a past decision retrieved from memory as a reference point, and evaluate alternatives accordingly (Dinner et al. 2011; Carmon and Ariely, 2000; Nayakankuppam and Mishra, 2005).

When giving to charity, reference points can influence behaviour if a person has an existing preference for giving via a specific channel, supporting a certain cause, or likes to always contribute the same amount of money or time. This can be seen in the often-adopted measure taken by charities of asking donors to commit to regular gifting via automatic bank transfers (e.g. equal monthly installments). If a regular donor uses previous gifts as a reference point, a charity changing the type of projects it supports could have a negative effect on the donor. In the experiment analysed in this paper, for instance, subjects who supported the NGO in the past via loans might perceive an alternative mode of giving, such as a donation, as less preferable.

The opposite argument, however, could also hold. A donor could experience diminishing marginal utility from always giving in the same way, meaning that an NGO offering an alternative mode of giving might seem more attractive. The influence of reference points, such as past behaviour, upon the effectiveness of defaults remains unclear and is worth exploring. To better understand this effect, we examine two different types of defaults in this experiment. In one treatment, the default results in money being lent to a group of borrowers, hence reflecting past behaviour of the decision-maker and taking into account a possible sorting mechanism that attracted the subject to the lending platform in the first place. In

the other treatment, the default results in money being donated to the organisation, as in a more standard charitable giving fashion, which is inconsistent with the past revealed preference of the subject of making a loan.

One would expect that individuals who choose to join a peer-to-peer micro-lending platform might have be attracted by features of these environments that are different to more traditional charities. One of these may be the possibility to monitor the impact of one's contribution via loan repayments, increasing one's sense of control over the outcome of a monetary contribution. It has been shown that individuals who have an external locus of control might have a weaker perception of their ability to bring change through their own behaviour and actions (Rotter, 1975). For instance, people with external locus of control will feel that their environmentally friendly actions might not make much of a difference because other agents (e.g. factories) make a bigger footprint on climate (Kollmuss and Agyeman, 2002). Similarly, these lending platforms might be attractive because they give the sense that one's contribution goes 'straight' to the beneficiary, overcoming donors' aversion to cover the NGO's administrative or fundraising costs (Gneezy et al. 2014).

Another reason why some individuals might be attracted to microlending platforms is the direct one-to-one connection with the beneficiary, reducing social distance and making the act of giving more personal and 'human'. Charness and Gneezy (2008) showed that when players know the family name of their counterparts in a dictator game, those playing dictators allocate a significantly larger portion of their endowment to the other players. This could be referred to as the '*identifiable beneficiary effect*', similar to the identifiable victim effect, extensively studied in psychology (Jenni and Lowenstein, 1997). Chen and

Putterman (2015) find for instance that lenders on Kiva.org[38] are more likely to lend to borrowers with whom they share gender and ethnic similarity, suggesting that 'homophily' and preferences of specific characteristics of borrowers are important. Yet another reason why a donor might prefer a microloan to a donation is because a microloan can give the feeling of 'warm glow' from giving multiple times over the duration of the loan repayment, as opposed to a one-off contribution.

Future research can help explain why some individuals might prefer loans to donations. However in this paper we are interested in understanding how such choices can be interpreted as a strong signal of self-selection into this specific preferred method of giving, whatever the motivation that led individuals to join a microlending platform in the first place. Not accounting for this signal might lead defaults to backfire. In other fundraising settings a signal of past behaviour can come from the amount of a previous donation or the choice of the type of charity to support. In other contexts, someone's past behaviour can be revealed by previous active choices or via various methods of elicitation, such as choosing a realistic target for retirement savings. Our next hypothesis can then be generalised as follows:

HYPOTHESIS 3. H3: *Defaults are more effective when aligned to decision-maker past behaviour (a loan in this case) and when the loss of control is lower*

More recently, a number of studies suggested the importance of carefully designing defaults to align default-setter and decision-maker interests (Altman et al. 2015), and to reflect individual preferences (Sunstein, 2013). This paper

[38] Kiva.org, a platform that connects lenders to small entrepreneurs in developing countries and more recently also in the United States, has been the first successful organization of this kind. Partnering with microfinance institutions on the ground, Kiva.org allows lenders to make loans to any preferred borrower from a minimum of USD$25. Since its creation, Kiva.org has exponentially increased in size and amount of funding being transferred to developing countries, leading other NGOs to follow a similar approach.

contributes to this growing body of literature, showing how past behaviour and self-selection can reveal individual preferences and how defaults can be designed to better reflect this information. The setting of the experiment examined in this paper also provides a particularly attractive environment to understand the role of self-selection and past behaviour to influence the effectiveness of defaults. If subjects in this experiment joined the NGO lending platform because of a preference for loans, they will be more averse to defaults not reflecting such preference (e.g. a default donation). In the next section we describe the experimental design more in detail and discuss the results.

II. Experimental Design

In this paper, we analyse data from an NGO that runs a peer-to-peer micro-lending platform[39]. As in other similar platforms, lenders can choose to allocate any preferred amount of money to make loans to borrowers in developing countries, donate money to the organisation hosting the platform, or both. When a loan is fully repaid, a lender can choose to cash out the money, make another loan, and donate it to the organization or any combination of these options. If they don't take any action, their money will remain idle on their online account for an undetermined period of time. The partner NGO wished to find innovative ways to address the issue of a growing amount of funds that were left idle in lenders' accounts, in many cases for more than a year, after loans had been fully re-paid. A sample of 360 lenders was selected and stratified by amount of money left idle in the account, gender and number of days since last activity. All lenders received an email from the NGO inviting them to take any preferred action by a given date (see Appendix

[39] The NGO prefers to remain anonymous. For further information, contact the main author of this paper.

for a copy of the email template)[40]. In order to make it easier to take any action, the email contained a link to the login webpage and explained how to retrieve username and password in case the lender forgot it[41]. The emails were personalised by adding the first name of the lender at the beginning of the email and were signed off by the Chief Operating Officer, who had been the same person in that role for a number of years, hence the name would have been familiar to all recipients from previous communications, such as newsletters.

Lenders were then randomly allocated to one of the three groups: one control and two default treatments where only one sentence in the email differed. In the 'default donation' group, lenders were told that if they did not take any action by the end of the month, all the money left idle in their account was going to be donated to the organisation. In the 'default loan' group, lenders were told that if they did not take any action by the end of the month, all the money left idle in their account was going to be lent to a group of borrowers chosen by the organisation on their behalf. As in other similar settings, default options gave lenders the opportunity to opt-out and take any action they preferred before the defaults 'kicked in'.

The treatment sentence varied across groups as follows:

i. **Control**: *You may want to do this by the end of the month, so you don't forget.*

ii. **Default donation**: *We understand you're busy, so if you don't do anything by the end of this month, we will automatically donate any credit*

[40] In a field experiment, Damgaard and Gravert (2016) sent out emails soliciting donations for a large Danish charity, where one group of people received an email reminder in addition to the original message. This increased both the likelihood of giving and the total amount raised. Because all lenders across groups in our trial receive the same email, we partially control for the reminder effect alone.

[41] Rasul and Huck (2010) show that small hassle factors can have important implications for charitable giving, so we wanted to ensure small friction costs, such as finding the login page, were removed.

*you have left in your account to [*name of NGO*]. Your donation will be used to teach women the money management skills they need to help themselves and their families escape a life of poverty.*

iii. **Default loan**: *We understand you're busy, so if you don't do anything by the end of this month, we will automatically lend any credit you have left in your account to a group of borrowers supported by [*name of NGO*]. Your loan will help women and their families escape a life of poverty.*

All emails were sent out at the same time on Tuesday 20 September 2016 at 10:30am using an email monitor software. Another reminder email was sent out to on Wednesday 28 of September 2016 at 10:30am. The end of the month then referred to the last day of September 2016, giving 10 days to lenders to take any preferred action.

III. Results

A number of emails 'bounced back' by the system indicating the email address probably no longer existed or the lender wished to not receive any more communication from the organisation. The bounce rate was as follows:

TABLE 1. Final sample

	Number Bounced	Percent Bounced	Final Sample
Control	10	8.3%	110
Default Donation	15	12.5%	105
Default Loan	17	14.2%	103
Total	42	11.7%	318

The email accounts that bounced back were removed from the final sample for the analysis, leading to a total of 318 lenders. Table 2 provides a summary of the key variables by group.

TABLE 2. Summary Statistics per Group

	% Female	Idle funds		Days Since Last Activity	
		Min; Max	Mean	Min; Max	Mean
Control	72%	25 ; 401	111.5	544 ; 1069	847.54
			(81.91)		(132.70)
Default Donation	72%	25 ; 414	111.34	544 ; 1096	834.49
			(87.97)		(144.03)
Default Loan	73%	25 ; 434	110.18	544 ; 1049	841.16
			(87.06)		(123.04)

Standard deviation in parentheses

None of the characteristics summarized in Table 2 were statistically significantly different across groups (see Appendix for balance checks).

A. The Impact of Defaults on the Extrinsic Margin

Table 3 and Figure 1 below report the number of lenders that resulted in one of the possible outcomes, whether this was the result of an active action or the default option being activated. There are four possible outcomes: Idle (money remains idle), Donation (money is donated to the NGO), Loan (money is loaned to a new borrower, and Withdrawal (money is cashed out and returned to the lender). In

Table 3 and Figure 1 we let the outcome equal 1 if any positive amount occurs for an outcome. Thus, since it is possible that more than one outcome can occur if the lender allocates a portion of their existing idle money to more than one of the four possible outcomes, the sum of outcomes on the extrinsic margin can be greater than 1.

TABLE 3. Percentage of subjects that resulted in positive outcomes (i.e. contributions were > $0)

	Idle	Donation	Loan	Loan or Donation	Withdrawal
Control	**90%**	5%	20%	24%	0%
Default Donation	13%	**78%**	24%	100%	0%
Default Loan	7%	3%	**96%**	99%	1%

Note: some people took more than one action, resulting in more than one outcome

Only one lender decided to withdraw all of her money (AUD$ 421.00). Excluding this person from the graph, Figure 1 provides a visual summary of the impact of the three outcomes showing that both defaults were largely effective at achieving their intended outcomes.

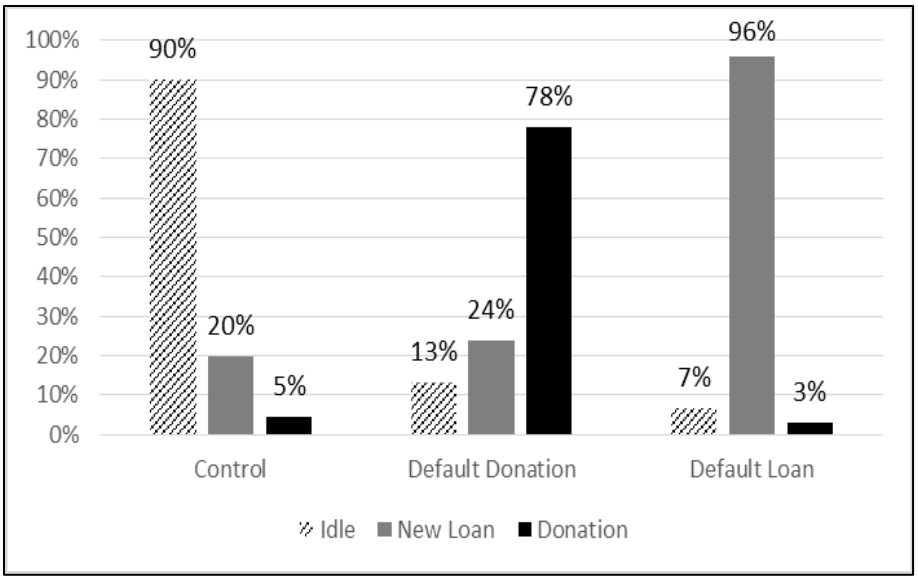


FIGURE 1. Percentage of subjects that resulted in one of the possible outcomes; Note: Some lenders took more than one action[42].

To measure the impact of defaults on the probability of giving we estimate the following response probability model:

$$\Pr(Y_i = 1) = \alpha + \beta_1 Default_i + \beta_2 Female_i + \beta_3 Days\ Since\ Last\ Activity_i + \beta_4\ Idle\ Amount_i + u_i \quad (1)$$

In (1), the dependent variable is a binary variable that takes the value of 1 if the outcome resulted in a loan or a donation of any positive amount and 0 if the money was left idle or withdrew. The term *Default* is also a binary variable taking the value of 1 if the individual was randomly assigned to one of the two default treatment (Donation or Loan), and equals zero otherwise. We then add the three control variables: Female (a binary taking the value of 1 if the individual is female) and the

[42] The amount left idle in the two treatment groups is money left over from loans. If a lender had more money than what is required to make a preferred number of loan she or he would leave that money idle in the account.

continuous variables Days Since Last Activity equal to the number of days since last activity and Amount Idle for the amount left idle in the account when they were initially contacted for the NGO's experiment. Table 4 reports the results of these regressions.

TABLE 4. Marginal Probability to Give

	(1)	(2)
Baseline (Control) Giving	*24%*	*24%*
Default	0.759***	0.773***
	(0.041)	(0.042)
Female		0.065
		(0.053)
Days since last activity		-0.000284*
		(0.000149)
Amount Idle		-0.000226
		(0.000181)
Observations	318	318
Pseudo R-squared	0.6399	0.7114
t-test Control = Default	t(317) = -5.77	t(317) = -25.05
	p<0.0001	p<0.0001

(1), (2) Marginal Probit (*dprobit*) Model. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The coefficient of the default variable is large and statistically significant, suggesting that being in a default group marginally increased the probability of giving by more than 75 percentage points. Given that 24% of subjects gave a donation or loan in the control (non-default) condition, the 75 percentage point increase is the maximum possible, indicating the default options lead to at least some positive amount of giving by all subjects in these conditions. Table 3 also shows that, as expected, a negative and significant coefficient of days of inactivity indicating that the longer a lender has been inactive the less likely she or he is to give again (driven entirely by subjects in the control condition given every subject in the default condition gave). A Pearson's χ^2 test on each default treatment taken

separately reveal that both treatments individually have a statistically significant effect in increasing the probability of giving[43].

RESULT 1. *Defaults significantly increase the proportion of individuals giving according to the outcome set by the default (H1a)*

Observing more closely the differences between the two default treatments, we see that in the default loan group 19 lenders (18%) opted out of the default. Of these, one withdrew the money and three chose to actively donate it to the organization (for an average amount of AUD$96), with the remaining 15 actively making a new loan. In the default donation group, 27 lenders opted out (26%), of which only two chose to donate directly to the organisation (not waiting for the default to kick in, for an average of AUD$99) and the other 25 making new loans. We see a larger proportion of lenders opting out of the default donation than default loan, but this difference is not statistically significant (t(206):1.2615; $p = 0.104$, subjects as unit of observation). The number of lenders in both default treatments that chose to actively donate to the organisation is almost identical (three in the default loan group and two in the default donation group).

B. The Impact of Defaults on the Intrinsic Margin of the Total Amount Given

We now analyze the monetary impact of the default treatments. We begin by examining the amount given overall, and then look at the intrinsic margin of the amount given among those who gave something (i.e., an amount greater than $0).

Overall, we find that the total amount given across the two default treatments combined led to a total revenue of AUD$22,453 compared to AUD$2,993 in the

[43] $\chi^2 = 57.18$ and $\chi^2 = 51.61$ for default donation and default loan respectively.

control group, and the average amount given per subject across the two default treatments was AUD$108 compared to just AUD$27 in the control group.

To measure the impact of the default treatments, we estimate the following model:

(1) $$Y_i = \alpha + \beta_1 Default_i + \beta_2 Female_i + \beta_3 Days\ Since\ Last\ Activity_i + \beta_4\ Idle\ Amount_i + u_i$$

The independent variables remain unchanged from the previous model (1), but the dependent variable Y_i is now the total amount of money given by each subject via both loans and donations. We then add a series of interaction terms to observe the differences in slopes with the continuous variables as follows:

(3) $$Y_i = \alpha + \beta_1 Default\ Donation_i + \beta_2 Default\ Loan_i + \beta_3 Female_i + \beta_4 Days\ Since\ Last\ Activity_i + \beta_5\ Idle\ Amount_i + \beta_6(Default\ Donation_i * Idle\ Amount_i) + \beta_7(Default\ Loan_i * Idle\ Amount_i) + \beta_8(Default\ Donation_i * Days\ Since\ Last\ Activity_i) + \beta_9(Default\ Loan_i * Days\ Since\ Last\ Activity_i) + u_i$$

Table 5. Total Amount Given[44]

	(1)	(2)	(3)
Constant	-88.96***	-30.40	67.24*
	(26.35)	(24.13)	(39.81)
Default donation	132.3***	43.64***	-83.88*
	(9.804)	(13.91)	(50.36)
Default loan	129.2***	58.24***	-88.91
	(9.847)	(13.98)	(54.68)
Female	13.45	12.48*	12.09*
	(8.318)	(7.253)	(7.213)
Days since last activity	-0.0337	-0.0270	-0.142***
	(0.0273)	(0.0238)	(0.0452)
Idle Amount	0.763***	0.313***	0.301***
	(0.0426)	(0.0725)	(0.0726)
Default donation * Idle Amount		0.676***	0.694***
		(0.0935)	(0.0935)
Default loan * Idle Amount		0.518***	0.544***
		(0.0944)	(0.0947)
Default donation * Days since last activity			0.151***
			(0.0578)
Default loan * Days since last activity			0.172***
			(0.0624)
Observations	318	318	318
Pseudo R-squared	0.1134	0.1288	0.1319
Log-likelihood	-1338.703	-1315.4433	-1310.7775
Default donation = Default Loan	F(1,313)=0.14	F(1,311)=1.48	F(1,309)=0.01
	p = 07114	p = 0.224	p = 0.9197
Default donation * Idle Amount = Default loan * Idle Amount		F(1,311)=3.47	F(1,309)=3.12
		p = 0.063	p = 0.0782
Default donation * Days since last activity = Default loan * Days since last activity			F(1,309)=0.15
			p = 0.6965

Tobit, 84 left-censored obs. Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Parameter estimates in Table 5 show that the two default treatments have a large and significant effect in increasing the total amount given, via both loans and donations. The effect of the two defaults is also represented by all the variables where

[44] The same regression using OLS is provided in Appendix D.

the treatment dummies enter as interaction terms – namely, β_6 to β_9 – and are all positive and significant. From the coefficients of the interaction treatment dummies with number of days of inactivity and the results of the F-tests reported at the bottom of Table 5, we can see that inactivity had a similar effect between the treatment groups (both increasing the amount given by approximately 15% to 17%). The difference of coefficients between the interaction treatment dummies with amount left idle, instead, is larger and weakly significant. This suggests that the impact of defaults might be different between groups.

To examine the distinct impacts of treatments on possible outcomes, we focus on the average amounts raised across groups. Figure 2 below shows that the treatments were effective in achieving their intended objectives, with higher average amount of money being lent in the default loan group compared to the other groups, and higher average amount being donated in the default donation group than in the other two groups. As a result of the trial, the amount of money left idle in lenders' accounts was significantly lower in the default donation (M=$2.57, SD=10.45) than in the control group (M=$86.71, SD=85.19), $t(213)=10.04$, $p<0.0001$ and significantly lower in the default loan group (M=$1.15, SD=6.10) than in control, $t(211)=10.16$, $p<0.0001$.

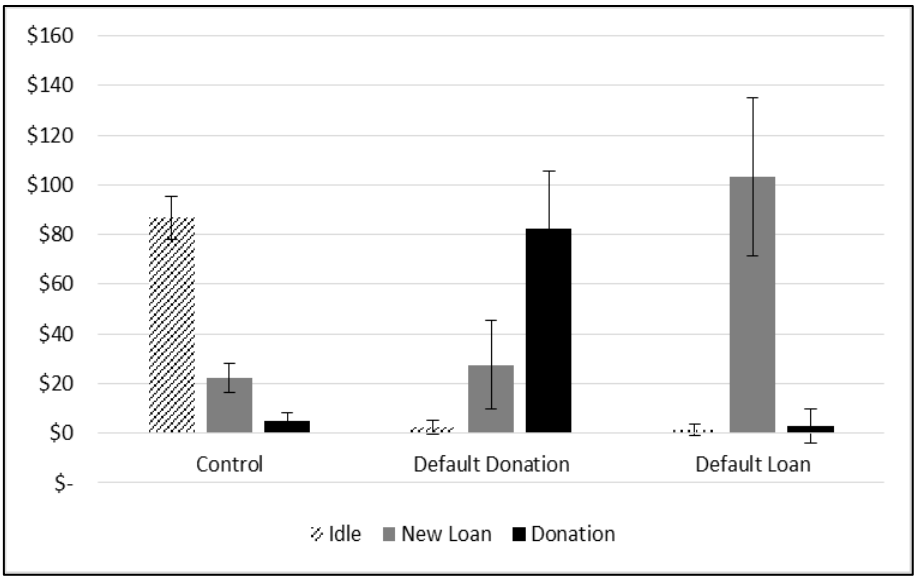


FIGURE 2. Average amount of money that resulted in one of the outcomes (one standard deviation error bars)

RESULT 2. *Defaults are more effective than a simple ask at increasing average amount contributed to charity (H1b).*

Observing these results, we can reject the crowding out hypothesis:

RESULT 3. *Defaults do not crowd out charitable giving (H2).*

To study the differences across groups we estimate the same model as in equations (2) and (3) but with dependent variable being either amount lent only or amount donated only. We also analyse the outcome differences between behaviour of all subjects and for only subjects who gave a positive amount (i.e, the intrinsic margin).

TABLE 6. Donated and Lent Amount – Overall and Intrinsic Margin Effects

	Donated Amount		Lent Amount	
	(1)	(2)	(3)	(4)
	Overall (All Subjects)	Intrinsic Margin (Subjects who gave > 0)	Overall (All Subjects)	Intrinsic Margin (Subjects who gave > 0)
Constant	-173.3***	-30.36	-126.7***	-17.61
	(58.51)	(28.03)	(48.47)	(23.07)
Default donation	227.5***	54.13***	15.59	-0.272
	(24.42)	(15.70)	(17.71)	(11.03)
Default loan	-31.06	51.60*	171.7***	11.88
	(30.43)	(26.37)	(17.21)	(9.000)
Female	-11.62	-5.282	30.34**	-2.672
	(18.24)	(8.693)	(15.20)	(7.431)
Days since last activity	-0.0360	-0.00868	-0.0393	0.0217
	(0.0590)	(0.0259)	(0.0499)	(0.0241)
Idle Amount	0.485***	0.871***	0.609***	0.899***
	(0.0882)	(0.0434)	(0.0747)	(0.0373)
Observations	318	91	318	146
R-squared		0.832		0.810
Pseudo R-squared	0.1490		0.0856	
Log-likelihood	-597.37166		-955.07239	
Default donation = Default loan	F(1,313)=0.14 $p < 0.0001$	F(1,85)=0.01 $p = 0.9064$	F(1,313)=86.64 $p < 0.0001$	F(1,140)=2.08 $p = 0.1513$

(1) and (3) Tobit, 227 and 172 left-censored obs. respectively; (2) and (4) OLS. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Columns (1) and (3) from Table 6 report the result for all lenders (n=318) and columns (2) and (4) report the result for only those lenders who gave[45], via loans (n=146) or donations (n=91), a positive amount. We can see that being in the default donation group significantly increased the amount being donated, both overall and at the intrinsic margin, with default donation treatment being significantly more effective than default loan at increasing donations overall. Similarly, the default

[45] It is noted that since the treatment has already been shown to affect behaviour on the extrinsic margin, using the subset of the data with positive amounts can introduce an endogeneity problem.

loan treatment significantly increased the amount lent by all subjects, but not at the intrinsic margin.

We now examine the role played by past behaviour in influencing the effectiveness of defaults, as stated in our hypothesis (H3). To achieve this goal, we stack our dataset to observe giving via loans and donations for each individual in our sample. We create a number of interaction terms and estimate the following model:

$$\begin{aligned}(4)\qquad \Pr(Y_i = 1) = {} & \beta_1 Default\ Donation_i * (1 - loan\ dummy) + \\ & \beta_2 Default\ Loan_i * loan\ dummy + \beta_3 Default\ Donation_i * \\ & loan\ dummy + \beta_4 Female_i + \beta_5 Days\ Since\ Last\ Activity_i + \\ & \beta_6\ (Idle\ Amount - Average\ Idle\ Amount)_{\ i} + u_i\end{aligned}$$

In model (4) the dependent variable is a dummy variable with a value of 1 when the subject gave any positive amount of money via loans and donations for each individual (i.e., two observations per subject). The independent binary term '*loan dummy*' takes the value of 1 when the money is given via loans and 0 when given via donations. Conversely, the dummy '*1-loan dummy*' takes a value of 1 when the money is given via donations. The first independent variables cover 3 of the 4 possible outcomes from the introduction of defaults. The first term shows whether subjects who were randomly assigned to the default donation group gave any amount of money via donations - i.e. the default matched the expected outcome of the way the subject gave to charity ('donation match'). The second term shows whether subjects who were randomly assigned to the default loan group, hence matching their past behaviour, actually gave any positive amount via loans ('loan match). The third independent variable instead cover the cases where there was a possible mismatch between the default and the subjects' preferences, namely

whether subjects placed into a default donation ended up giving any positive amount of money via loans ('donation mismatch'). From a first look at the data we can see that in the opposite scenario of the latter variable, only 3 subjects that were randomly placed into the default loan group gave any positive amount via donations, for an average of AUD$96.

In order to better understand the influence of amount of money left idle on default outcomes, in a second and third model we introduce the variable *Idle Amount* centred on its mean (i.e., Idle_c_i = Idle$_i$ – mean Idle). We estimate the model using Probit and marginal Probit, clustering error terms on the subjects' unique ID.

TABLE 7. Preferences for Way of Giving – Probability of Giving

	(1)	(2)	(3)
Constant	-1.894***		
	(0.250)		
Donation Match:	2.669***	0.731***	0.732***
Default donation * (1 – loan dummy)	(0.285)	(0.0381)	(0.0383)
Loan Match:	3.658***	0.819***	0.819***
Default loan * loan dummy	(0.460)	(0.0355)	(0.0355)
Donation Mismatch:	1.181***	0.431***	0.427***
Default donation * loan dummy	(0.284)	(0.0866)	(0.0874)
Idle_c Amount		-0.000197	
		(0.000226)	-
Female			0.00666
			(0.0138)
Days since last activity			0.000112
			(8.59e-05)
Default donation * (1 – loan dummy) *			-0.000625
Centred Ide Amount			(0.000602)
Default loan * loan dummy * Centred			0.000771
Idle Amount			(0.000591)
Observations	416	416	416
Pseudo-R^2	0.5030	0.5035	0.5081
Test difference in giving when default conditions matched (i.e., Default Donation * (1 –loan dummy) = Default Loan * loan dummy)	$\chi^2 = 13.93$ $p = 0.0002$	$\chi^2 = 14.25$ $p = 0.0002$	$\chi^2 = 13.70$ $p = 0.0002$
Test difference in giving when default	$\chi^2 = 30.82$	$\chi^2 = 30.80$	$\chi^2 = 31.07$

conditions mismatched (i.e., Default Donation * (1 - loan dummy) = Default donation * loan dummy)	$p < 0.0001$	$p < 0.0001$	$p < 0.0001$

(1) Probit; (2) and (3) Marginal Probit. Robust standard errors, clustered around lender unique ID, in parentheses. Idle_c Amount omitted from model (3). *** p<0.01, ** p<0.05, * p<0.1

We can see from the parameters in columns (1) to (3) and the related results of the tests at the bottom of each column that when the outcome matched the intended objective of the default, the probability that a subject gave a positive amount was significantly higher compared to when there was a mismatch, as shown by the negative coefficient of the constant term and the F-test results. Further, comparing the marginal effects (via marginal probit) of matched donation versus matched loan from columns (2) and (3), we see that the probability of subjects to give a positive amount to charity was significantly higher via loans, with this result being robust to the introduction of control variables. This suggests that the default that was most effective at increasing the probability of subjects to give was the one that better reflected individuals' past behaviour, namely lending the money to a group of borrowers instead of donating it to the organisation.

We now undertake a similar analysis, this time focusing on the effect of matched and mismatched defaults on the amount of money given to charity, via loans and donations[46].

TABLE 8. Preferences for Way of Giving – Amount Given

	(1)	(2)	(3)
Constant	2.796	-1.673	-1.404
	(1.777)	(6.846)	(4.413)
Donation Match:	79.55***	79.06***	79.19***
Default donation * (1 – loan dummy)	(8.748)	(7.833)	(6.459)
Loan Match:	100.3***	100.3***	100.8***
Default loan * loan dummy	(8.827)	(8.859)	(5.339)

[46] In Appendix E we report the results of the same model but considering only observations where the amount given is positive (i.e. dropping observations where the amount given was zero) and show that the results are qualitatively the same.

Donation Mismatch:	24.82***	24.34***	24.69***
Default donation * loan dummy	(6.742)	(7.502)	(6.216)
Idle_c Amount		0.455***	0.00316
		(0.0397)	(0.00980)
Female		-2.282	-2.190
		(2.437)	(2.316)
Days since last activity		0.00760	0.00689
		(0.00644)	(0.00583)
Default donation * (1 – loan dummy) * Centred Ide Amount			0.680*** (0.140)
Default loan * loan dummy * Centred Idle Amount			0.828*** (0.154)
Default donation * loan dummy * Centred Ide Amount			0.297** (0.141)
Observations	416	416	416
R^2	0.251	0.494	0.616
Test difference in giving when default conditions matched (i.e., Default Donation * (1 – loan dummy) = Default Loan * loan dummy)	F(1, 207)=3.02 p = 0.0835	F(1, 207)=6.26 p = 0.0131	F(1,207)=8.09 p = 0.0049
Test difference in giving when default conditions mismatched (i.e., Default Donation * (1 – loan dummy = Default donation * loan dummy	F(1, 207)=18.92 p < 0.0001	F(1, 206)=18.79 p < 0.0001	F(1,206)=20.33 p < 0.0001

(1) to (4) OLS models. Robust standard errors, clustered around lender unique ID, in parentheses. Idle_c Amount omitted from model (3). *** p<0.01, ** p<0.05, * p<0.1

From the results presented in Table 8 we can see that on average, the two variables "donation match and "loan match" raised larger amounts of money given to charity. When we look at the interaction terms in column (3) we can see that the variable "Default loan * loan dummy * Centred Idle Amount" has a larger coefficient, which means that the amount of money originally left idle is also a strong signal of what was the preference of subjects in the experiment, namely they liked more loans than donations. Hence, when a subject was placed in a default treatment that did not reflect her past behaviour, this led to a significant decrease in

the amount of money raised by the charity via defaults. Figure 3 below visually summarizes the outcomes of the defaults depending on whether they matched or mismatched with past behaviour, compared to the 'simple ask control group'.

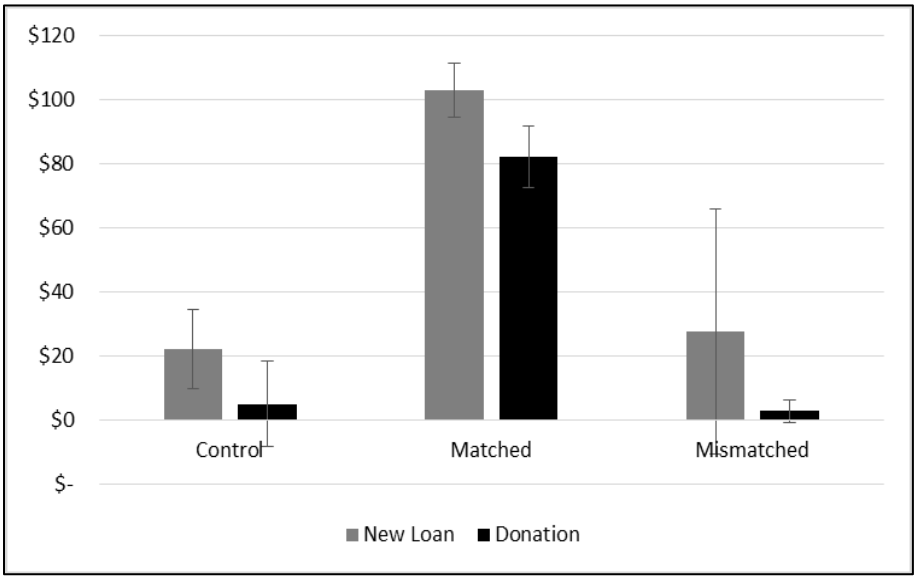


FIGURE 3. Average amount given via loans and donation depending on whether the subject was randomly assigned to a default that matched past behaviour

RESULT 4. *We find evidence that past behaviour has a significant role in determining the success of defaults (H3).*

In this analysis we showed that being placed in a default with outcomes that reflected past behaviour increased both the probability of that default to be successful and the magnitude of this effect. In our case, placing a subject into a default loan increased the probability of that person to give and the average amount of money given. We also found that the amount of money originally lent can be interpreted as a signal of the subjects' preferences for loans over donations.

V. Conclusions

In this paper we provided experimental evidence of the impact of defaults in a previously unexplored setting: charitable giving. Consistent with the positive impact of defaults in other settings, such as retirement saving and organ donations, defaults can be effective at increasing both the proportion of givers and the amount given. We provide evidence then that even in an environment where individuals might prefer to retain a stronger control over outcomes, such as in charitable giving, defaults do not crowd-out the intended behaviour. However, we find compelling evidence that in order to maximize their effect, defaults must take into account individuals' preferences, which can often be elicited by observing past behaviour and understanding why an individual chose or defaulted into a certain situation in the first place. In the case studied in this paper, subjects might have originally joined the peer-to-peer microlending platform because they were attracted by the opportunity to lend to borrowers in developing countries as opposed to the more traditional way of donating money to charity. Not considering self-selection and past behaviour can lead to lower than expected effects (or possibly even negative effects) from defaults.

An important challenge faced by charities trying to innovate their fundraising strategies is how to retain donors over time. Some charities increasingly ask their donors to commit to giving more regularly, e.g. on a monthly basis, by agreeing to transfer money directly from their bank account. It is important that this type of strategies keep reflecting donors' preferences and the way their money is used over time is consistent with the reason that attracted them to giving to that particular charity in the first place. If charities want to be able to change how they allocate resources across projects over time, they should be wary that using default

contributions as a fundraising strategy can create difficulties in informing regular donors that their money will be used in a different way than their originally agreed on. Not understanding this trade-off between relying on regular donors and having operational flexibility can lead to negative consequences, such as a higher level of drop-out of donors or a decreased amount of donations.

Similarly, government agencies or organisations interested in implementing defaults in other policy settings should consider the important role played by self-selection and understand how and why individuals got into a specific situation in the first place. Testing and evaluating different types of defaults can help improve effectiveness of defaults and avoid negative consequences.

Appendices

A. Trial Email Template – Control Group

Hi Guglielmo, you have money left in your [NGO Name] account

[NGO Name] <NGO email address> Date & Time
To: "guglielmo.briscese@sydney.edu.au"

Hi Guglielmo ,

Our records indicate you have a credit balance in your [NGO name] account.

You can use this money to make another loan, donate to [NGO name], or you can cash it out. You may want to do this by the end of the month, so you don't forget.

You can access your account here. If you can't remember your log in details, just follow the steps to create a new username or password. We will email you confirmation of any loan you make or a tax receipt of any donation.

Thank you for your contribution, with your help we can make poverty history! We look forward to seeing you back on the [NGO name] site soon.

Kind regards,

[Name and surname of COO]

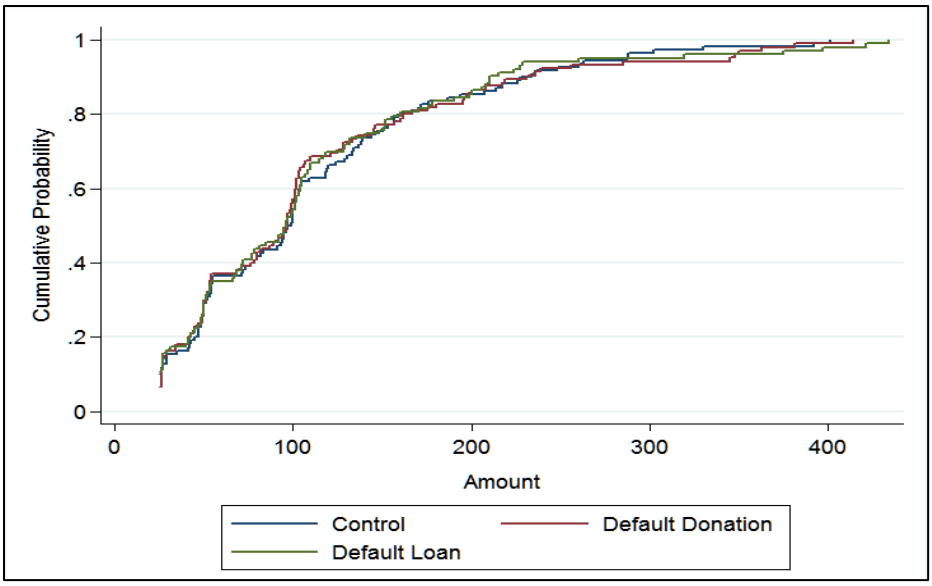
Chief Operating Officer, [NGO name]

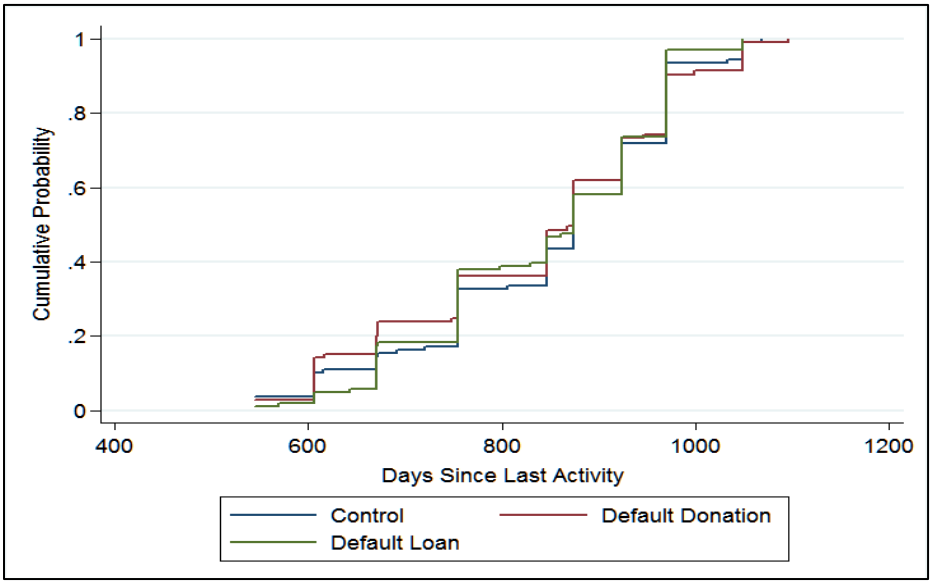
[NGO logo]

[NGO name]
[NGO postal address]

Like
Forward

B. Cumulative Distribution Function across Groups





C. Balance Checks

	(1)	(2)	(3)	(4)	(5)	(6)
	Control	Default Donation	Default Loan	(1)=(2)	(2)=(3)	(1)=(3)
Female	72%	72%	73%	0.9272	0.9443	0.8716
Idle Amount	111.5	111.3	110.2	0.9892	0.9241	0.9096
Days since last activity	847.5	834.5	841.2	0.4901	0.7201	0.7168

Values in columns (4), (5) and (6) report the *p*-values from two-tailed t-tests

D. Total Amount Given (OLS)

	(1)	(2)	(3)
Constant	-50.03**	5.582	49.97*
	(21.14)	(18.29)	(28.68)
Default donation	82.71***	-3.658	-62.76
	(7.030)	(9.717)	(38.05)
Default loan	79.46***	10.35	-67.24
	(7.061)	(9.758)	(41.79)
Female	9.367	8.328	8.029
	(6.540)	(5.463)	(5.447)
Days since last activity	-0.00806	-0.00975	-0.0605*
	(0.0220)	(0.0183)	(0.0312)
Idle Amount	0.694***	0.214***	0.204***
	(0.0345)	(0.0506)	(0.0507)
Default donation * Idle Amount		0.775***	0.787***
		(0.0695)	(0.0696)
Default loan * Idle Amount		0.621***	0.640***
		(0.0701)	(0.0706)
Default donation * Days since last activity			0.0684
			(0.0428)
Default loan * Days since last activity			0.0894*
			(0.0468)
Observations	318	318	318
R-squared	0.655	0.761	0.764
Default donation = Default loan	t(317): 0.1385	t(317): 0.1385	t(317): 0.1385
	p = 0.4450	p = 0.4450	p = 0.4450
Default donation * Idle Amount = Default loan * Idle Amount:		t(317): 0.1680	t(317): 0.1680
		p = 0.433	p = 0.433
Default donation * Days since last activity = Default loan * Days since last activity			t(317): 0.0801
			p = 0.468

(1) to (3) OLS models. Robust standard errors, clustered around lender unique ID, in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

E. Preferences for Way of Giving – Intrinsic Margin

	(1)	(2)	(3)
Constant	96***	110.5***	95.87***
	(26.66)	(0.447)	(27.74)
Donation Match:	9.439	-0.759	14.33
Default donation * (1 – loan dummy)	(28.31)	(1.031)	(26.76)
Loan Match:	11.26	-0.0397	15.07
Default loan * loan dummy	(27.95)	(0.956)	(26.77)
Donation Mismatch:	20	-14.47*	2.754
Default donation * loan dummy	(32.31)	(8.131)	(27.54)
Idle_c Amount		0.985***	
		(0.0133)	-
Female			-1.301
			(2.482)
Days since last activity			0.000688
			(0.00881)
Default donation * (1 – loan dummy) * Centred Ide Amount			1.000***
			(0.00262)
Default loan * loan dummy * Centred Idle Amount			1.002***
			(0.0103)
Default donation * loan dummy * Centred Ide Amount			0.882***
			(0.104)
Observations	209	209	209
R^2	0.002	0.9625	0.960
Test difference in giving when default conditions matched (i.e., Default Donation * (1 – loan dummy) = Default Loan * loan dummy)	F(1, 206)=0.02 p = 0.8861	F(1, 206)=0.32 p = 0.5734	F(1,206)=0.29 p = 0.5884
Test difference in giving when default conditions mismatched (i.e., Default Donation * (1 – loan dummy = Default donation * loan dummy	F(1, 206)=0.26 p = 0.6111	F(1, 206)=2.77 p = 0.0977	F(1,206)=2.85 p = 0.0927

Dependent variable is amount of money given via loans or donations, but considering only observations where this is positive – i.e. we dropped 207 observations where Amount given was equal to zero.
(1) to (4) OLS models. Robust standard errors, clustered around lender unique ID, in parentheses. Idle_c Amount omitted from model (3). *** p<0.01, ** p<0.05, * p<0.1

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Conclusions

This thesis shows how self-selection plays an important role in understanding how individuals behave and respond to incentives.

In the first two chapters I used a modified version of a common laboratory experiment, the gift exchange game, to show that workers reciprocate higher wage offers from employers by selecting them over a competitor, hence reducing their level of work effort as a consequence. This result can help reconcile the mixed evidence between field and lab experiments examining gift exchange. I also show how workers are more attracted and responsive to higher wage offers, rather than alternative types of incentives, such as social incentive. Further, I demonstrate how the wage offer of a competitor employer can influence worker's behaviour as a reference point. In the last chapter I show how self-selection also matters in the charitable giving context. I discuss this finding in relation to the design and implementation of defaults, and how they must reflect the decision-maker's preferences and past behaviour in order to be effective.

Behavioural economics – the growing field at the intersection of economics and psychology – has proven that individuals do not always behave in ways predicted by standard economic theory. We are influenced by biases that do not always allow us to make the best decisions for others and ourselves. Understanding human behaviour can improve the reliability of economic models and the effectiveness of public policies. This thesis contributed to this growing research field by showing that it is important to understand how and why individuals self-select and sort themselves into specific situations or contracts in order to design the right type of incentives and defaults. Behavioural scientists and policymakers can design more effective incentives and defaults by analysing self-selection and past behaviour. Lastly, this thesis also contributes to the growing field of experimental economics

literature. I show how results from laboratory experiments can be more easily generalised with the introduction of a sorting mechanism, and how the effectiveness of defaults can be tested using field experiments.

Additional Appendices

A. Study Instructions for Experiments in Chapters 1 and 2

Welcome and thank you for participating in this experiment.
You can keep the instructions with you during the whole experiment and you can refer to them at any time if needed.
Please note that during the entire experiment it is not allowed to talk to the other participants. If you have any questions or concerns, please raise your hand and ask us your questions quietly so others cannot hear. We will answer your questions individually. Please do not ask your question(s) aloud. If we think the questions asked are relevant to the group, we will repeat them and answer them for everyone. It is very important that you follow these rules, since otherwise we have to stop the experiment.
If you have not already done so, please turn off your mobile phones and any other electronic devices you have with you now and put everything under your desk.

Your Privacy

As specified in the Participant Information Statement and the Participant Consent Form, your identity and the identity of all other participants will remain anonymous. This means that your decisions will remain private information and no other participants will know the decisions you made during the experiment or how much you have earned.

Procedure

The experiment will last approximately 60 minutes and will include the following steps:

1. Read the instructions and the examples along in silence as I read them aloud
2. Answer a list of comprehension questions to make sure everyone understands the instructions and how the experiment works
3. Make decisions on your computer screen
4. Answer a short questionnaire about yourself and your experience in the experiment
5. Collect your final earnings in cash from the experimenter and leave

How you can earn money during the experiment

Your final earnings will be the sum of:

1. Your show up fee ($5)
2. Possible payments for correct answers to the comprehension questions
3. Your earnings based on the decisions you made during the experiment

Your earnings will depend on your decisions and the decisions of the other participants. Your earnings will be calculated in ECU (Experimental Currency Units), where 1 ECU = 0.05 AUD$. At the end of the experiment your total ECU earnings will be converted into Australian dollars and we will pay you in cash.

The decision tasks

At the beginning of the experiment, you will be randomly assigned to be in the role of an employer or the worker. You will stay in the allocated role for the whole experiment. It is very important that you familiarize yourself with both

roles because your payment will depend not only on your decisions but also on the decisions of participants in the other role.

The experiment consists of 10 rounds. Each single round follows this procedure: In each round two employers and one worker are randomly grouped together to form a triad. You will be randomly regrouped with different participants in each round so that you will never interact with the same participants more than one round in a row.

1. Each employer individually sets a wage and a percentage of his or her profits to donate to charity.
2. The worker observes both employers' decisions.
3. The worker is randomly matched to one of the two employers.
4. The worker chooses a level of work effort to provide to the randomly matched employer.
5. All members of the triad are informed about each other's decisions and relative earnings for that round.
6. Continue to the next round and repeat the steps above.

How you can earn money in each round

Earnings as an employer:
If you are assigned the role of the employer, in each round you will receive a starting capital of 120 ECU. You will be asked to make two decisions:

1. Offer a wage to the worker, and
2. Make a donation to charity

Wage: You can offer the worker any wage you prefer between 20 and 120 ECUs. The wage you offer will be deducted from your initial capital. For example, if you offer a wage of 20 ECU, you will have 100 ECU left; if you offer a wage of 36

you will have 84 ECU left; if you offer a wage of 120 ECU, you will have no remaining ECU left.

Donation: You can choose to donate any percentage of your profits from 0% to 100% to charity.

After all employers have chosen a wage and a percentage of profits to donate to charity, two employers and one worker are randomly grouped together.

The worker can see the decisions of the two employers and will be randomly and automatically matched to one of the two employers. If you are the employer, in every round there is an equal 50% chance that you will be matched to the worker.

If you are the employer who is not randomly matched to the worker in a round, you will earn nothing in that round.

If you are the employer who is randomly matched to the worker in a round, then your profits for that round will be equal to your remaining capital, (that is: 120 ECU minus the wage you offered to the worker) multiplied by the level of work effort the worker chooses, as expressed by the following formula:

- Profits of the employer = (120 ECU – offered wage) ∗ worker's effort

Your final earnings for the round will be your profits times the percent of your profits that you did not donate to the charity, as shown in the following formula:

- Earnings of the employer = (100% – percentage of profits donated to charity) * Profit of the employer, or in other words:
- Earnings of the employer = (100% – percentage of profits donated to charity) * (120 ECU – offered wage) ∗ worker's effort

Earnings as a worker:

If you are assigned the role of the worker, in each round you will see the wage offers and donations chosen by two employers randomly grouped with you.

A random process will then match one of the two employers to you. The chance you will be matched to one of the two employers in one round will be 50%. Thus,

no matter what choices each employer makes, you will be equally likely to be matched to either one of them.

Your decision is to select what level of work effort you would like to provide for the employer randomly matched to you.

You will choose the level of work effort on a scale from 0 to 1 in intervals of 0.1. Each level of work effort has a cost that will be deducted from the offered wage according to the following table:

Effort level *e*	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Cost of effort *c(e)*	0	0	1	2	4	6	8	10	12	15	18

If you are assigned the role of worker, when making your decisions you will be able to see the table above on your screen in each round. A value of 0 corresponds to no effort, 0.1 corresponds to very low effort, a value of 0.2 is a slightly higher effort level and so on, and a value of 1 represents the maximum level of work effort.

The worker's earnings are calculated according to the following formula:

- Earnings of the worker = offered wage − cost of effort

Referring back to the profits and earnings of the employer, note that:

The higher the chosen work effort, the higher the profits for the employer. If the employer chooses to donate 0% to the charity, then a higher effort choice would not increase the donation to charity. If you choose a level of effort equal to zero in a round, then your employer and the charity will not earn anything in that round.

Donation to charity

The money raised during this experiment will be donated to the charity 'Cure Brain Cancer Foundation'. 'Cure Brain Cancer Foundation' is the largest

dedicated funder of brain cancer research in Australia. Partnering with the research community, it is steering the national and global agenda for brain cancer research.

Founded in 2001 by a renowned neurosurgeon, the mission of the Foundation is to increase the five-year survival rate of people affected by brain cancer to 50% by 2023.

The objectives of the Foundation are to:

- Fund brain cancer research that offers patients accelerated access to promising new treatments
- Raise awareness of brain cancer
- Support the creation and implementation of a collaborative, international and multi-discipline brain cancer research community

The earnings of the charity on each round are calculated according to the following formula:

- Earnings of the charity = (percentage of employer's profits donated to charity) * the profit of the employer, or in other words:
- Earnings of the charity = (percentage of employer's profits donated to charity) * (120 ECU – offered wage) ∗ worker's effort

The earnings of the charity are thus influenced by not only the percentage of the employer's profits donated to charity, but also the wage offered by the employer and the level of work effort chosen by the worker.

At the end of the experiment we will sum the amount of money donated to charity across all 10 rounds by all participants matched in each round, and we will donate the total amount on behalf of all participants to the 'Cure Brain Cancer Foundation' online via the Foundation's website.

If you would like to receive a copy of the donation receipt you can provide your email to the experimenters on a separate form at the end of the experiment before

leaving. We will never be able to match your email with your decisions in the experiment. Remember that your decisions in this experiment will remain anonymous and the charity will not know the amount contributed by each participant.

We will now show you four examples to better explain how the experiment works.

Example 1

Every employer has an initial capital of 120 ECUs and can make a wage offer of any value between a minimum of 20 and a maximum of 120 ECUs.

A random process groups two employers with one worker.

Employer 1 offers a wage equal to 20 ECUs and chooses to donate 10% of profits to charity.

Employer 2 offers a wage equal to 70 ECUs and chooses to donate 20% of profits to charity.

The worker sees the two offers:

- Employer 1: 20 ECU wage offer and 10% of profits donated to charity
- Employer 2: 70 ECU wage offer and 20% of profits donated to charity.

A random process matches the worker to Employer 1.

The worker chooses a level of work effort equal to 0.1.

As a result of these choices, the outcome in this round is:

Earnings of Employer 1 = 9 ECU, based on the following calculation:

(100% – % of profits going to charity) * (120 ECU – offered wage) ∗ worker's effort.

Since Employer 1 chose 10% of profits to go to charity and offered a wage of 20 ECUs, and the worker provided effort of 0.1, we have:

Earnings of Employer 1 = (100% – 10%) * (120 ECU – 20 ECU) ∗ 0.1

which is equal to: 90% * 100 ECU * 0.1 = 9 ECU

Earnings of Employer 2 = Employer 2 earns nothing in this round because the other employer was randomly matched to the worker.

Earnings of the Worker = 20 ECU, based on the following calculation:

offered wage − cost of effort = 20 - 0 = 20 ECU

Earnings of the charity = 1 ECU, based on the following calculation:

% of profits going to charity * (120 ECU – offered wage) ∗ worker's effort

Which is equal to: 10% * 100 * 0.1 = 1 ECU

Example 2

Every employer has an initial capital of 120 ECU and can make a wage offer of any value between a minimum of 20 and a maximum of 120 ECU.

A random process groups two employers with one worker.

Employer 1 offers a wage equal to 40 ECU and chooses to donate 40% of profits to charity.

Employer 2 offers a wage equal to 50 ECU and chooses to donate 90% of profits to charity.

The worker sees the two offers:

- Employer 1: 40 ECU wage offer and 40% of profits donated to charity
- Employer 2: 50 ECU wage offer and 90% of profits donated to charity.

A random process matches the worker to Employer 2.

The worker chooses a level of work effort equal to 0.

As a result of these choices, the outcome in this round is:

Earnings of Employer 1 = Employer 1 earns nothing in this round because the other employer was randomly matched to the worker.

Earnings of Employer 2 = 0 ECU, based on the following calculation:

(100% – % of profits going to charity) * (120 ECU – offered wage) ∗ worker's effort = 10% * 70 * 0 = 0 ECU

Earnings of the Worker = 50 ECU, based on the following calculation:

offered wage − cost of effort = 50 - 0 = 50 ECU

Earnings of the charity = 0 ECU, based on the following calculation:

% of profits going to charity * (120 ECU – offered wage) ∗ worker's effort = 90% * 70 * 0 = 0 ECU

Example 3

Every employer has an initial capital of 120 ECU and can make a wage offer of any value between a minimum of 20 and a maximum of 120 ECU.

A random process groups two employers with one worker.

Employer 1 offers a wage equal to 80 ECU and chooses to donate 50% of profits to charity.

Employer 2 offers a wage equal to 100 ECU and chooses to donate 30% of profits to charity.

The worker sees the two offers:

- Employer 1: 80 ECU wage offer and 50% of profits donated to charity
- Employer 2: 100 ECU wage offer and 90% of profits donated to charity.

A random process matches the worker to Employer 2.

The worker chooses a level of work effort equal to 0.5.

As a result of these choices, the outcome in this round is:

Earnings of Employer 1 = Employer 1 earns nothing in this round because the other employer was randomly matched to the worker.

Earnings of Employer 2 = 1 ECU, based on the following calculation:

(100% – % of profits going to charity) * (120 ECU – offered wage) ∗ worker's effort = 10% * 20 * 0.5 = 1 ECU

Earnings of the Worker = 94 ECU, based on the following calculation:

offered wage − cost of effort = 100 - 6 = 94 ECU

Earnings of the charity = 9 ECU, based on the following calculation:

% of profits going to charity * (120 ECU – offered wage) ∗ worker's effort = 90% * 20 * 0.5 = 9 ECU

Example 4

Every employer has an initial capital of 120 ECU and can make a wage offer of any value between a minimum of 20 and a maximum of 120 ECU.
A random process groups two employers with one worker.
Employer 1 offers a wage equal to 100 ECU and chooses to donate 0% of profits to charity.
Employer 2 offers a wage equal to 30 ECU and chooses to donate 10% of profits to charity.
The worker sees the two offers:

- Employer 1: 100 ECU wage offer and 0% of profits donated to charity
- Employer 2: 30 ECU wage offer and 10% of profits donated to charity.

A random process matches the worker to Employer 1.
The worker chooses a level of work effort equal to 0.9.
As a result of these choices, the outcome in this round is:
Earnings of Employer 1 = 18 ECU, based on the following calculation:
(100% – % of profits going to charity) * (120 ECU – offered wage) ∗ worker's effort = 100% * 20 * 0.9 = 18 ECU
Earnings of Employer 2 = Employer 2 earns nothing in this round because the other employer was randomly matched to the worker.
Earnings of the Worker = 85 ECU, based on the following calculation:
offered wage − cost of effort = 100 - 15 = 85 ECU
Earnings of the charity = 0 ECU, based on the following calculation:
% of profits going to charity * (120 ECU – offered wage) ∗ worker's effort = 0% * 20 * 0.9 = 0 ECU

Comprehension questions

We will now ask you a series of comprehension questions to make sure all participants understood the instructions correctly. While answering these

questions, and during the entire experiment, you may review the instructions that we have just read.

Once everyone has completed the questions, we will then read all the questions and answers aloud. At the end of the experiment, you will find out how many you got correct.

At the end of the experiment we will randomly pick one participant who will be paid an additional AUD$1 for every question she/he answered correctly. The way we will randomly pick one participant is as follows: when you signed in at the entrance you were given a small piece of paper with your pc number on it; at the end of the experiment we will ask everyone to put their numbers in a box and we will randomly pick one participant without looking. When we randomly pick a participant, each of you will have an equal chance of being chosen.

If you have any questions or concerns please let the experimenters know by raising your hand now, before everyone starts answering the comprehension questions. We will answer your questions individually. Please do not ask your question(s) aloud.

Please insert your computer number: _____

1. At the beginning of the experiment I will be randomly assigned the role of employer or worker and I will remain in that role for the whole duration of the experiment: [TRUE/FALSE]
2. If I am the employer I can offer any wage I want that is between 20 and 120 ECU: [TRUE/FALSE]
3. If I am the employer, I can choose any percentage of profits from 0% to 100% that I want to donate to charity: [TRUE/FALSE]
4. If the worker chooses a level of work effort equal to zero, the employer, and the charity earn nothing on that round: [TRUE/FALSE]

5. In each round I will be randomly grouped with two different participants so that I do not interact with the same people more than once in a row: [TRUE/FALSE]
6. If I am the worker, I will choose the percentage of the profits that the employer will donate to charity: [TRUE/FALSE]
7. At the end of each round I will be able to see the outcome of that round, including my earnings, the earnings of the persons randomly grouped with me and the earnings donated to charity: [TRUE/FALSE]
8. My decisions and the decisions of other participants will remain anonymous: that is, I will not be able to identify who in this room made what choices today, nor will any other participant in this room today learn what decisions I made. [TRUE/FALSE]
9. At the end of the experiment I will be paid in cash and you will receive $0.05 times the total number of ECUs that you have earned over all ten rounds [TRUE/FALSE]
10. The percentage of all employers' profits going to charity in each round will be summed and donated to 'Cure Brain Cancer Foundation' at the end of the experiment: [TRUE/FALSE]
11. The mission of 'Cure Brain Cancer Foundation' is to raise awareness about climate change: [TRUE/FALSE]

For questions 12 – 15, consider the following situation and answer the following questions.

In one round, consider the following scenario:

Employer 1 offers a wage of 20 ECU and will donates 50% of profits to charity

Employer 2 offers a wage of 100 ECU and will donate 10% of profits to charity.

If the worker is randomly matched to Employer 1 and chooses a level of effort of 0.7 (which recall has a cost of 10 ECU), what would be the earnings of the worker and Employer 2?

12 Earnings of the worker: _____

13 Earnings of Employer 2: _____

In one round, consider the following scenario:

Employer 1 offers a wage of 20 ECU and will donates 10% of profits to charity

Employer 2 offers a wage of 100 ECU and will donate 50% of profits to charity.

If the worker is randomly matched to Employer 2 and chooses a level of effort of 1 (which recall has a cost of 18 ECU), what would be the earnings of employer 2 and the charity?

14 Earnings of Employer 2: _____

15 Earnings of the charity: _____

Once you have answered all the comprehension questions, please click the OK button below to see the correct answers. Once everyone has submitted their answers, we will read the correct answers aloud.

Correct answers (read aloud)

1. The correct answer is TRUE. At the beginning of the experiment you will be randomly assigned the role of employer or worker and you will remain in that role for the whole duration of the experiment (that is, 10 rounds).
2. The correct answer is TRUE. If you are the employer, you can offer any wage you want that is between 20 and 120 ECU.

3. The correct answer is TRUE. If you are the employer, you can choose to donate any percentage of profits you want to charity. This money will be donated to the charity at the end of the experiment.
4. The correct answer is TRUE. If the worker chooses a level of effort equal to zero, the employer and the charity earn nothing on that round.
5. The correct answer is TRUE. In each round, you will make decisions on your computer screen with two randomly grouped participants. You will be randomly grouped with new participants in each round, so that you never interact with the same participants more than once in a row. Your identity, and the identity of all other participants, will remain anonymous.
6. The correct answer is FALSE. If you are the worker, you do not choose the percentage of the employers' profits donated to charity. The employer chooses this percentage.
7. The correct answer is TRUE. At the end of each round you will be able to see the outcome of that round, including your earnings, the earnings of the other two persons randomly grouped with you and the earnings donated to charity.
8. The correct answer is TRUE. Your decisions and the decisions of other participants will remain anonymous.
9. The correct answer is TRUE. At the end of the experiment you will be paid in cash in Australian dollars the total sum of all payoffs of your decisions, and we will convert each ECU you have earned into $0.05.
10. The correct answer is TRUE. The percentage of all employers' profits going to charity on each round will be summed and donated to 'Cure Brain Cancer Foundation' at the end of the experiment
11. The correct answer is FALSE. The mission of 'Cure Brain Cancer Foundation' is not that of raising awareness about climate change but to support brain cancer research

12. Earnings of the worker: 10
13. Earnings of Employer 2: 0
14. Earnings of Employer 2: 10
15. Earnings of the charity: 10

If you have any questions or concerns at this stage please raise your hand and we will come to your desk.
If you do not have any question, you can click on the OK button to begin the experiment.

D. Final Questionnaire

Thank you for making your decisions.
We have some questions about you and your experience in this experiment that should only take another two minutes to complete.

1. The instructions were clear and easy to understand:

- Strongly agree
- Agree
- Disagree
- Strongly disagree

2. It was easy to understand my options in the different rounds:

- Strongly agree
- Agree
- Disagree
- Strongly disagree

3. I am:

- Male
- Female
- Prefer not to say

4. Year you were born: [scroll-down menu]
5. What is your level of study?

- Undergraduate
- Post-graduate
- MPhil/PhD
- MBA/MPA

6. What is your major field of study? [Drop-down menu list]
7. Have you heard of ‘Cure Brain Cancer Foundation’ before this study?

- Yes
- No

8. How much do you agree or disagree with the following statement: The ‘Cure Brain Cancer Foundation’ does important work for humanitarian aid assistance”

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

9. Have you ever made a donation to ‘Cure Brain Cancer Foundation’ before today?

- Yes
- No

10. How many times have you made a donation to any charity in the past 12 months?

- Never
- Once
- Between two and three times
- Between four and ten times
- More than ten times

11. How much money have you donated to charity in the past 12 months?

- I didn't donate to charity in the past 12 months
- Less than $10
- Between $10 and $50
- More than $50

12. On average, how much money do you spend per week, excluding food and housing?

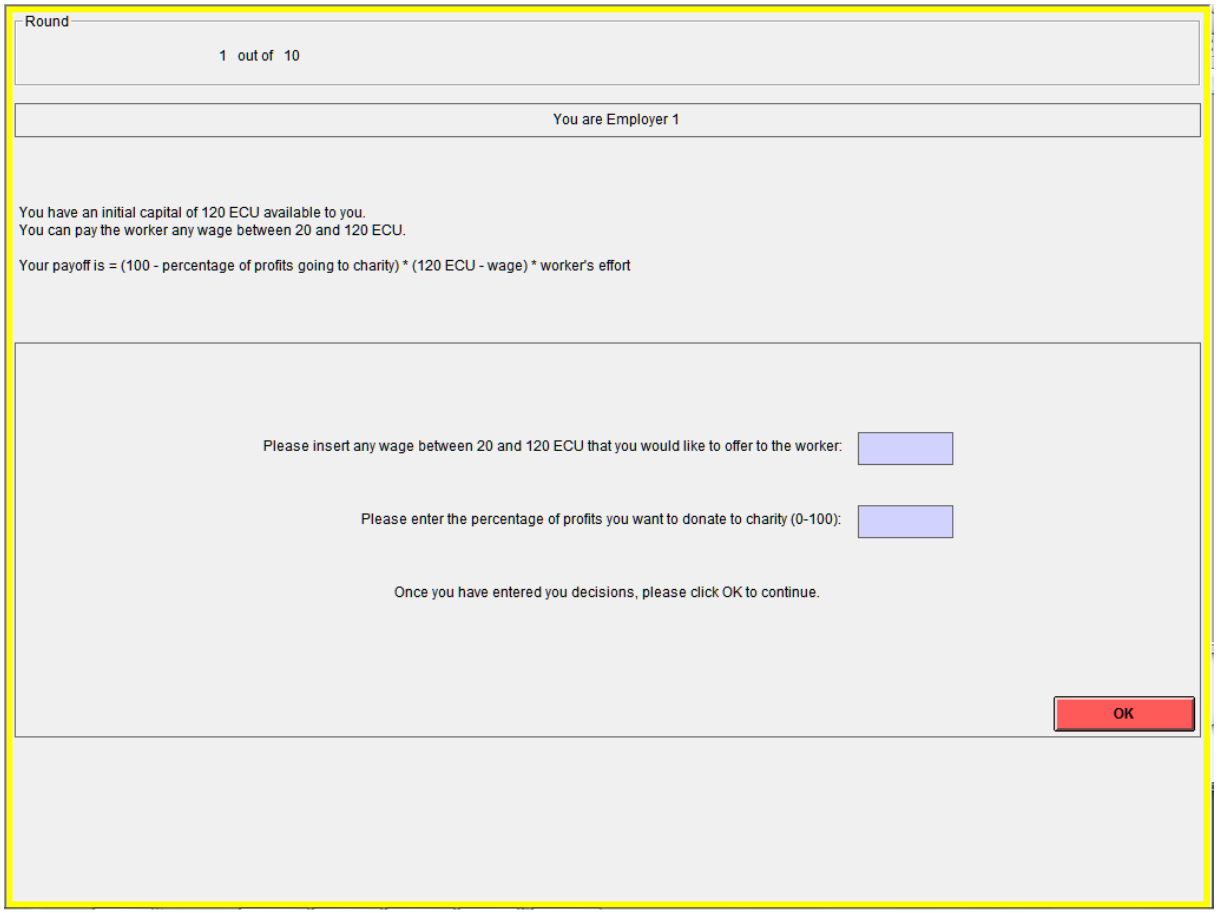
- Less than $40
- $40-$60
- $60-80
- $80-100
- $100-150
- More than $150

13. How much do you agree or disagree with the following statement: "I felt I could trust the experimenters"

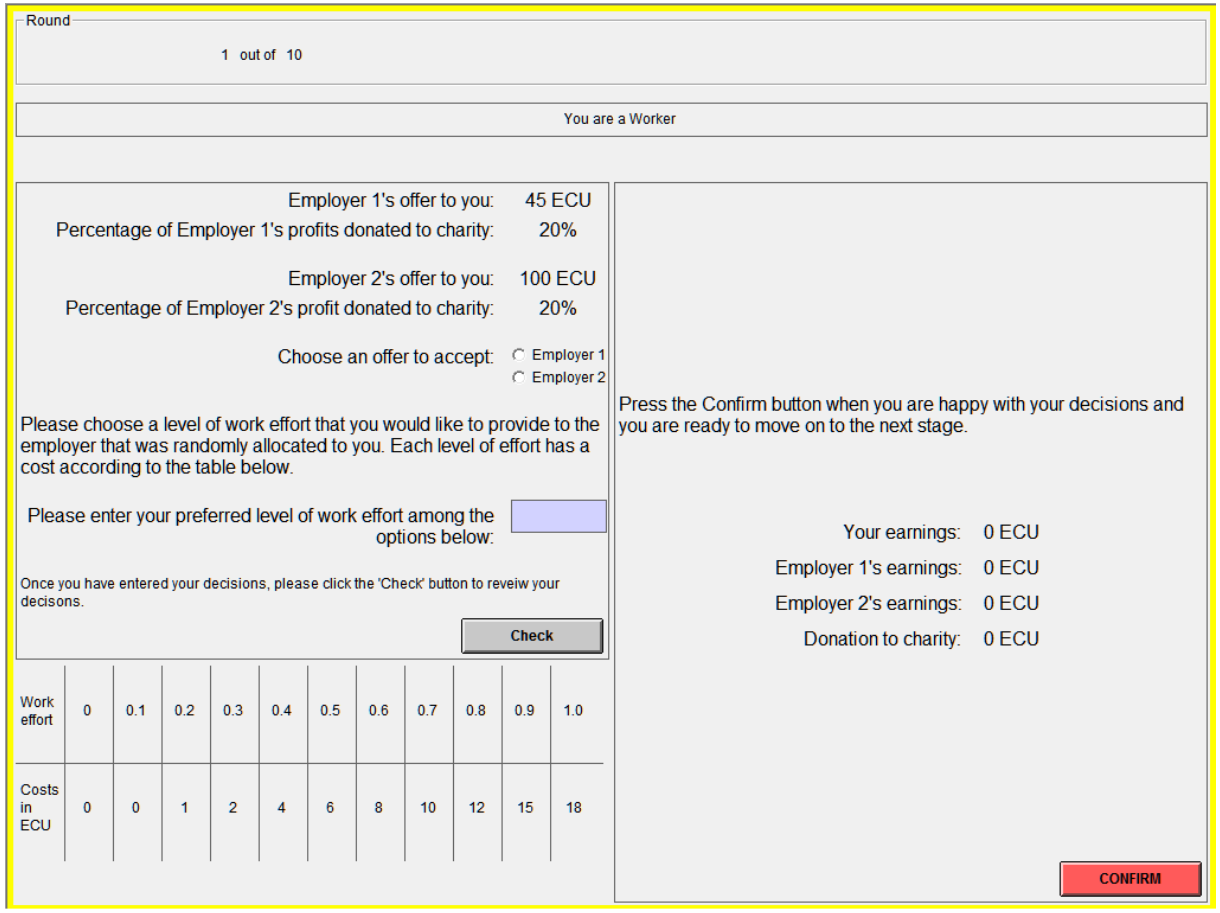
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

B. z-Tree Screenshots

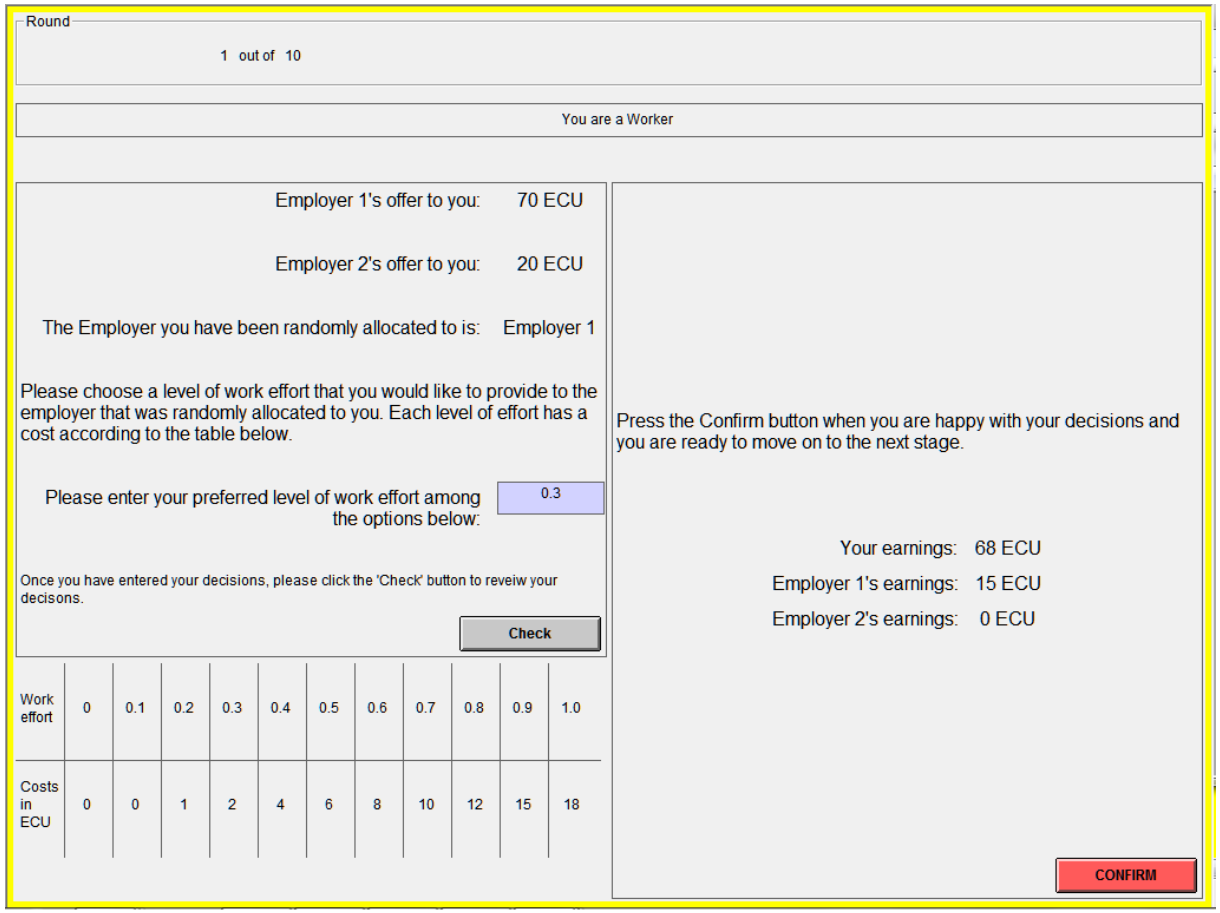
Employer's screen in Experiment of Chapter 1



Worker's screen in Experiment of Chapter 1 (Competition condition – i.e. sorting and social incentives)



Worker's screen in Experiment of Chapter 2 (Non-competition condition – i.e. reference-wage effect)



Every player's screen between one round and the next (stranger design reminder)