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**Working Paper**

## Who Benefits from Corporate Social Responsibility? Reciprocity in the Presence of Social Incentives and Self-Selection

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# Who Benefits from Corporate Social Responsibility? Reciprocity in the Presence of Social Incentives and Self-Selection

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## ABSTRACT

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# Who Benefits from Corporate Social Responsibility? Reciprocity in the Presence of Social Incentives and Self-Selection\*

Firms can donate a share of profits to charity as a form of corporate social responsibility (CSR). Recent experiments have found that such initiatives can induce higher effort by workers, generating benefits for both sides of the labour market. We design a novel version of the gift-exchange game to account for self-selection, and find that wages remain the most effective incentive to attract and motivate workers, with corporate donations playing a smaller role than previously suggested. We also show that firms substitute donations to charity with lower wage offers, keeping their profits constant but reducing workers' earnings. Initiatives of corporate philanthropy can thus be marginally beneficial for firms, but considerably costly for workers.

**JEL Classification:** D64, C91, M52

**Keywords:** gift exchange, reciprocity, corporate philanthropy, self-selection

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# 1 Background

An increasingly common trend for firms around the world is to engage in initiatives of *corporate social responsibility* (CSR), often by donating a share of profits to charity (KPMG, 2017). Recent studies suggest that these initiatives can be a strategic human resources tool to attract, retain, and motivate workers (Cassar and Meier, 2018), and their importance may be growing.<sup>1</sup> In an online real-effort experiment, Tonin and Vlassopoulos (2014) find that workers are more productive when they know that their work generates a donation to a charity of their choice. Koppel and Regner (2014) find a similar result in a modified gift-exchange game (Fehr et al., 1993), observing that workers work harder not only when wages are higher but also when donations to charity are higher. Kajackaite and Sliwka (2017) also find that the presence of CSR induces workers to work harder. In two online labour market experiments, Burbano (2016) find that simply informing prospective workers about the employer’s social responsibility reduces the amount of payment needed for workers to accept a job, suggesting that, in some contexts, CSR might be a substitute for higher wages.

In this paper, we argue that the literature might be mis-characterising the ability of CSR to attract and motivate workers. One limitation of these studies is the absence of a sorting mechanism – where workers can observe offers from potential employers, and choose one of them prior to exerting effort, as is often the case in real labour markets. Previous work has shown that individuals sometimes avoid putting themselves in situations where they will feel pressured to behave generously (Lazear et al., 2012), perhaps as a way to control their emotions (Andreoni et al., 2017), and that in the presence of sorting mechanisms, monetary incentives might be more effective than social incentives (DellaVigna and Pope, 2018). In a labour-market setting, Imas (2014) finds that when workers must choose whether their labour benefits themselves or a charity, they are willing to work for charity when the stakes are low, but not when they are high. Similarly, Fehrler and Kosfeld (2014) report that when workers can choose whether or not their effort generates a donation to charity, only a third

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<sup>1</sup>For example, according to a recent survey of workers at large US firms (Fast Company, 2019), 40 percent of millennials report that they have chosen a job because of company sustainability, compared to less than a quarter of generation X respondents and 17 percent of baby boomers. From the same survey, three-quarters of millennials report that they would be willing to accept a lower wage to work at an environmentally responsible company. Even though CSR in our experiment takes the form of donations to charity rather than environmental sustainability, these generational patterns are still suggestive.

of them choose a contract with CSR. However, Imas (2014) and Fehrler and Kosfeld (2014) cannot disentangle the role of financial versus social incentives in the presence of a sorting mechanism, and are unable to compare workers’ choices of employer and effort, and how these different payment schemes can affect their earnings.

Another limitation of this growing literature is that it has mainly concentrated on how workers behave in the presence of CSR, with less attention paid to the effects on employers. Previous studies have shown that CSR can be an effective tool for firms to increase sales (Chang, 2008; Gneezy et al., 2010), improve branding and lobbying power (Petrenko et al., 2016; Servaes and Tamayo, 2013; Bertrand et al., 2018), and more generally signal trustworthiness for marketing and recruitment purposes (Samek, 2019; Cassar and Meier, 2017, 2018; Fehrler and Przepiorka, 2016; Carpenter and Gong, 2016). However, evidence about the firm’s return on CSR investment, and hence the incentives to spend on it, is more limited and mixed. Hedblom et al. (2019) find that the presence of CSR attracts more productive workers who increase a firm’s profits by exerting higher effort at no extra wage, while Gosnell et al. (2020) find that pro-social incentives increase job satisfaction but not productivity. Further, List and Momeni (2020) warn of unintended moral licensing effects, where CSR can lead to higher cheating by workers, thus harming a firm’s profits. Cassar (2019) shows that while workers work harder in the presence of CSR, some employers take advantage of this intrinsic motivation by offering up to 20 percent lower wages, thus potentially harming workers.

Our contribution is threefold. Firstly, we introduce a sorting mechanism that improves generalisability and realism of our results. In one of our treatments, workers can view the wage (and, if applicable, CSR) offers of two firms, and choose which of the firms to work for, followed by the effort-provision decision typically found in gift-exchange settings. Thus, employers’ profits hinge on their ability to both attract and motivate workers. We compare this treatment to a baseline that resembles the more traditional design of the game: random assignment of workers to firms, followed by the worker’s choice of effort.

The justification for our “Choice” treatment is that workers are likely to respond to an employer’s financial and social incentives in a manner related to the reasons that led them to choose that job in the first place. However, the direction of this effect is ex-ante unclear.

It might be that “selection” dominates: workers choose jobs based on their individual preferences for wages and CSR, and these preferences also determine how they respond to wages and CSR in their effort decision. In other words, a charity worker might respond differently to CSR than an investment banker, but the latter is unlikely to have chosen a job with CSR as a major component of the incentive package. Alternatively, it might be that “crowding out” dominates: workers view their choice to work for an employer as a sufficient reward for that employer, and do not feel obligated to further reward the employer by exerting substantial effort. Our design enables us to study how workers choose firms based on the financial and social incentives they offer, and how this choice influences the effectiveness of these incentives on their subsequent effort provision.

Our experiment, by comparing treatments with and without worker sorting, also enables us to partially address conflicting findings on gift exchange between lab and field experiments. Specifically, field studies (Gneezy and List, 2006; Falk, 2007; Fehr and Goette, 2007; Levitt and List, 2007) have found less gift exchange than lab studies, and one potential explanation could be due to greater sorting and choice that workers have in the field than in the lab.

Our second contribution is that we focus not only on workers – as is common in this literature – but also on firms. When employers can offer both wages and CSR to prospective workers, they are deciding not only on the level of incentives, but also on their composition. Our multi-round experiment allows us to investigate how employers initially choose these incentives, as well as how they adjust them based on the worker responses they experience. We argue that the effectiveness of CSR initiatives depends in part on the firm’s objective, but in a complex way. For example, if a firm’s goal is to maximise donations to charity, it might increase wages to induce higher effort by workers, which increases profits and thus donation amounts; alternatively, the firm might decrease wages in favour of a larger fraction of profits promised for the charity. The appropriate choice will depend on how workers respond to the combination of wages and CSR. Previous studies have often focussed on this worker response, overlooking the impact that it has on a firm’s strategic behaviour (Koppel and Regner, 2014; Imas, 2014; Kajackaite and Sliwka, 2017; Cassar and Meier, 2017; List and Momeni, 2020).

Our third contribution is that we demonstrate the importance of ascertaining the effects of financial and social incentives on all stakeholders in the labour market – workers, firms,

and, where present, charities, to provide a comprehensive picture of the trade-offs involved in CSR. Studies that limit attention to one stakeholder risk missing the overall impact of CSR on the labour market. We also point to the importance of understanding how charities can better engage with firms to achieve joint social goals.

We find that under a sorting mechanism – that is, when firms compete for workers – it is mainly wages that matter to the workers. CSR, in the form of a share of the firm’s profits promised to charity, is only of secondary importance. Specifically, at the margin, a higher wage is up to five times more effective than a higher charity share to get workers to choose one firm over the other. We similarly find that wages are more effective than CSR to motivate workers to work harder. These findings contrast with those from previous studies, which have found that the choice between financial and social incentives is sensitive to stakes (Imas, 2014), which we do not observe, or that substituting CSR in place of higher salaries can work as a screening device for socially responsible workers (Fehrler and Kosfeld, 2014), for which we find no evidence.

We also find that when CSR is available, firms often use it, but they attempt to maintain their profits by decreasing wage offers to compensate for their expenditure on charity donations. This is in contrast to Cassar (2019) who finds that on average, employers do not significantly reduce wages to take advantage of workers’ intrinsic motives (though a subset of “nonmotivated” employers – those donating the least to charity in a separate decision stage – does reduce wage offers). Our study differs from Cassar (2019) in several ways; most notably, in our study the charity donations come directly out of firms’ profits, rather than as a bonus paid by the experimenter. Hence, firms offering more generous CSR will expect to bear the cost of it (as is true in corresponding settings outside the lab), and therefore face incentives to recover this cost by reducing wages. The net effect is that firms’ profits are not significantly reduced by CSR, even after accounting for the donations themselves. By contrast, workers’ earnings are significantly lower when CSR is available.

Taken together, our results show that CSR can benefit firms by helping to attract workers. It need not lower firms’ profits, since workers may be willing to accept lower wages from firms that donate a portion of profits to charity. This leads to reduced money earnings for workers, though since workers appear to have a taste for CSR, it is not certain that they are actually



worse off as a result. These results provide a more comprehensive, and perhaps critical, view of the trade-offs of CSR that might have been overlooked by previous studies.

## 2 Experiment design and research questions

Our experiment uses a modified version of the gift-exchange game (Fehr et al., 1993). There are two types of players: firms and workers. We use a 3x2 design where we vary (i) whether firms can offer to a worker only a wage, or both a wage and donation of a share of their profits to charity (CSR), and (ii) the way firms and workers are matched. Table 1 summarises the treatments, described below in more detail.

Table 1: Treatments

Treatment	No. of firms per worker	Matching	CSR (donations to charity)
Pair-noCSR	1	-	No
Assign-noCSR	2	Random assignment	
Choice-noCSR	2	Worker's choice	
Pair-CSR	1	-	Yes
Assign-CSR	2	Random assignment	
Choice-CSR	2	Worker's choice	

The game begins with each firm choosing a wage offer and – in our cells with CSR – a charity-share offer simultaneously.<sup>2</sup> The worker is informed of the offer(s) of either one firm (in our Pair treatment) or two firms (in our Assign and Choice treatments). The worker is matched with one of the two firms at random in the Assign treatment, or chooses one of the two in the Choice treatment. Finally, in all treatments, the worker chooses an effort level, after which the game ends.

A session of the experiment comprises ten plays of this game. In the experiment, the wage is restricted to integers between 20 and 120 (inclusive), the charity share is restricted to percents between 0 and 100 (inclusive), and the effort is restricted to integer multiples of

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<sup>2</sup>We use the term “CSR” to refer to our treatment in which donations to charity are possible, as well as the concept of corporate social responsibility more broadly. “Charity share” means the fraction (or percent) of profits an employer offers to donate to charity, and “charity proceeds” refers to the actual corresponding donation in the lab or in real money (i.e., the charity share multiplied by the employer’s profits). Workers observe the charity share offered by the firm (which, along with the worker’s effort, determines the actual charity proceeds) before making their decisions.

0.1 between 0 and 1 (inclusive), in line with previous gift-exchange game studies (Fehr et al., 1993, 1998).

The worker's (monetary) payoff is given by:

$$\pi_w = w - c(e) \quad (1)$$

where  $w$  is the wage offered by the (matched or chosen) firm,  $e$  is the worker's effort, and  $c(e)$  is the cost of effort (shown in Table 2). As usual, the worker's payoff increases in wage and decreases in effort.

Table 2: Worker's 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	1.0
Cost of effort $c(e)$	0	0	1	2	4	6	8	10	12	15	18

The firm's payoff is given by:

$$\pi_f = \begin{cases} (120 - w) \cdot (100 - \chi) \cdot e/100 & \text{if matched} \\ 0 & \text{if not matched} \end{cases} \quad (2)$$

where  $w$  is the wage offer,  $\chi$  is the percent share of profits given to the charity (equal to zero when there is no CSR), and  $e$  is the worker's effort. The proceeds going to the charity enter directly into the firm's payoff (but not the worker's payoff). Any firm that is not matched (in the Assign treatment) or not chosen by the worker (in the Choice treatment) earns zero in that round. The charity, which does not make any decisions, receives a payoff of:

$$\pi_c = (120 - w) \cdot \chi \cdot e/100. \quad (3)$$

Our baseline condition is the Pair-noCSR cell, which resembles the standard gift-exchange setting, with one firm and one worker randomly matched in each round, and with the firm offering only a wage (with no CSR choice). The Assign-noCSR cell is similar to the Pair cell except that (i) each worker sees two offers instead of one before being matched to one of them, and (ii) half of the firms in each round are randomly chosen to be unmatched. In the Choice cells, the worker sees two firms' offers as in the Assign cells, but chooses which firm to work for rather than this being randomly assigned. Corresponding CSR cells for

each condition differ only in whether donations to charity by firms are possible, so that the differences between the Choice-CSR, Assign-CSR and Pair-CSR cells are similar to those between the Choice-noCSR, Assign-noCSR and Pair-noCSR cells.

The equilibrium predictions – under standard (own-payoff maximising) preferences – are described in the Appendix, but we note two important facts here. First, in all sequential equilibria, the worker’s effort choice  $e$  does not exceed 0.1 (i.e., the worker always expends zero effort cost), and effort does not need to depend on the wage or charity share. Second, wage and charity-share offers do not need to vary across treatments.

Our first research question concerns the effects driven by the introduction of a sorting mechanism. One argument for allowing subjects to choose their partners in experiments is that outside of the lab, some individuals may choose either to place themselves in situations where they can behave more pro-socially, or to avoid such situations. For example, Lazear et al. (2012) show that some subjects are willing to pay a positive amount to avoid playing a dictator game (in the role of dictator), and that giving subjects the option to avoid the game results in less sharing overall, compared to a standard dictator game (where everyone plays). In a field experiment, Andreoni et al. (2017) demonstrate how individuals might avoid sorting themselves into situations where they feel they have to donate money, even if they normally would donate. In the context of labour markets, Dohmen and Falk (2011) show the importance of a sorting mechanism in a setting where workers can choose between a fixed and a variable payment scheme. Thus, it is reasonable to expect that sorting plays a role in determining the effectiveness of financial and social incentives, which is why it is worth exploring. Our first research question is thus:

*Question 1: What is the effect of firms’ competition (in the labour market) on wage offers, charity-share offers, and the earnings of firms, workers and charity?*

We expect that in the Choice treatment, workers will choose firms offering higher wages (other things equal), providing an incentive for firms to raise their wages in that treatment. If workers value contributions to charity, then there will be a similar incentive (though not necessarily of equal magnitude) to raise their charity shares as well. However, the resulting effects on the earnings of all stakeholders are less predictable. The direct effects of higher

wages are (ceteris paribus) a decrease in firm profits and increases in worker's payoffs and charity proceeds, and similarly for higher charity shares. However, gift exchange implies that workers will exert more effort when offered a higher wage (or charity share), with this indirect effect potentially offsetting the decrease in firm profits and increase in worker's payoffs. It is also possible that if firm profits decrease as a result of a sorting mechanism, this will offset the increase in charity proceeds from the higher charity share, leading to unpredictable directions of effects. Our second question is thus about the effects of CSR on the earnings of all stakeholders in the game, in contrast to previous studies which have mainly focussed on workers' decisions.

*Question 2: What is the effect of CSR on firms' profits, wage offers, and workers' earnings?*

Next, we are interested in understanding how workers choose a firm, and how they value wages and charity shares when the two incentives are offered as a bundle. Here again the predictions are ambiguous. If a worker does not value contributions to charity, CSR might have no effect at all. The direct effect of offering a share of profits to charity is a lower (net) profit for the firm, but this could be countervailed if charitable contributions induce higher worker effort, which in turn would decrease a worker's earnings. The expected effect of CSR on wages (which also impacts firm's profits and worker's earnings) will therefore depend on whether charity contributions and wages are viewed as substitutes or complements (respectively, tending to decrease or increase wages). Our third research question is thus:

*Question 3: When workers can choose a firm, are they more likely to choose firms that offer a higher wage or a higher charity share, and how do they trade off between the two?*

As previously noted, under employer competition (i.e., in the Choice cells) we expect that a firm is more likely to be chosen the higher are its offered wage and charity share. When the higher wage and the higher charity share are offered by different firms, the choice will depend on the worker's preferences over the two incentives, and possibly how much they differ between the firms.

Finally, in all cells the worker chooses her level of effort, which may also be affected by the firms' wage and charity-share offers. Our last question aims to understand these effects.

*Question 4: Which is more effective – a higher wage offer or a higher charity-share offer – in motivating workers to work harder, and does the answer depend on whether firms compete for workers?*

Gift exchange predicts that effort levels will be increasing in wage offers, and this is likely to extend to the charity share if workers value charity contributions. However, in the Choice treatment, workers have an earlier opportunity to reward firms by choosing them over a competitor, so reciprocation via effort may be attenuated in that treatment. In sum, when allowing firms to choose between wage offers and CSR, and when allowing workers to choose a preferred firm based on these two types of incentives, the effects on selection and effort of workers are unclear and worth studying more closely.

### 3 Experimental procedures

The experimental sessions were conducted at the University of Sydney Behavioural Computer Lab, and a total of 312 subjects took part (see Table 3 for session information). Subjects were recruited using ORSEE (Greiner, 2015) and could not participate more than once in the experiment; there were no other exclusion criteria. The validity of some lab experiments has been questioned partly due to participants being mostly students (Levitt and List, 2007). However, university students represent the ideal subject pool for our experiment for two reasons. First, university-educated workers are likely not only to be imminently involved in the labour market, but also to be competed for by employers. Second, our subjects were born in the mid-to-late 1990s, putting them at the tail end of the millennial generation. Business surveys have shown that CSR is of greater importance to millennial workers than older age cohorts (see, e.g., Footnote 1). Hence, studying the role of self-selection and the right mix of incentives used by firms to attract workers on this cohort of the population makes our findings more easily generalisable to other firm/worker settings.

The experiment was run on networked personal computers, and was programmed using

Table 3: Session information

Treatment	No. of sessions	No. of subsessions	No. of subjects	No. of firms (F) and workers (W)
Pair-noCSR	2	4	48	F=24; W=24
Assign-noCSR	3	6	54	F=36; W=18
Choice-noCSR	3	6	54	F=36; W=18
Pair-CSR	2	4	48	F=24; W=24
Assign-CSR	4	8	54	F=36; W=18
Choice-CSR	4	8	54	F=36; W=18

**Notes:** Each session was partitioned into two subsessions, which were closed to interaction (subjects were only grouped with other subjects in the same subsession).

z-Tree (Fischbacher, 2007). At the beginning of a session, subjects were seated in a single room and given written instructions, which were then read aloud in an attempt to make them common knowledge.<sup>3</sup> In the CSR cells, subjects were also given a one-page description of the charity, and were told that the experimenters would donate the sum of proceeds of the session on behalf of all participants.<sup>4</sup> After answering a series of comprehension questions to make sure all participants understood the instructions, the first round of play began.

At the start of the first round, subjects were randomly assigned to roles (firm or worker) and subsessions (subsets of the session which were closed to interaction, and thus can be regarded as independent of each other), that lasted for the duration of the experiment. Subjects played 10 rounds, followed by a short questionnaire about themselves and their experience in the experiment.<sup>5</sup>

The sequence of events within a round was as follows. First, subjects were assigned to groups of one firm and either one or two workers, with random re-matching each round.

<sup>3</sup>Screenshots of zTree decision screens are available in the Appendix. The study instructions and additional experimental materials, as well as the raw data from the experiment, are available from the corresponding author upon request.

<sup>4</sup>The charity we chose was Cure Brain Cancer Foundation, an Australian charity for research, awareness and advocacy involving brain cancer. Subjects were informed in the instructions that the donation would be made via the Foundation website, and copies of the donation receipt were available to students upon request. We chose a charity with a non-partisan mission that was not well known to participants to avoid influencing their decisions. Across all sessions, 85 percent of subjects reported not having heard of the charity before and 94 percent had never donated to the charity before the experiment. The end-of-experiment survey also asked participants: “How much do you agree or disagree with the following statement: The ‘Cure Brain Cancer Foundation’ does important work for humanitarian aid assistance” and we find that only 3 percent of participants disagreed.

<sup>5</sup>This questionnaire is also available upon request to the corresponding author. We note here that nearly all subjects reported that they found the instructions and experimental interface easy to understand.

Next, subjects in the role of firms were prompted to choose their wage offers, and in the CSR cells, their charity-share offers simultaneously. After these choices had been entered, subjects in the role of workers were informed of the wage offer (or in the CSR cells, the offered combination of wage and charity share) of each firm in their group, and in the Choice treatment, were prompted to choose one of the two offers, while in the Assign treatment, they were equally likely to be matched to either firm.

Then, workers were prompted to choose their effort levels. Importantly, to avoid confusion and simplify the game, after choosing a firm (where this was possible) and level of effort, workers could click on a button that displayed the payoffs for themselves, the firm and, in the CSR cells, the charity, before confirming their decision. Workers could change their decisions and recalculate payoffs as many times as they wanted before confirming. Once all workers confirmed their decisions, the round ended. Subjects received end-of-round feedback comprising all of the decisions within their group, and the payoffs of firm(s), worker and, in the CSR cells, charity. Once subjects had viewed these results, they could continue to the next round.

Payoffs in the experiment were denominated in Experimental Currency Units (ECU), and were converted to cash at the end of the session, at the rate of AUD 0.05 per ECU, with payments rounded up to the nearest dollar. Subjects also received a show-up fee of AUD 5. Average earnings were approximately AUD 18.50, and sessions typically lasted about 60 minutes. The sum of all charity proceedings over all CSR sessions was AUD 70.40.

## 4 Results

We begin our analysis by answering our first research question: whether introducing a sorting mechanism influences labour-market outcomes. Table 4 shows treatment-level aggregates, and Table 5 shows  $p$ -values from non-parametric tests of differences across treatments.<sup>6</sup> Throughout the paper charity shares are reported as percents, in the same way firms chose them in the experiment (i.e., a percent of profits to donate to charity). We pool data

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<sup>6</sup>Unless mentioned otherwise, our non-parametric tests use subsession-level data as our unit of independent observations, and two-tailed rejection regions. See Siegel and Castellan (1988) for descriptions of the tests we use, and Feltovich (2005) for critical values of the robust rank-order test.

from the Pair and Assigned treatments, as we found no significant differences between these treatments, and we will refer to them together as the “noChoice” treatment.<sup>7</sup> The similarities between the Assign and Pair treatments suggest that the introduction of a second firm on its own does not alter participants’ behaviour per se; rather, it is the sorting mechanism (in the Choice treatment) and the presence of CSR that influence decisions. In sum, the baseline values in the Assign and Pair cells allow us to compare these conditions to other studies that use a traditional design of the gift-exchange game (i.e., without sorting).

Table 4: Summary of decisions, by treatment

	noCSR		CSR	
	Choice	noChoice	Choice	noChoice
Wage offer	84.8	56.5	65.5	50.4
... given match	91.1	56.0	73.1	50.8
Charity-share offer			13.5	14.9
... given match			13.9	15.0
Effort (unconditional)	0.58	0.38	0.36	0.36
Worker earnings	82.5	50.9	68.8	46.2
Firm profit (given match)	14.5	21.3	13.8	17.7
Charity proceeds			2.8	5.0

**Notes:** Charity-share offers in percents. Effort levels in  $\{0.0, 0.1, \dots, 1.0\}$ . All other variables in ECU. “noChoice” = pooled Pair and Assign treatments.

The starkest result from Table 4 is the effect of worker choice. In the cells without CSR, worker choice leads to significantly higher wage offers overall, and an even larger difference in realised wages (i.e., conditional on being matched to the worker). Worker payoffs are also higher in the Choice cell, and firm payoffs are lower, both of these despite an increase in workers’ efforts.<sup>8</sup> In the CSR treatment, wages are also significantly higher in the Choice cells compared to the other cells, but this increase is only about half what it is in the treatments without CSR. We also see no difference in average efforts, making worker payoffs significantly higher in the Choice-CSR cell than in the other CSR cells. Donations to charity

<sup>7</sup>The only significant difference we observe between our Assign and Pair treatments is in unconditional firm payoff, which of course is driven by the design of these treatments (all firms are matched in the Pair treatment, while half of them are unmatched in the Assign treatment).

<sup>8</sup>Average worker efforts are included in these tables, as these averages are useful in explaining differences in firm profits and worker payoffs across treatments. However, to the extent that efforts depend on wages (as the gift-exchange hypothesis implies), these unconditional averages cannot distinguish between a treatment effect on efforts due to a treatment effect on wages, versus an effect due to other factors such as a change in the gift-exchange relationship. We will discuss workers’ effort choices in more detail in Section 4.2.



and firm payoffs are directionally lower when firms compete for workers than when they do not, though these differences are not significant.

Table 5: Pairwise comparisons of treatment effects on outcome variables

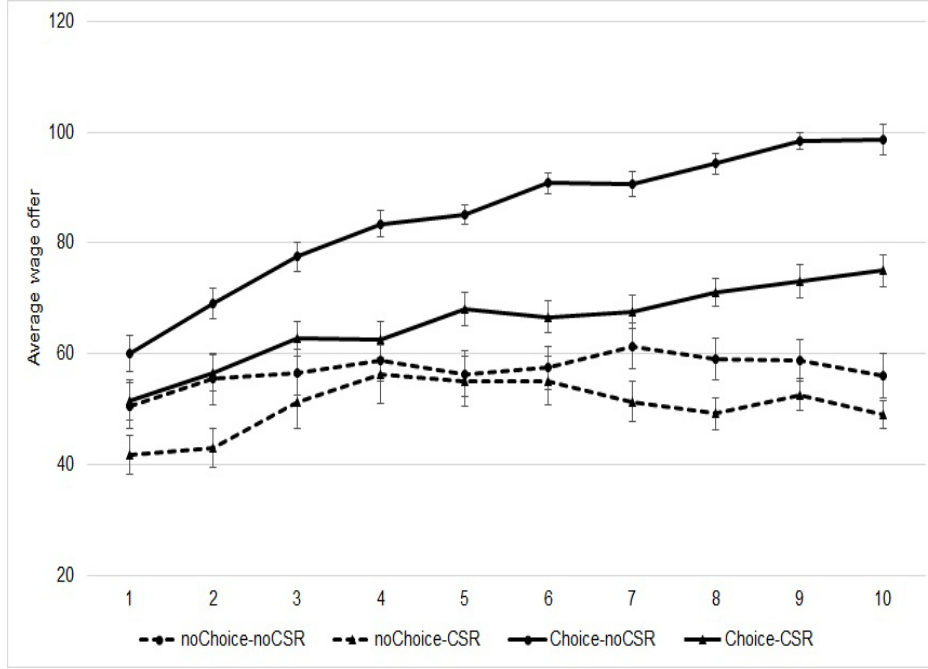
	Effect of worker choice		Effect of introducing CSR	
	Choice-CSR vs. noChoice-CSR	Choice-noCSR vs. noChoice-noCSR	Choice-CSR vs. Choice-noCSR	noChoice-CSR vs. noChoice-noCSR
Wage offer	$p \approx 0.001$	$p < 0.001$	$p < 0.001$	$p \approx 0.035$
... given match	$p < 0.001$	$p < 0.001$	$p \approx 0.001$	$p \approx 0.093$
Charity share	n.s.			
... given match	n.s.			
Effort (unconditional)	n.s.	$p \approx 0.001$	$p \approx 0.008$	n.s.
Worker earnings	$p < 0.001$	$p < 0.001$	$p \approx 0.010$	$p \approx 0.056$
Firm profit if matched	n.s.	$p \approx 0.017$	n.s.	$p \approx 0.055$
Charity proceeds	$p \approx 0.086$			

**Notes:** Significance tests are based on two-tailed robust rank-order tests at the subsession level. Non-significant results (n.s.) refer to value of  $p > 0.2$ .

Another set of notable results from Tables 4 and 5 concerns the effect of allowing firms to allocate a share of profits to charity. Introducing CSR lowers wage offers, workers' effort and workers' payoffs (though not significantly in the noChoice treatment for the last two variables). As a result, firm profits (net of charity proceeds) do not significantly decrease when CSR is possible.

Figures 1 and 2 show wage and charity-share offers for each cell over the ten rounds of the game. Figure 1 shows upward time trends for wage offers in the Choice cells, whereas wage offers are roughly stationary in the noChoice cells, suggesting that the treatment effect of worker choice gets larger over time. Figure 2 shows weak upward trends for charity offers in both CSR cells, but no evidence that the effect of worker choice in those cells changes over time. Also, the wider confidence intervals in this figure (relative to Figure 1) suggest that charity-share offers do not differ significantly according to whether firms compete over workers (consistent with the lack of significance in all-round levels, seen in Table 5).

Figure 1: Time series of firms' decisions: wage offers



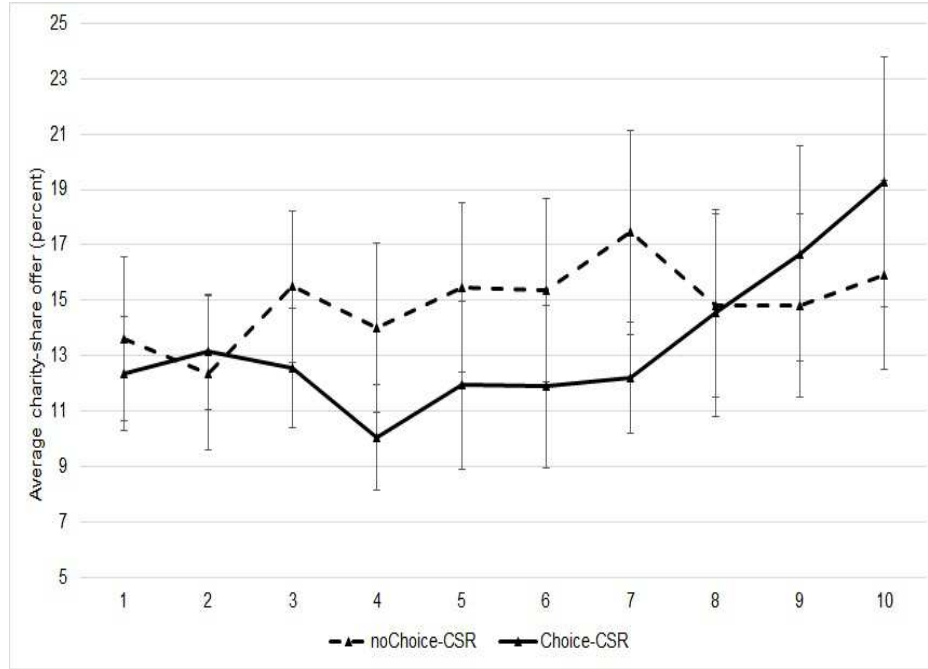
**Notes:** The figure shows the average wage offer (in ECU) in each round, for each cell of the experiment. Error bars represent 95-percent confidence intervals.

Further evidence of these treatment effects is shown in Table 6, which reports results from panel linear regressions on the disaggregated data.<sup>9</sup> The regressions for wage offers, firm profits and worker profits use data from all cells, while those for charity offers and charity proceeds use data from the CSR cells only. The right-hand-side variables are an indicator for the Choice treatment (with noChoice as baseline), the round number, and when applicable, an indicator for the CSR treatment. Also included are all two- and three-way interactions of these variables, a constant term, and subject random effects.

Table 6 shows the average marginal effect for each right-hand-side variable, along with conditional marginal effects for the Choice indicator (given a value for the CSR indicator of either 0 or 1) and for the CSR indicator (given a value for the Choice indicator of either 0 or 1). Consistent with the aggregate-level results from Tables 4 and 5 above, we observe that introducing worker choice of employers increases wages and worker payoffs, both when CSR is present and when it is not. Worker choice also reduces firms' profits, though the difference is only significant when CSR is not present.

<sup>9</sup>Tobit regressions yielded similar results to those reported here, as did a simultaneous-equation model of wage offer and charity offer for the CSR treatment (details from the corresponding author upon request).

Figure 2: Time series of firms' decisions: charity-share offers



**Notes:** The figure shows the charity-share offer (percent of profits) in each round, for each CSR cell. Error bars represent 95-percent confidence intervals.

**Result 1: Firms' competition for workers significantly increases wage offers and workers' earnings. Competition significantly decreases firms' profits and charity proceeds. It decreases charity-share offers, but not significantly so.**

The effects of allowing CSR similarly confirm the results from Tables 4 and 5. Firms appear to compensate themselves for charity donations by reducing wage offers, leading to lower worker earnings. Consequently, the availability of CSR has no significant effect on firms' profits, despite the obvious cost of the donations themselves.

**Result 2: When firms have the option to donate a share of profits to charity, this reduces wage offers and workers' payoffs but has no significant effect on firms' profits.**

This novel result complements the growing literature on the role of social incentives in the labour market. While most previous studies focussed on the behaviour of workers, in some cases to the extent of having the experimenters play the role of the employer (List and

Table 6: Marginal effects of treatments on outcome variables

<i>Dependent variable</i>	(1) Wage offer (ECU)	(2) Charity-share offer (percent)	(3) Firm profit (ECU)	(4) Worker earnings (ECU)	(5) Charity proceeds (ECU)
ME of Choice	21.730*** (2.225)	-1.462 (2.779)	-2.634*** (0.857)	27.106*** (1.920)	-2.279** (1.087)
...in noCSR	28.306*** -3.147		-3.595*** (1.224)	31.555*** (2.733)	
...in CSR	15.154*** -3.146	-1.462 (2.779)	-1.694 (1.22)	22.657*** (2.732)	-2.279** (1.087)
ME of CSR	-11.080*** (2.116)		-1.545 (0.985)	-7.422*** (1.707)	
...in noChoice	-6.148** (2.602)		-2.266 (1.492)	-4.752*** (1.991)	
...in Choice	-19.300** (3.61)		-0.344 (0.844)	-13.650*** (3.284)	
Round number	1.690*** (0.191)	0.404 (0.265)	-0.038 -0.065	1.276*** (0.219)	0.173 (0.114)
Sample	All firms	Firms in CSR cells	All firms	All workers	Firm/worker pairs in CSR cells
<i>N</i>	1920	960	1920	1200	600
R-squared	0.314	0.006	0.019	0.37	0.024

**Notes:** Panel linear marginal effects, based on random effects regressions with standard errors (in parentheses) clustered at subsession level.\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$

Momeni, 2020), we show that understanding the firm’s behaviour is of equal importance. Firms in the experiment appear to be protecting their profits, by reducing wage offers when social incentives are introduced. CSR is therefore costly to workers, at least in a monetary sense.

#### 4.1 Workers’ choice of employer

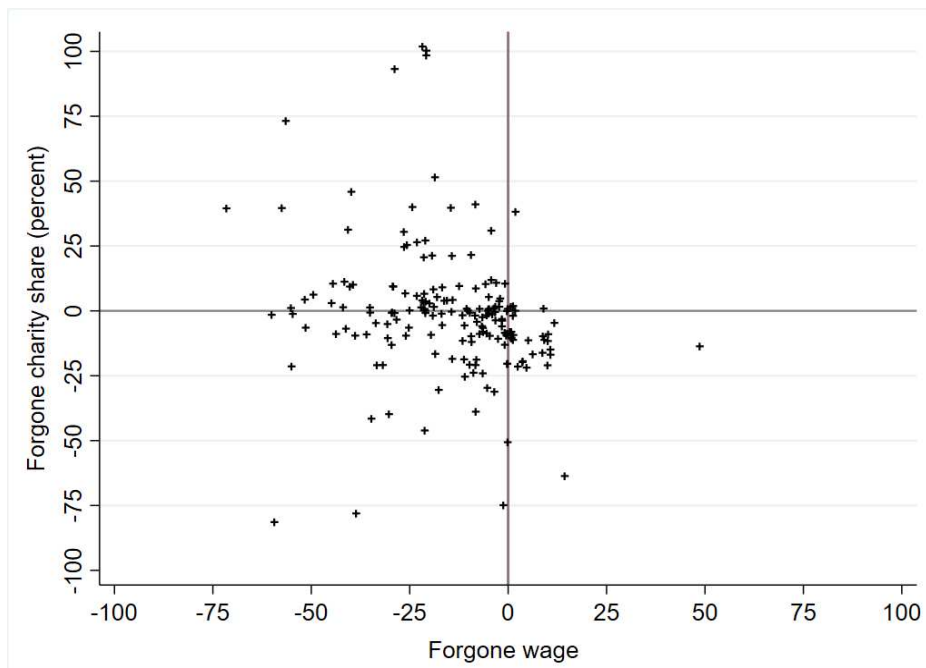
We now turn to workers’ behaviour. In the Choice treatment, workers make two decisions in each round: which firm’s offer to accept and what level of effort to exert. We focus on the former decision here, leaving the latter to Section 4.2.

In the treatments without CSR, firms can only offer wages to workers, and it is reasonable to expect that workers prefer higher to lower wages. Indeed, workers choose the higher wage offer 97.7 percent of the time when the offers differ, significantly more often than the 50

percent implied by random choice (Wilcoxon signed-ranks test,  $p = 0.008$ ).

In the Choice-CSR cell, firms can offer both a wage and a charity share (i.e., a percent of profits that will be donated to charity), both of which may matter to the worker. In particular, the worker may have to choose between a higher wage and a higher charity share. This makes understanding the worker’s decision more complex compared to traditional gift-exchange game settings. To begin the analysis, in Figure 3 we show the workers’ decisions for the Choice-CSR cell in a scatter-plot, with the foregone wage (i.e., the wage of the unchosen firm minus that of the chosen firm) on the horizontal axis and the foregone charity share on the vertical axis.

Figure 3: Worker’s preferences between forgone wage and forgone charity share



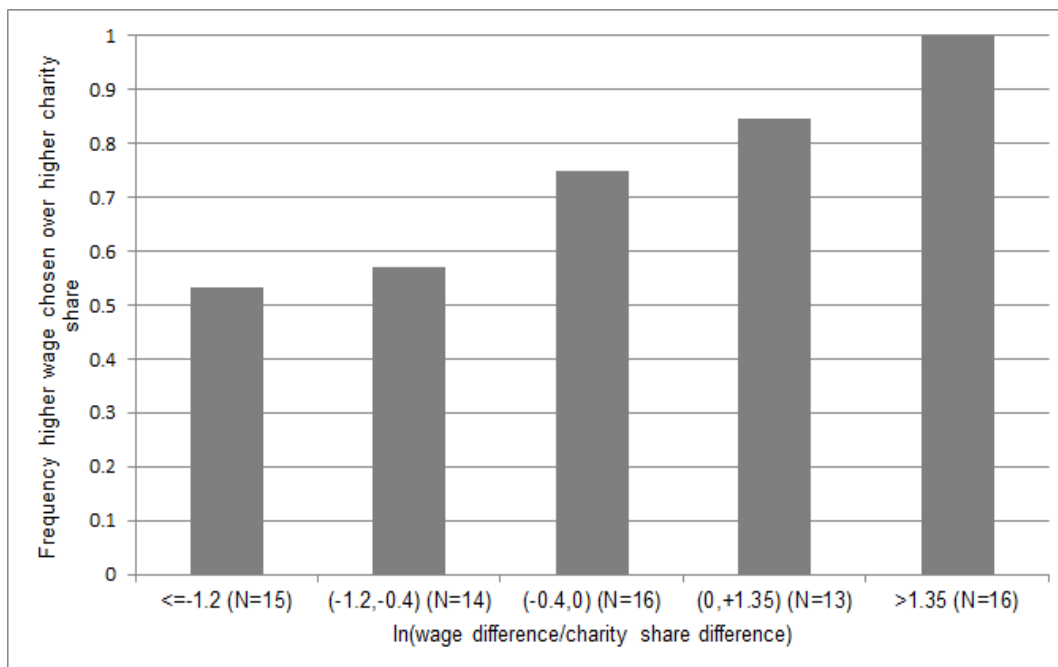
**Notes:** Each point corresponds to one worker decision in the Choice-CSR cell. The individual points are jittered by adding uniform  $[-2,2]$  random noise to each component, to reduce the chance that multiple observations with the same coordinates obscure each other.

In cases where one firm offered both the higher wage and the higher charity share, that firm was chosen by the worker 100 percent of the time (52/52). Firms were also very likely to be chosen when they offered a higher wage and an equal charity share (96.9 percent of the time, 31/32) or a higher charity share and an equal wage (93.8 percent, 15/16). In cases where one firm offered a higher wage and the other firm offered a higher charity share – so that the worker had to choose one or the other – the higher wage was chosen over the higher

charity share 74.3 percent of the time (55/74). This suggests that wage offers remain the most important incentive to attract workers.

To further disentangle the effects of wage and charity share, in Figure 4 we map the cases where the higher wage and the higher charity share are offered by different firms. We can see not only that workers choose firms with higher wage offers, but also that they are sensitive to the relative difference between wage offers and charity shares. When only a small amount of wage must be foregone to gain a large charity share, workers are roughly equally likely to choose either the higher wage firm or the higher CSR firm; but when the wage difference is much more than the difference in charity shares, workers always choose the firm offering the higher wage.<sup>10</sup>

Figure 4: Worker choice between firm offering a higher wage and firm offering a higher CSR



**Notes:** The figure shows the choice of workers between higher-wage and higher-CSR firms in the Choice-CSR cell. On the horizontal axis we plot the (logarithmic) ratio of magnitudes of the difference in wages and the difference in charity shares between the two firms that were paired on each round. We then group them based on approximate quintiles for easier reference. On the vertical axis, we report the frequency with which workers chose the higher wage over the higher charity share.

The positive association between these variables is confirmed by a probit regression using

<sup>10</sup>We also estimated a probit with a dummy for the higher-wage firm chosen by the worker as the dependent variable, and the log-ratio of wage difference and charity-share difference as the independent variable. The marginal effect of the log-ratio was significantly positive (+0.131,  $p$ -value of 0.019 using clustering by subsession, pseudo-R-squared 0.133), confirming the positive association between these variables.

the worker-level data from the Choice-CSR cell. The dependent variable is an indicator for the firm labelled as Firm 1 being chosen by the worker. The independent variables are the log of the wage ratio  $\ln(w_1/w_2)$  and the log of a scaled charity-share ratio  $\ln[(20 + \chi_1)/(20 + \chi_2)]$ ; we do not use a constant term.<sup>11</sup> The results are shown in Table 7.

Table 7: Marginal effects of wage and charity-share offer ratios on worker choice of firm ( $N = 180$ )

	ME of $\ln(\text{wage ratio})$	ME of $\ln(\text{CSR ratio})$	Wald test
Firm 1 chosen	1.113*** (0.130)	0.239*** (0.072)	$p < 0.001$
<b>Notes:</b> Probit MEs and clustered standard errors. *** : $p < 0.01$ .			

Both marginal effects are positive and significant, indicating that both higher wages and higher charity shares make a firm more likely to be chosen by the worker. However, the marginal effect of the log wage ratio is significantly higher than that of the log charity share ratio, reflecting a greater importance placed by workers on wages than charity donations.

The model estimated in Table 7 has a straightforward structural interpretation. Consider the Cobb-Douglas utility function

$$U(w, \hat{\chi}) = \alpha \cdot \ln(w) + \beta \cdot \ln(\hat{\chi}) \quad (4)$$

where  $w$  and  $\chi$  denote the wage and (re-scaled) charity share respectively, and  $\alpha$  and  $\beta$  are non-negative constants. Suppose that the likelihood of the worker choosing Firm 1 is a function of the difference in utilities between Firm 1's (wage, charity share) offer and Firm 2's offer:

$$Prob(\text{Choose Firm 1}) = g[U(w_1, \hat{\chi}_1) - U(w_2, \hat{\chi}_2)] \quad (5)$$

Finally, estimate  $\alpha$  and  $\beta$  assuming  $g$  is the probit function, and adding an error term. Note

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<sup>11</sup>Recall that charity shares range from 0 to 100 percent. We scale them by adding 20 when computing this ratio for two reasons: (1) to avoid dividing by zero, and (2) for comparability with wages, which range from 20 to 120. For robustness, we estimated the model in Table 7 by adding 1 instead of 20 to charity shares, with similar results to those reported here (details available from the corresponding author).

that (4) and (5) imply:

$$Prob(Choose\ Firm\ 1) = g \cdot \left[ \alpha \cdot \ln \left( \frac{w_1}{w_2} \right) + \beta \cdot \ln \left( \frac{\hat{\chi}_1}{\hat{\chi}_2} \right) \right] + \varepsilon \quad (6)$$

where  $\varepsilon$  is the error term. This is exactly the probit model estimated in Table 7, and the coefficients corresponding to the reported marginal effects reported there are  $\alpha = 5.433$  (s.e. 0.787) and  $\beta = 1.166$  (s.e. 0.283). Thus workers are sensitive to both higher wage offers and CSR (i.e., charity shares), but the former is up to five times as large as the latter.<sup>12</sup>

**Result 3: Workers nearly always choose the higher-wage firm and the higher-charity-share firm when there is no trade-off between the two. When there is a trade-off, they are more likely to choose the higher-wage firm than the higher-charity-share firm, but the likelihood of choosing the latter increases with the difference in charity shares, and decreases as the difference in wages increases.**

This result suggests that when workers are allowed to choose, they generally select the firm offering a higher wage rather than a higher charity share. Further, workers are sensitive to the sizes of the differences in wage offers and in charity donations between the two firms.

## 4.2 Workers' effort choices

In other studies employing the gift-exchange game, the extent of gift exchange is based on the relationship between the firm's wage offer and the worker's effort level. Any effort above the payoff-maximising level (which typically involves zero effort cost to the worker) can be attributed to a sense of reciprocity driven by a generous wage offer. In our data, we see that effort levels of 0 or 0.1 (the effort levels incurring a zero effort cost) account for about 37 percent of workers' efforts overall, ranging from 15 percent in the Choice-noCSR cell to 44 percent in the Pair-CSR cell. While this is clearly a substantial fraction of worker choices, the fact that most observations involve higher effort – and are therefore not consistent with equilibrium play under standard preferences – suggests that non-pecuniary considerations are important in understanding workers' behaviour.

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<sup>12</sup>In the Appendix we provide an alternative analysis that uses the wage offer and charity share of a single firm, rather than the ratio of two firms' offer, and show that we obtain qualitatively similar results.



However, the measure of gift exchange in our experiment is more complex. First, firms in our CSR treatment can offer charity shares as well as wages; if workers value charitable donations, their effort levels should depend on both wages and charity shares, raising the question of how to aggregate them. Second, workers in our Choice treatment can reciprocate attractive offers not only through higher effort, but also by choosing a firm over its rival, potentially attenuating a worker’s sense of reciprocity when subsequently providing effort. Third, since wages are substantially higher in the Choice treatment (Table 4), and the difference grows over time (Figure 1), it is important to ensure that comparisons of gift exchange between Choice and noChoice are not reliant on extrapolation outside the samples, as would happen if there were little or no overlap in the two wage distributions.

Regarding the first complication, we consider two ways of aggregating wages and charity shares. The first of these exploits our analysis from the previous section, where we essentially estimate a utility function for workers. We define the “worker utility index” as:

$$worker\ utility\ index = w \cdot \hat{\chi}^{1.166/5.433} - 20 \cdot 20^{1.166/5.433} \quad (7)$$

which is the gain in utility (after taking a monotonic transformation of (4)) for the worker over the minimum possible utility – based on a wage of 20 and charity share of 0 (and hence an adjusted charity share of 20, as noted in the previous section). The associated gift exchange is the relationship between the worker’s effort and the value of this index (which depends on the wage and charity share). The “gift” from the firm to the worker is measured in terms of this index, while the “gift” from the worker to the firm is, as usual, the worker’s effort.

Our second way of aggregating wages and charity shares utilises Equation 2 in Section 2: the firm’s profit function. In that equation, profit divided by the worker’s effort is a weakly decreasing function of both the wage and charity share. So, a measure of how much profit the firm sacrifices by offering a given wage  $w$  and charity share  $\chi$ , per unit of worker effort, is:

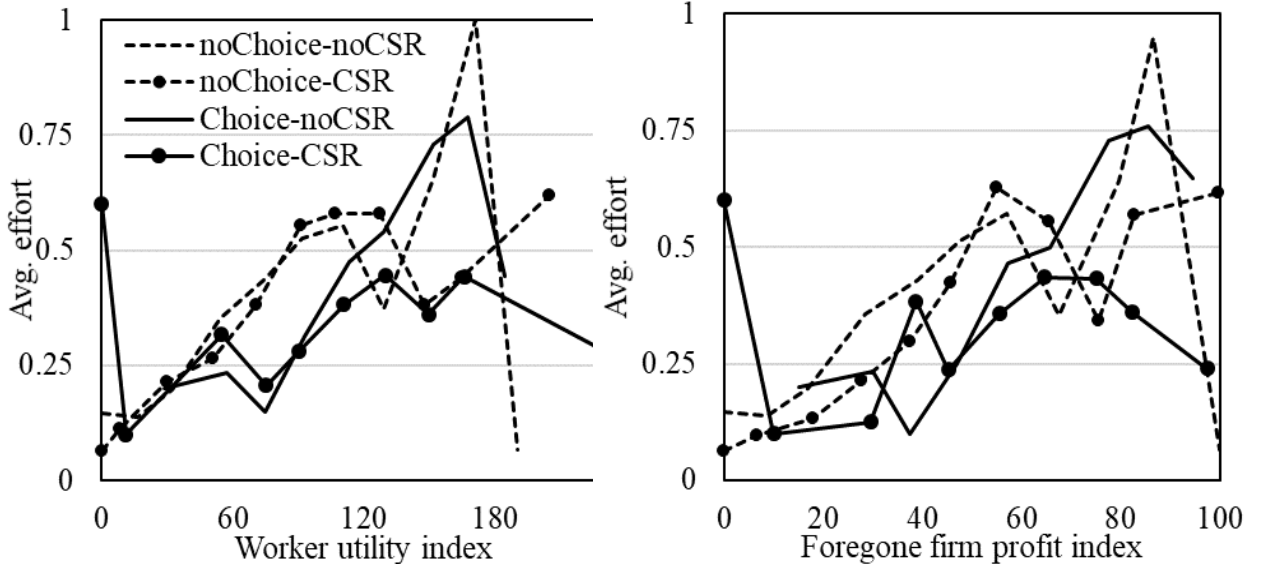
$$forgone\ firm\ profits = [(100) \cdot (100) - (120 - w) \cdot (100 - \chi)]/100 \quad (8)$$

which is proportional to the difference between the profit associated with the offered wage

and charity share, and the (higher) profit from the minimum wage of 20 and minimum charity share of 0. The corresponding gift exchange is the relationship between the worker’s effort (the “gift” to the firm) and this measure of foregone profit (the “gift” to the worker).

The two resulting gift-exchange relationships are displayed in Figure 5.<sup>13</sup> Both panels have one of the gift-to-worker indices on the horizontal axis and worker effort on the vertical axis, and the relationships are shown separately for each of the four cells.<sup>14</sup> To reduce cumbersome wording, we refer to the two indices on the horizontal axis collectively as “firm generosity”, though clearly firms can choose high levels of wage and CSR for reasons other than generosity.

Figure 5: Gift exchange: worker effort and firm generosity



**Notes:** The figure shows the relationship between worker effort and the two measures of firm generosity described in the text, separately for each cell of the experiment.

In all of the graphs, we see evidence of the usual gift-exchange relationship, with higher

<sup>13</sup>A third way of aggregating wage and charity share would be to simply ignore the charity share and use the wage alone as the “gift” to the worker. Such an approach has the advantages of comparability to previous work and conformity to standard theory (as noted in (1), this is the actual monetary earning a subject would receive as worker). It turns out that results using this method are nearly identical to those using the foregone firm profit index; hence to save space, we omit them from the paper.

<sup>14</sup>To make the relationships easier to observe, we combine observations with similar horizontal coordinates. For the worker utility index, the bins we use are  $(-\infty, 20]$ ,  $(20, 40]$ , ...,  $(160, 180]$  and  $(180, \infty)$ . For the foregone firm profit index, we use  $(-\infty, 0]$ ,  $(0, 20]$ , ...,  $(80, 90]$  and  $(90, \infty)$ . Then, for each bin, we average the horizontal coordinates and the vertical coordinates for all observations in that bin and plot a point with those coordinates.

firm generosity associated with higher worker effort. However, the relationship appears to break down at the highest levels of firm generosity, with effort levelling off or even decreasing. This is not paradoxical: as firm generosity increases, the relationship between worker effort and firm profit becomes flatter (recall from (2) that for a firm that is matched, its profit is  $(120 - w) \cdot (100 - \chi) \cdot e$ ; the derivative in  $e$  is decreasing in both  $w$  and  $\chi$ ), while the cost of effort is unchanged. In the extreme case where  $w = 120$  or  $\chi = 100$ , worker effort does not benefit the firm at all, while it is still costly. Therefore, a rational worker with other-regarding preferences may reduce effort when firm generosity is very high.<sup>15</sup>

At first glance, we do not see systematic differences in the gift-exchange relationship across the cells, though a closer examination suggests that at intermediate levels of firm generosity (corresponding roughly to wages between 60 and 80 without donations to charity), effort may be lower in the Choice cells than in the noChoice cells. To examine the potential treatment effects more rigorously, we estimate panel linear regressions with effort choice as the dependent variable. The main explanatory variable is the measure of firm generosity: worker utility index in one model and foregone firm profit index in another. We use a quadratic in each of these variables, to allow for non-linear effects. Additional explanatory variables are dummies for the Choice and CSR treatments, the round number, all two- and multi-way products of these variables, a constant term, and subject random effects.

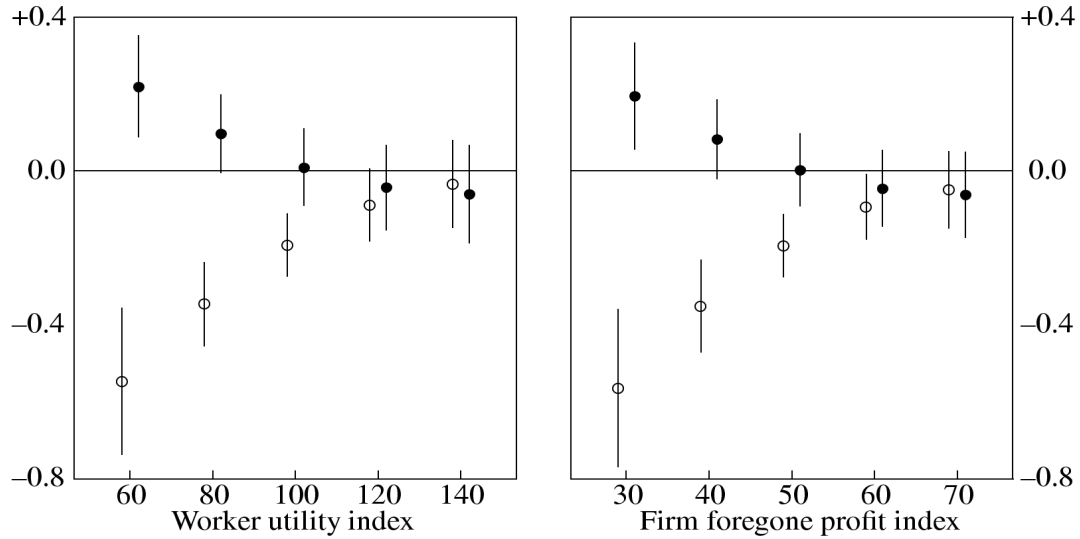
We omit the usual table of average marginal effects, since these are of little importance here. Instead, we focus on the marginal effects of our Choice- and CSR-treatment dummies at particular values of our firm-generosity indices. These are shown in Figure 6. At intermediate levels of firm generosity, we see a positive marginal effect for the CSR dummy and a negative marginal effect for the Choice dummy. These effects shrink as firm generosity increases, and at high levels (corresponding roughly to a wage of 80 to 90 with zero charity share), both effects become small and statistically insignificant. This result is in line with Imas (2014) who finds that workers might respond strongly to pro-social incentives when stakes are low, and maximise more their own earnings as monetary incentives increase.

The results for the Choice dummy warrant some additional discussion. As noted in Section 2, workers in the Choice treatment have two ways to reward a generous firm – through

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<sup>15</sup>See the Appendix for additional details.

Figure 6: Marginal effects of Choice and CSR on worker effort, for selected levels of firm generosity



**Notes:** The figure shows the marginal effects of Choice and CSR treatment dummies (light and dark circles, respectively) on worker effort, and 95-percent confidence intervals (vertical lines), for selected values of firm-generosity indices. These models are estimated on the sample of all worker choices, and standard errors are clustered by subsession. The lowest levels of firm generosity are not displayed because those levels are almost never observed in our Choice treatment.

high effort and through choosing the firm over its rival – while in the other treatments, they have only the former of these options. The negative marginal effect of the Choice dummy is consistent with this logic, but it is important to point out that the effect is only substantial over a range where there are relatively few observations in the Choice treatment. In all rounds, 75 percent of observations involve a worker utility index of 104 or higher, or a firm foregone profit index of 55 or higher. In the last three rounds, 75 percent of observations involve a worker utility index of 126 or higher, or a firm foregone profit index of 64 or higher. So the negative effect seen in the figure, while interesting, concerns levels of firm generosity not commonly seen in the Choice treatment. For levels that are likely to occur, workers' efforts are not substantially different from what they would have been in the noChoice

treatment.<sup>16</sup>

**Result 4:** We find evidence of gift exchange, with workers providing higher effort as the firm’s offer (wages and CSR) becomes more generous. Efforts are higher in the presence of CSR and lower in the presence of competition (i.e., Choice). All of these relationships become weaker for the most generous firm offers.

## 5 Conclusions

Previous studies indicate that in some contexts “corporate social responsibility” (CSR) could be a substitute for higher wages in the competition for talent (Cassar and Meier, 2018; Burbano, 2016; Koppel and Regner, 2014). In this study, we argue that this effect might change after accounting for self-selection: workers will respond to financial and social incentives in ways that relate to the reasons that led them to choose a particular job in the first place. For example, an investment banker and a charity worker might have different preferences for wages and CSR, and will choose an employer depending on the mix of incentives they offer. Then, the response of worker motivation to a firm’s selection of wages and CSR will be based on the behaviour of those workers who had chosen to work there, not the entire population of workers.

We have developed a novel version of the gift-exchange game to disentangle the effects of these two incentives – financial (wages) and social (CSR) – on workers’ behaviour. We also have examined the implications of CSR, in the form of donations to charity out of employers’ profits, for all stakeholders in the labour market: workers, firms, and the charity that receives corporate donations. To improve the external validity of our results, we include a treatment with a sorting mechanism, to account for a worker’s preference for choosing a firm that offers higher wages or higher charitable donations before exerting effort.

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<sup>16</sup>The relationships in Figure 6 between the marginal effects and the indices of firm generosity suggest that the slope of the gift-exchange relationship also varies across treatments. Indeed, this is the case. For all but the highest level of the generosity indices in the figure, the marginal effect of the generosity index itself is significantly higher in the Choice treatment compared to noChoice, and significantly lower in the CSR treatment compared to noCSR (for the highest level, the direction is the same, but not significant.) So, the gift-exchange relationship is steeper when workers can choose which firm they match with, and flatter when firms can donate to charity.

While in some settings, workers have been found to be willing to forgo financial compensation for a higher level of (non-pecuniary) job satisfaction (Cassar and Meier, 2018; Jones et al., 2018), in our experiment we do not see a significant number of workers choosing firms with higher charity donations over higher wages. While workers do value CSR, wages remain substantially more effective at attracting and motivating workers. In other words, even though an investment banker and a charity worker may have different preferences for wages and CSR, even the charity worker will respond primarily to the wage offer.<sup>17</sup> We further observe that allowing CSR has no significant effect on firms' profits, as firms compensate themselves for increasing donations to charity by reducing workers' wages. This implies a salary sacrifice for workers, with CSR resulting in a substantial reduction in their earnings. Thus, by improving realism of the gift-exchange game with a sorting mechanism, and studying the effects of financial and social incentives within the same environment, we provide a more comprehensive picture of the trade-offs involved in CSR.

Future observational studies could look at whether the adoption of CSR by large firms in the field suppresses wages, and whether it creates lasting effects on workers' reservation wages and expectations of firm's social responsibility (Falk et al., 2006). Similarly, field experiments might help disentangle whether workers choose firms that engage in CSR initiatives mainly because they value contributions to charity per se, or if such initiatives signal a better working environment (which would be impossible to detect in a lab setting such as ours). Additionally, future research should shed a light on the extent to which firms' CSR initiatives do in fact achieve the intended social objectives, or if they are mostly a marketing tool. Lastly, our study investigated the impact of CSR on all market stakeholders, but more work is needed to understand the effects on charities specifically: whether partnering with a firm provides net benefits – as opposed to simply crowding out other types of donations – and if partnering has implications for the charity operations.

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<sup>17</sup>Alternatively, it could be that our subject pool is predominantly made up of future investment bankers. However, only 36 percent of our subject pool majored in either economics or business.

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# Appendix

## A Additional theoretical results

### A.1 Equilibrium under standard preferences

Under standard (own-payoff-maximising) preferences, equilibrium behaviour in all three treatments involves the worker choosing either of the zero-cost efforts ( $e = 0$  or  $e = 0.1$ ), and in the Choice treatment, selecting the higher-wage firm. (The charity shares offered by the firms do not affect the utility of such a worker, so cannot affect the worker's choice of firm unless both offer the same wage; in that case, any choice by the worker is sequentially rational.) Thus in the noCSR treatment, equilibrium effort-choice behaviour can be characterised by  $W^* = \{w : e(w) = 0.1\}$  the set of wages that results in an effort choice of 0.1 rather than 0, allowing the firm to earn a positive payoff rather than a zero payoff. There is no restriction on which wages are in  $W^*$ , since workers are always indifferent between effort choices of 0 and 0.1, but since the latter is always weakly better for the firm, intuition and the previous literature on gift exchange suggest  $W^*$  may have the “threshold” form  $\{\bar{w}, \bar{w} + 1, \dots, 120\}$  for some integer  $\bar{w}$ . We can also include the case where  $W^*$  is empty by allowing  $\bar{w}$  to be 121.

In the CSR treatment, equilibrium effort-choice behaviour can similarly be characterised by  $X^* = \{(w, \chi) : e(w, \chi) = 0.1\}$ : the set of wage-charity-share pairs that result in an effort choice of 0.1. As in the noCSR treatment, there is no restriction on this set, though it is probably reasonable to assume a threshold form, such that if  $\{(w, \chi) \in X^*\}$ , then  $\{(\hat{w}, \hat{\chi}) \in X^*\}$  for  $\hat{w} > w$  and  $\hat{\chi} > \chi$ .

Equilibrium firm behaviour will thus depend on the worker's strategy. In the noCSR treatment, if  $W^*$  has the threshold form described above, firms will be indifferent over all wage choices if  $\bar{w} \geq 120$ , as they cannot earn a positive profit. If  $\bar{w} \leq 120$ , firms will choose  $\bar{w}$  in the Pair and Assign treatments, while in the Choice treatment, competition for the worker will entail that both firms choose either 119 or 120.

Similarly, assuming a threshold form for  $X^*$  in the CSR treatment, if  $X^*$  contains no wage-charity-share pairs that allow a positive profit (either  $\bar{w} \geq 120$  or  $\bar{\chi} \geq 120$  for all

members of  $X^*$ ), then firms will be indifferent over all pairs. If  $X^*$  does allow a positive profit, then in the Pair and Assign treatments, firms will choose the profit-maximising pair in  $X^*$  (i.e.,  $(w, \chi)$  that maximises  $(120 - w) \cdot (100 - \chi)$ ). In the Choice treatment, if we make an additional assumption that workers' choice of firm is monotonic in charity share (i.e., if both firms offer the same wage but one offers a higher charity share, that one will be chosen), then in equilibrium firms will choose one of (i)  $w = 120$ , with  $\chi$  indeterminate; (ii)  $\chi=100$ , with  $w$  indeterminate; or (iii)  $w=119$  and  $\chi=99$ .

There are therefore a large number of equilibria in this setting, but some of the important properties of the set of equilibria are as follows. First, the worker's effort choice  $e$  is never larger than 0.1 in any equilibrium. Second, predicted treatment effects depend on what assumptions are made about equilibrium selection. If we assume that  $W^*$  and  $X^*$  are fixed across Pair, Assign and Choice cells within the noCSR and CSR treatments respectively, then equilibrium wages (and in the CSR treatment, charity shares) weakly increase as we move to the Choice cell from one of the other cells. However, the increase need not be strict (e.g., if  $\bar{w}=119$  in the noCSR treatment, then  $w$  will be 119 in all three cells of that treatment).

## A.2 Optimal worker's effort under other-regarding preferences

In this section, we demonstrate that optimal effort by workers is typically non-monotonic when they are other-regarding. For simplicity, we focus on the noCSR treatment, but similar results obtain for the CSR treatment. We suppose that workers have utility functions as described by Fehr and Schmidt (1997). The general form is:

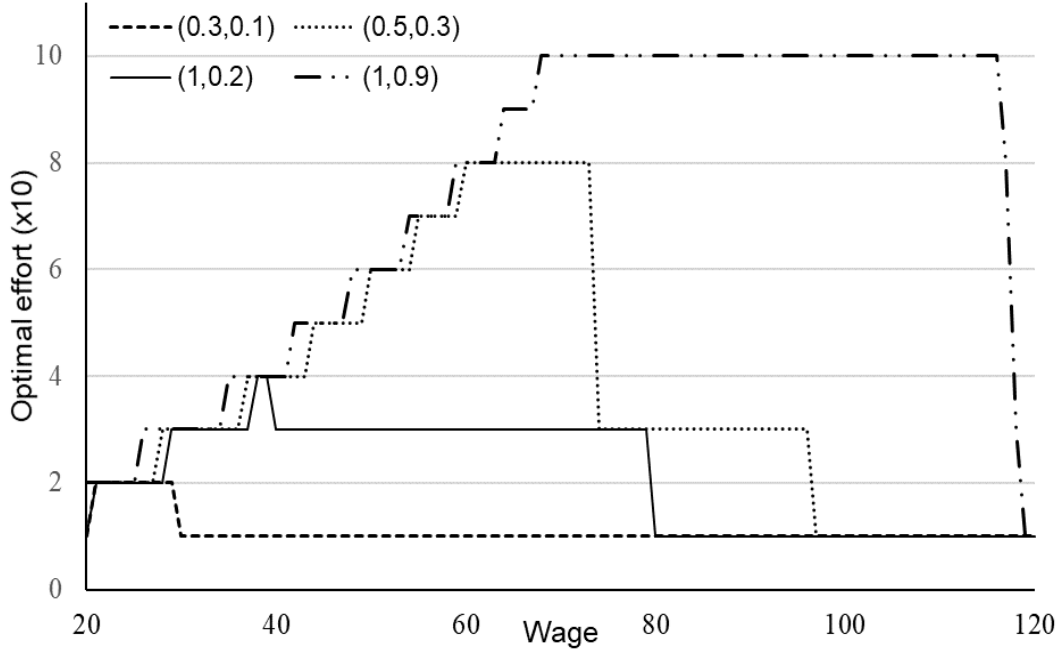
$$v_i(\pi_w, \pi_f) = \pi_w - \alpha \cdot \max\{\pi_f - \pi_w, 0\} - \beta \cdot \max\{\pi_w - \pi_f, 0\} \quad (9)$$

where  $\pi_f$  and  $\pi_w$  are the monetary payoffs to the firm and worker respectively,  $\alpha$  is the worker's aversion to disadvantageous payoff inequity (i.e., the firm earning more than the worker), and  $\beta$  is his aversion to advantageous payoff inequity. Using (1), (2) and (9), we have the worker's optimisation problem:

$$\begin{aligned}
& \max_{\pi_w, \pi_f} [\pi_w - \alpha \cdot \max\{\pi_f - \pi_w, 0\} - \beta \cdot \max\{\pi_w - \pi_f, 0\}] \\
& \text{subject to: } \pi_w = w - c \left( \frac{\pi_f}{120 - w} \right)
\end{aligned} \tag{10}$$

For a given combination of  $\alpha$  and  $\beta$ , the optimal effort  $e$  depends on the wage  $w$ ; thus, the set of combinations of  $w$  and optimised  $e$  can be shown as a graph. Figure 7 shows such a graph, for four particular combinations of  $\alpha$  and  $\beta$ .

Figure 7: Utility-maximising effort levels for selected  $(\alpha, \beta)$



**Notes:** The figure shows utility-maximising effort levels under Fehr-Schmidt preferences for selected values of  $\alpha$  (aversion to disadvantageous payoff inequity) and  $\beta$  (aversion to advantageous payoff inequity).

The selected  $(\alpha, \beta)$  pairs were chosen to span the range of possible graphs, but those from other  $(\alpha, \beta)$  pairs yield similar results. As the figure shows, quantitatively there are large differences in the gift-exchange relationship depending on how inequity-averse the worker is. However, qualitatively the graphs are very similar. In each case, effort initially increases with the wage, but reaches a maximum and then decreases, eventually all the way to 0.1.

### A.3 Trade-off between wage offer and charity share

To estimate the trade-off faced by firms between wage offers and charity shares, recall that the firm's profit function, if matched (equation 2 in the manuscript), means that the cost of a unit of wage depends on the charity share, and the cost of a unit of charity share depends on the wage. Both also depend on the worker's subsequent effort choice. From the profit function, we have:

$$\frac{\partial \pi_f}{\partial w} = -(100 - \chi) \cdot e/100 \quad (11)$$

and

$$\frac{\partial \pi_f}{\partial \chi} = -(120 - w) \cdot e/100 \quad (12)$$

The fact that wage offer ranges from 20 to 120 and charity share ranges from 0 to 100 provided the rationale for re-scaling charity share by adding 20. From Table 4 in the manuscript, average wage in Choice-CSR is 65.5, average charity share is 13.5, and average effort is 0.356. Using these averages, we get  $\frac{\partial \pi_f}{\partial w} = -0.307$  and  $\frac{\partial \pi_f}{\partial \chi} = -0.194$ . In other words, given typical choices for the wage and charity share, an experimental currency unit (ECU) buys fewer additional units of wage offer than it buys additional units of charity share offer ( $1/0.307 \approx 3.26$  and  $1/0.194 \approx 5.15$ , respectively).

The partial derivatives can be used to rescale  $w$  and  $\chi$  as ECU spent on wage and ECU spent on charity shares. Define:

$$\hat{w} = \frac{100}{(100 - \bar{\chi}) \cdot \bar{e}} \cdot w \quad (13)$$

and

$$\hat{\chi} = \frac{100}{(120 - \bar{w}) \cdot \bar{e}} \cdot \chi \quad (14)$$

where  $\bar{w}$ ,  $\bar{\chi}$ , and  $\bar{e}$  are the respective sample means in the Choice-CSR cell.<sup>18</sup> Then we can estimate the model on the firm data in the Choice-CSR cell (where  $g$  is the probit function):

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<sup>18</sup>Ideally, we would perform the multiplications and divisions at the level of the individual observation, before taking the expectations, but this is not possible, since  $e$  is only defined for the half of observations where the firm is chosen.

$$Prob(Choose\ Firm\ 1) = g \cdot [\alpha + \beta_w \widehat{w} + \beta_\chi \widehat{\chi}] \quad (15)$$

Note that this is different from the estimates reported in Table 7. First, it uses firm (rather than worker) data, so the variables are (scaled) wage and charity share of a single firm, rather than ratios of two firms' offers. Second, since ratios are not used, there is a constant term. The main results are qualitatively similar, to each other and to the results in Table 7): the wage is significantly more "important" than the charity share in determining which firm is chosen by the worker. For example, the bottom half of the table indicates that the marginal ECU is about 9 times as effective when spent on wages compared to charity donations.

Table 8: Firm choice with panel probits

	Wage (units)	Charity share	wage vs charity share
Firm chosen (N = 360)	0.0110*** (0.0013)	0.0019 (0.0018)	$p < 0.001$
	ECU spent on wage	ECU spent on charity share	wage vs charity share
Firm chosen (N = 360)	0.0034*** (0.0004)	0.0004 (0.0003)	$p < 0.001$

**Notes:** Probit MEs and standard errors. \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$