Reciprocity at the Workplace: Do Fair Wages Lead to Higher Effort, Productivity, and Profitability?

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Preliminary – Please do not quote.
Comments welcome

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Abstract

Do workers reward fair wages with higher job effort, better labour relations, and greater workplace labour productivity and profitability (positive reciprocity) and punish unfair wages with lower effort, worse relations, and lesser productivity and profitability (negative reciprocity)? The importance of fairness and reciprocity in labour markets rests largely on experimental results examining the behaviour of subjects in laboratory settings. In contrast, I examine whether workers, who report whether they feel that their pay is fair or unfair, reciprocate in their normal, everyday jobs using a large, economy-wide, Australian linked survey of workers and workplaces. Without controls for pay schemes, no statistically significant evidence of positive reciprocity is found although I find some evidence of negative reciprocity in labour relations and workplace labour productivity. I introduce controls for pay scheme to isolate a particular payment arrangement which would best foster reciprocity. Under that particular scheme, however, no greater evidence of reciprocity is found relative to other pay schemes. Overall, the evidence consistent with either positive or negative worker reciprocity is not strong.

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I. Introduction

A large body of experimental evidence finds that the standard *homo economicus* behavioural assumption of self-interested individuals sometimes predicts poorly how subjects behave by ignoring the notions of fairness and reciprocity. In particular, people care about how fairly or generously they are treated and are willing to reciprocate or respond in a similar manner even if it is costly to them and yields no present nor future monetary reward. Rewarding kind treatment (*positive reciprocity*) or punishing unkind treatment (*negative reciprocity*) describes well the choices often made by experimental subjects.

The importance of fairness and reciprocity in labour markets rests largely on experiments examining the behaviour of subjects in laboratory settings.[1] Workers in these settings are paid to perform very straightforward, well-defined tasks (e.g., cracking walnuts) or, more commonly, are simply choosing a number symbolizing effort which will affect some imagined output and the payoffs to the "firm" and the "worker". How worker productivity or the effort number varies with the wage level, type of wage contract offered, or who determines the wage is of primary interest. As Falk and Fehr [2003, p. 403] have pointed out,

> While the superior control possibilities of experiments are beyond doubt, the question whether the conditions implemented in the laboratory are also present in reality will probably always be subject to some uncertainty and debate. This is one reason why lab experiments should not be viewed as substitutes but as complements to more traditional methods of empirical economic analysis.

The contribution of this paper is to apply such a traditional approach by using a large, economy-wide, Australian linked survey of workers and workplaces to examine whether employees, who state that they are paid fairly or not, reciprocate at the workplace. To the best of my knowledge, this study is unique in examining reciprocity by workers in their normal, everyday jobs.

The questions I address are: Do employees who feel that they are paid fairly put greater effort on the job? Do workplaces, which have a greater proportion of workers who receive a fair wage, have better labour relations, higher labour productivity, and greater profitability? An affirmative answer provides evidence of positive reciprocity. On the flip side, for workers who do not feel that they are paid fairly, do they place less effort on the job? For workplaces which have a greater proportion of such workers, are there worse labour relations, lower productivity, and lesser profitability revealing the impact of negative reciprocity? The reference worker or

[1] Other evidence based on one-on-one interviews or interview surveys of employers, personnel managers, labour leaders, business consultants, and others suggest that fairness and reciprocity are important in explaining the reluctance of firms to cut nominal wages during recessions and high unemployment. See, e.g., Bewley [1999] and Agell and Lundborg [1995].

worker group are those who have neutral or indifferent feelings about their pay, i.e., they neither feel that they are paid fairly nor unfairly.

I examine the above questions first without and then controlling for the type of pay scheme a worker is paid under. These controls are introduced to capture the influence of intentions and explicit incentives on worker reciprocity. Pay schemes where the wage offer can be causally attributed to the employer and not a third party and which do not incorporate explicit incentives should provide the best opportunities to foster and reveal reciprocity as suggested by laboratory experiments.

I establish first that workers who feel that they are paid fairly tend also to receive a high wage as measured by positive wage residuals from conventional wage regressions. In addition, fair wage workers are more likely to feel satisfied with their job and feel positive about their workplace and management.

To detect reciprocity, I examine whether self-reported worker effort and manager's responses regarding workplace labour relations, labour productivity, and profitability vary systematically with workers' fairness evaluation of their pay. Without controls for pay scheme, no statistically significant evidence of positive reciprocity is found. In fact, paying fair wages has an unexpected negative although insignificant impact on labour relations, productivity, and profitability. Some evidence consistent with negative reciprocity appears. Paying unfair wages has a highly significant negative impact on labour relations as well as a negative, albeit weakly significant, effect on workplace productivity.

With controls for pay scheme, few statistically significant effects of fair or unfair wages emerge. The pay scheme which would best reveal reciprocity given causal attribution of wages to employer intentions and the absence of explicit incentives does not provide any greater evidence of reciprocity than other pay schemes. Overall, the evidence consistent with either positive or negative worker reciprocity is not strong.

The paper is structured as follows: The next section briefly discusses some relevant reciprocity experiments. Section III provides details about the Australian linked workplace-worker survey and the main wage fairness variables. I also present the ordered logit framework and discuss some estimation considerations. In order to assess whether worker opinions on the fairness of their pay are meaningful, I examine in Section IV whether fair wages are positively associated with high wages and favourable attitudes by workers toward their job, workplace, and management. In Section V , different pay scheme variables are defined followed by the main investigation whether wage fairness leads to observable reciprocity effects. The final section provides a summary and concluding remarks.

II. A Brief Discussion of Some Reciprocity Experiments

Results from ultimatum bargaining game experiments aptly demonstrate negative reciprocity.[2] In this game, two subjects (a proposer and a responder) must agree on how to divide a fixed sum of money. The proposer makes an offer on how to share that sum which the responder must either accept or reject. If the offer is accepted, the proposed division is implemented. If rejected, both subjects receive nothing. Assuming selfish preferences, the subgame perfect strategy has the proposer offer the smallest positive amount to the responder who will then accept. A robust finding in hundreds of experimental trials is that offers of less than 20 percent of the amount to be shared are turned down with probability 0.4 to 0.6 . While self-interest would suggest accepting the offer ("something is better than nothing"), responders view offers which are too "low" as unfair and reject them. The proposer receives no share and is punished.

Positive reciprocity has been shown in gift-exchange experiments. A proposer or employer offers a wage payment. The responder or worker may either accept or reject the wage offer. If rejected, both subjects earn nothing. If accepted, the responder must choose a number that is an abstract representation of the level of worker effort. The responder/worker subject never expends physical nor mental effort. "Effort" here only has import due to its monetary consequences. Greater effort is profitable to the employer but increasingly costly to the worker. Workers have no monetary incentive to select more than the minimum level of effort. The above gift-exchange game presents a stylized principal-agent situation with incomplete contracts. The wage offer or contract is incomplete since the proposer or principal cannot specify and enforce a particular effort level of the responder or agent.

While the subgame perfect strategy would be the lowest possible wage offered and the lowest possible effort elicited, the main experimental findings are much higher wage offers and effort levels than predicted as well as a positive wage-effort relationship. A sizeable proportion of responders (often 40 percent or more) reward generous or fair wage offers with generous effort. This positive reciprocity leads to "cooperative" outcomes which are less Pareto-inefficient relative to standard game theory predictions with self-interested agents. Given the contractual incompleteness with regard to effort, employers may use fair wages as a strategy based on worker reciprocity to motivate workers and limit shirking.

[2] Falk and Fischbacher [2002], Fehr and Gächter [2000], and Fehr and Schmidt [2001] all provide an overview of the experimental results documenting the importance of fairness and reciprocity as well as coverage of different

The degree of reciprocity may depend on the type of reciprocity. Negative and positive reciprocity need not be symmetric. In experiments which consider both types, there ". . . seems to be an emerging consensus that the propensity to punish harmful behavior is stronger than the propensity to reward friendly behavior" (Fehr and Gächter [2000], p. 162).

Laboratory studies also suggest that worker reciprocity is influenced by intentions and explicit incentives. The importance of intentions is linked to "intentions-based reciprocity," one of the main theoretical approaches to modelling fairness and reciprocity. This approach is linked to psychological game theory and assumes that agents care about the intentions that lead their opponents to choose their actions as well as the distributional consequences of the actions (see Fehr and Schmidt [2001]). Modifying the above gift-exchange game so that workers are not allowed to reject the wage offer, Charness [2004] examines the effort choices of the worker when the offer is made by the employer or by an external process (a draw from a bingo cage or a choice by a neutral third party). Causal attribution takes into account whether the choice is made by a party who is materially affected by the choice and suggests that reciprocity would be greater in the case of employer's volition. His experiments show significant negative reciprocity as low wage offers are significantly more likely to lead to minimal effort in the employer-generated relative to the exogenous wage case. On the other hand, no clear conclusion can be drawn for positive reciprocity when examining the difference in effort response to high wage offers across the two treatment cases. He concludes that the attribution of volition is important in effort choice consistent with intentions-based reciprocity.[3]

Explicit incentives tend to reduce worker reciprocity or cooperation. In a series of experiments, Fehr and Gächter [2002] examine worker effort choices and resulting employer profits and wage payments under three treatments: employer offers a contract consisting of a fixed wage and a *desired* effort level and two treatments where the contract is supplemented with either a bonus or fine.[4] If the worker is caught shirking (actual effort is less than desired), the worker is either fined or the bonus is not paid. The fine and bonus act as explicit performance pay since they depend on the worker's choice of effort. They bind when the worker shirks subject to an exogenous probability that the shirking is verified. Their results indicate that average effort levels are lower under explicit performance incentives relative to

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theoretical approaches. References for the experimental results mentioned in this Section can be found in these three papers.

[3] Although not in a labour market context, other experimental evidence supporting the impact of intentions on reciprocity can be found in Blount [1995], Falk, Fehr, and Fischbacher [2000], and Offerman [2002].

[4] Fehr and Gächter [2002] present the experiments as a buyer and seller contracting over a good or service where the seller can determine the quality. Elsewhere (Fehr and Gächter [2000]), however, they re-label the buyer, seller, and quality as employer, worker, and effort which I follow here.

fixed wages. The fixed wage "trust" treatment relies only on reciprocity-based effort elicitation which is reduced or "crowded out" when explicit incentives are introduced.[5]

III. Data and Some Econometric Considerations

A. The 1995 Australian Workplace Industrial Relations Survey

The data used in this paper are drawn from the 1995 Australian Workplace Industrial Relations Survey (AWIRS 95). This survey was conducted by the Australian Commonwealth Department of Industrial Relations in 1995. I use two components of AWIRS 95 and establish a matched workplace-employee data set. The first component is the main survey of 2001 Australian workplaces with at least 20 employees spanning all industry sectors except agriculture, forestry and fishing, and defence. It is composed of four different questionnaires completed by different individuals affiliated with the workplace; in particular, an employee responsible for employee records, the most senior manager, the manager responsible for employee relations, and the most senior delegate from the largest union at the workplace, if a union and delegate were present. The second component is the employee survey which randomly surveyed a sample of employees at each of 1896 (or 95%) of the 2001 workplaces in the main survey. A total of 30,005 questionnaires were distributed resulting in 19,155 employee observations or a response rate of 64%. Linking these components provides detailed information about both the workers and their workplaces.[6]

B. Wage Fairness Variables

The key variables of interest capture worker responses to this statement:

I get paid fairly for the things I do in my job.

Of the 18,287 useable responses, the distribution of possible answers were: "Agree" 47.5%, "Neither agree nor disagree" 20.5%, and "Disagree" 32.0%. Although almost half felt they received a fair wage, the fraction of employees who had a neutral opinion about the statement and of employees who disagree are sizable.[7]

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[5] Their results indicating that performance incentives may undermine reciprocity or lower voluntary cooperation are consistent with other work by economists (see, e.g., Gneezy and Rustichini [2000]) and the work by psychologists on the crowding out of intrinsic motivation by explicit rewards (see Deci and Ryan [1985]).

[6] Morehead et al. [1997] provides further detailed information about AWIRS 95.

[7] Note for this variable and for other attitudinal queries in the AWIRS 95 survey, respondents could respond with "Don't know" but that response has been recoded as "Missing" in the data set available to this researcher. Generally, the "Don't know" response constitutes a small percentage of all responses. For example with regard to the paid fairly statement, the AWIRS 95 codebook reports that 447 (2.3%) of all 19,155 employee responses were truly "Missing" while 421 (2.1%) were actually "Don't know." The other possible responses of "Agree," "Neither agree nor disagree," or "Disagree" register a definite although possibly neutral opinion about the statement while "Don't know" suggests that the respondent is unsure about their opinion.

Wage fairness is measured by the response of the worker and not of the employer or by some objective standard. The inherent subjectivity is unavoidable and desirable since the worker's beliefs are crucial in his/her desire to reciprocate.[8] Community surveys of fairness (see, e.g., Kahneman, et al. [1986]) find that while a large majority of the respondents might agree on the fairness or unfairness of pricing decisions in hypothetical product or labour market transactions, a substantial minority almost always will disagree. Like beauty, what constitutes a fair wage is in the eye of the beholder. How workers interpret being paid fairly and what interpersonal wage comparisons they might make is not certain (i.e., "fair" relative to what or whom?) nor is of primary importance to this paper.

Using the survey responses to the above statement, I construct two dummy variables (*Fair wage* and *Unfair wage*) to indicate whether the worker agreed or disagreed with the above statement. To capture wage fairness at the workplace, I need to aggregate across responses by individual workers. My approach is to construct two variables - one which reflects the proportion of workplace workers surveyed who responded that they agreed they were paid fairly (*% fair*) and the other the proportion that disagreed (*% unfair*).

C. Ordered Logit Framework

Almost all of the all of the left-hand side variables of interest are subjective, ordered multinomial responses. For example, the senior manager at the workplace is asked:

In your opinion, how does the level of labour productivity here compare with your major competitors?

with possible responses "A lot lower," "A little lower," "About the same," "A little higher," and "A lot higher." I recode the manager's response y to take on the value of -2, -1, 0, +1, or +2, respectively. The values themselves are not important, only the ordering. The workhorse regression model will be an ordered logit framework for y. In particular, I assume a latent variable y^* determined by $y^* = \boldsymbol{x\beta} + \varepsilon$ where $\varepsilon|\boldsymbol{x}$ has a logistic distribution and $\boldsymbol{x}$ does not contain a constant. For the above productivity response case, define $\alpha_1 < \alpha_2 < \alpha_3 < \alpha_4$ as unknown cut points or threshold parameters and

$$\begin{aligned} y &= -2 \quad \text{if} \quad y^* \le \alpha_1 \\ y &= -1 \quad \text{if} \quad \alpha_1 < y^* \le \alpha_2 \\ y &= \ 0 \quad \text{if} \quad \alpha_2 < y^* \le \alpha_3 \\ y &= +1 \quad \text{if} \quad \alpha_3 < y^* \le \alpha_4 \end{aligned}$$

[8] The importance of beliefs and not simply of events on behaviour is the premise of rational-emotive behaviour therapy founded by Albert Ellis and is related to the Stoic philosopher Epictetus' dictum "What disturbs people's minds is not events but their judgements on events."

$$y = +2 \qquad \text{if} \qquad y^* > \alpha_4$$

Estimation of $\boldsymbol{\beta}$ and the threshold parameters is by maximum likelihood. A positive (negative) value of β_i suggests that with higher values of the associated variable x_i, the distribution of y^* will be shifted to the right (left) and raise (lower) the probability y is in the highest response category (+2) and lower (raise) the probability in the lowest response category (-2). The probability impact on the intermediate categories cannot be signed.

The right-hand side variables consist of those used in a fairly conventional wage regression. I make use of the matched worker-workplace aspect of the AWIRS 95 survey. A large number of human capital variables, demographic characteristics, and job characteristics provide information about the worker while unionization membership and activity, workplace size, firm size, ownership, product market considerations, workforce composition, and 2-digit level industry dummy variables provide details about the workplace.[9] Table 1 provides summary statistics for all variables used in this study. For consistency and simplicity, the same controls are relied on in the non-wage regressions. Regressions at the worker-level incorporate information about both the worker and workplace while those at the workplace-level incorporate information about the workplace.

Because most of the right-hand side controls are indicator variables, the ordered logit regressions may, in a few cases, fail to converge due to the problem of perfect prediction or perfect separation. In particular, I examine in Sec. IV job effort by females where about 94% of female workers respond that they put "a lot of effort" into their job which is the highest response category. For any given indicator right-hand side variable, there may not be any variability in reported job effort for workers in the sample, e.g., among females whose highest completed education level is primary school, all report that they put a lot of effort into their job. Knowing if a female is in that education category perfectly predicts the dependent variable. As a result, maximum likelihood estimation chooses a coefficient for the primary education dummy variable closer and closer to infinity so that the latent variable y^* is almost certainly above the highest cut point. In these perfect prediction situations, I drop both the offending indicator variable and associated observations (e.g., females with only a primary education). These situations, however, do not arise when relying on the full AWIRS 95 sample of workers or workplaces but only when using the smaller sub-samples of male workers or of female workers.

[9] These controls can be found in other wage studies which use the AWIRS 95 data, see, e.g., Wooden [2001].

IV. Fair Wages, High Wages, and Worker Attitudes

As discussed in Section III, my variables for fair wage are based on workers' subjective responses. The economics literature refers to norms and suggests that the fairness of how one is treated is by comparison to the treatment of reference individuals or of reference groups (see, e.g., Akerlof [1982] and Fehr and Schmidt [2001]). I do not explore what are those norms or reference individuals/groups but instead assess whether workers' survey responses are meaningful by assessing their correlation with wages and attitudes toward work and management. In particular, I would expect that workers who report that they are paid fairly receive a high wage and look upon their job, workplace, and management favourably. If managers seek

A. Are Fair Wages High Wages?

In the gift exchange version of efficiency wages, employers may find it profitable to offer workers a "gift" or wage in excess what they would receive if they left their current jobs.[10] I capture the notion of "high wage," i.e., a wage greater than a worker's best alternative or the market-clearing wage, by examining the residuals from a conventional wage regression. I conjecture that a worker who is paid more than what would be expected given the individual's measurable productivity and workplace characteristics is more likely to agree with the AWIRS 95 survey statement that "I get paid fairly for the things I do in my job."

The wage regression takes the form of

$$ln\, W_{ik} = \alpha + \beta X_{ik} + \gamma Z_k + e_{ik}\,, \qquad i = 1, \ldots, N_k \quad k = 1, \ldots, K \qquad (1)$$

where $ln\, W_{ik}$ is the natural log of the wage rate for worker i in workplace k, X_{ik} is a set of employee characteristics, Z_k a set of workplace characteristics, N_k the number of worker observations in workplace k , and K the number of workplaces. The choice and construction of variables (both dependent and independent) mimics what was used by Wooden [2001] who analyzes union wage effects in Australian labour markets using the same AWIRS 95 survey data as this study. The wage rate variable is constructed by dividing the usual or average gross weekly earnings by the usual hours worked on the job. The weekly earnings data is coded in 23 pay categories. As is conventional, actual earnings are approximated by choosing the mid-point of each pay category.[11]

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[10] In Akerlof's [1982, p. 543] seminal paper linking gift exchange to labour markets, he writes, "Workers' effort depends upon the norms determining a fair day's work. In order to affect those norms, firms may pay more than the market-clearing wage."

[11] Following Wooden [2001], the estimate for the top open-ended pay category ($1,150 or more per week) was arbitrarily obtained by multiplying the lower bound of $1,150 by 1.5 . Wooden [2001, fn. 8] indicates that his results are not sensitive to the method used in assigning earnings in this open range.

A large number of explanatory variables are used most of which are dummy variables. The vector X_{ik} is composed of human capital, demographic, and job characteristics of the worker while Z_k is composed of workplace measures of union presence and activity, workplace ownership and size, firm size, product market characteristics, and gender and shiftwork composition of the workforce.[12]

Wage equation (1) is estimated separately by gender using fixed effects estimation for our workplace clustered sample.[13] I create a *Get paid fairly* ordinal variable taking the value of +1, 0, or -1 if an employee's response is "Agree," "Neither agree nor disagree," or "Disagree," respectively, to the statement *I get paid fairly for the things I do in my job.* Using an ordered logit model, I then regress separately by gender the *Get paid fairly* variable on the residuals $\hat{e}_{ik}$ from estimating wage equation (1) as well as on the workplace effect $\hat{c}_i$ and idiosyncratic error $\hat{u}_{ik}$ components of $\hat{e}_{ik}$ ($\equiv \hat{c}_i + \hat{u}_{ik}$). Table 2 reports the results. I find that the coefficients on the estimated wage residuals as well as on its components are positive and highly significant (*p*-value<.01) for both males and females. Clearly, employees who are paid more than what would be expected from a typical wage regression are more likely to respond that they are paid fairly.

[12] In particular, X_{ik} consists of seven age group dummies, seven education dummies, job tenure, job tenure squared, eight occupation dummies, two overseas region of birth dummies, three variables indicating the number of children in three different age categories and several dummy variables which indicate whether worker is disabled, is an Australian Aboriginal or Torres Strait Islander, is employed on a casual basis (received neither paid holiday nor sick leave), is employed on a fixed term contract, and is a union member. The workplace variables Z_k control for the proportion of workplace employees who belong to a union, an "active" union dummy, two size of foreign ownership dummies, workplace employment size and size squared, six firm size dummies, 15 industry dummies (2-digit ANZSIC classification scheme), six dummy categories for percentage of employees who worked shifts or were on call, proportion of employees who are female, and several dummy variables which capture product market considerations. These product market variables indicate whether there are "few" or "many" competitors for the workplace's major product and whether the workplace is non-commercial, is in the public sector, exports most of its major product, or faces import competition. For additional details about the controls X_{ik} and Z_k , please see Wooden [2001]. Unlike Wooden, I do not include workplace controls for labour costs as a proportion of total costs nor seven variables measuring the occupational composition of the workforce. The former was viewed as a means to measure labour intensity and the latter as "as a crude means of controlling for sorting behaviour by firms" (p. 10). The theoretical justification for either is weak, however. I also do not include controls for workplace location since that AWIRS 95 information is no longer available for public use. In one very minor difference with Wooden who combines the 1000-4999 employees and 5000-9999 employees categories into one, I retain all seven, rather than six, workplace employment size categories.

[13] For both male and female wage regressions, the Breusch-Pagan Lagrange multiplier test supports a random effects over a pooled OLS specification due to the presence of non-zero workplace effects. The Hausman χ^2 test favours fixed effects rather than random effects for males and the reverse for females. For similar wage estimation across gender although at the cost of lesser efficiency, I focus on the fixed effects approach for the female sample. Note that the wage impact of workplace invariant controls Z_k can not be separately identified from the workplace fixed effect.

In addition, employees at high wage workplaces (positive c_i) as well as those who receive high wage shocks at any workplace (positive u_{ik}) are more likely to perceive their wage as fair.[14]

B. Do Fair Wages Contribute to Job Satisfaction and Favourable Work Perceptions?

If employers seek to elicit positive reciprocity, one would expect that workers would not only receive a fair wage but also be exposed to a positive work environment. Several survey questions concerning employee attitudes about their job, their workplace, and management are relevant in testing this expectation. I list below in italics the four questions or statements and the distribution of useable employee responses in the AWIRS 95 sample along with the ordering of responses for later work.

Are you satisfied with the following aspects of your job?. . . "Your job overall"

"Satisfied" = +1	"Neither satisfied nor dissatisfied" = 0	"Dissatisfied" = -1	
63.4 %	24.5 %	12.1 %	N = 18,545

Do you agree or disagree with the following statements?... "This is a good place to work"

"Agree" = +1	"Neither agree nor disagree" = 0	"Disagree" = -1	
58.7 %	29.5 %	11.8 %	N = 18,442

Are you satisfied with the following aspects of your job?. . . " The way management treat you and others here"

"Satisfied" = +1	"Neither satisfied nor dissatisfied" = 0	"Dissatisfied" = -1	
44.7 %	26.6 %	28.7 %	N = 18,271

Do you agree or disagree with the following statements about this workplace? "Management at this workplace does its best to get on with employees"

"Agree" = +1	"Neither agree nor disagree" = 0	"Disagree" = -1	
56.7 %	26.6 %	16.7 %	N = 18,559

Generally, most workers tend to have a positive attitude toward their employment situation while no more than 30% a negative attitude.

I analyze whether these attitudes are correlated with workers' perception of the fairness of their wage. The results are reported in Table 3. The explanatory variables of interest are the

[14] These results are also obtained if the wage residuals are drawn from random effects as opposed to fixed effects estimation.

If the interpretation of the wage residuals as capturing unobserved worker ability differences, it is not obvious that one would expect a positive association between these ability differences and wage fairness responses.

dummy variables *Fair wage* and *Unfair wage* which indicate whether the worker agrees or disagrees, respectively, that he/she is paid fairly. The excluded response from the ordered logit regressions is where the worker neither agrees nor disagrees. Hence, the coefficients attached to the variables of interest indicate the impact on the latent variable y^* relative to the excluded category of a worker who has a neutral opinion of the fairness of their pay. The same sets of covariates X_{ik} and Z_k used in the earlier wage regressions are also used here which provide extensive controls for both the worker and workplace.

I find that those who are paid fairly are more likely to have a positive attitude toward their job, workplace, and how management deals with workers while those who feel that they are not paid fairly a negative attitude. "More likely" is relative to workers who state a neutral response to wage fairness, all else equal. The coefficients for *Fair wage* are all positive and highly significant (p-value<0.01) while the coefficients for *Unfair wage* are all negative and also highly significant. The former coefficients are uniformly larger in magnitude than the latter suggesting a bigger impact or stronger correlation of *Fair wage* relative to *Unfair wage* with favourable employment relations.

The results of Tables 2 and 3 suggest that employees' survey response evaluating the fairness of their pay are not spurious, idiosyncratic responses but instead are related in a systematic way to their wage and employment situation. Workers who report receiving a fair wage tend to receive a high wage relative to what would be expected from a conventional wage equation. They are also more likely to feel satisfied with their job and management relative to employees who feel ambivalent about the fairness of their wage. The mirror image is observed for workers who report that their wage is not fair. They tend to receive a low wage relative to expectations and are less likely to feel satisfied with their employment situation. This evidence is consistent with deviations from market wages influencing perceptions of wage fairness. Furthermore, favourable employment relations are in accord with fair wages. In contrast to a compensating wage differential perspective, fair or high wages here are not compensating for a bad working environment but are consistent with a human resource strategy of treating employee stakeholders positively in both monetary and non-monetary ways. The next section examines whether workers who receive fair wages reciprocate.

V. Fair Wages and Reciprocity

As discussed in the Introduction, paying fair wages may lead to positive reciprocity by the worker while unfair wages negative reciprocity. The AWIRS 95 survey provides several survey questions that can capture the beneficial or harmful worker response to their wage. In particular,

I examine whether self-reported worker effort and manager's evaluation of employee/ management relations, workplace labour productivity, and workplace profitability vary positively with fair wages and negatively with unfair wages.

Experimental studies have detailed the importance of intentions and the crowding-out impact of explicit incentives on worker reciprocity. In particular, employees are more likely to reciprocate when they can attribute their wage to employer volition relative to when wages have been set by a third party. The wage received by workers may be fair but workers feel no need to reciprocate back to their employer if their employer did not determine or choose their wage. Financial incentives for workers can backfire by reducing reciprocity-based voluntary cooperation. I account for these factors by isolating the extent of reciprocity under different payment arrangements.

A. Fair Wages, Reciprocity, and Payment Arrangements

To capture the impact of intentions and explicit incentives, I focus on three different payment arrangements. The first arrangement is *award* rates which were the traditional means of wage determination in Australia. Award rates are set by a federal or state arbitration tribunal. Prior to the late 1980s, "the vast majority of Australian employees were heavily dependent on [these] highly prescriptive multi-employer awards determined on their behalf by third parties which had little or no direct association with the workplace. The focus of these awards at the industry (or occupation) level served to promote a relatively high level of uniformity across employers." (Wooden [2000], p. 1).

The second arrangement is *overaward* pay which is pay greater than the award rate set by a government tribunal. I will focus on overaward pay situations where management unilaterally sets as opposed to negotiates the wage and where the labour payment is not based exclusively on a measure of performance (e.g., piece-rates). The first condition restricts overawards where the wage is determined exclusively by the employer. Hence, the worker can clearly attribute the choice of pay level to the employer and not to any other party such as the worker, a union bargaining representative, or a government agency. The second condition limits any confounding influence of performance incentives on reciprocity.

The third arrangement is *explicit incentives* where I wish to consider pay which is at least partly based on individual performance and where the link to performance is formalized and known by the worker in advance. Piece-rates and commissions are examples of such. The incentive pay schemes I rule out or attempt to rule out are broad based, performance pay schemes (e.g., profit sharing) and discretionary or informal schemes (e.g., "employee-of-the-

month" bonus payments). These are qualitatively different from the compensation incentives used in the experimental literature to establish the crowding-out of voluntary reciprocity by explicit performance incentives.

Given the experimental results on attribution and crowding-out, I would expect worker reciprocity to be greatest for overaward relative to award and explicit incentive pay. Comparing overawards to awards, the fairness or unfairness of the pay that a worker receives is more clearly attributed to the employer for the former and to a federal or state industrial relations commission for the latter. The dichotomy is in no way perfect since one can imagine that a worker may be disenchanted that the employer has decided to offer the award wage rate than to offer an overaward or to negotiate a collective or individual worker agreement. To the extent, however, that the assignment of award pay at the workplace may be due to custom or to prohibitive transactions costs in negotiating enterprise- or individual-specific wages, the worker may be less likely to assign credit or blame for the wage level to the employer. Comparing overawards to explicit incentives, the latter is directly tied to performance and how it is linked to performance is not necessarily determined unilaterally by the employer but could be negotiated. From both the perspective of material incentives crowding-out voluntary cooperation and of lesser employer attribution, reciprocity under explicit incentives should be smaller.

The AWIRS 95 main survey questionnaire of the employment relations manager asks numerous questions about the payment systems operating at the workplace. I use the responses to these questions as well as employee survey responses to best approximate the desired award, overaward, and explicit incentive pay schemes described above. These schemes are intended to take seriously or account for the attribution and crowding-out reciprocity results of experimental studies.

For data reasons but still trying to capture the same notion, I define or construct the pay scheme variables differently depending on the unit of observation (worker or workplace). I define an *award employee* as someone who: 1) did not receive bonuses nor incentives related to job performance over the last 12 months and 2) worked at workplace where most workers of the same occupation as the employee had their pay and employment conditions determined by an award rate. An *award workplace* is a workplace where 60% or more of the employees had their pay and employment conditions determined either by state awards or by federal awards.[15]

[15] The *award workplace* indicator variable is based on a AWIRS 95 "derived variable" which the survey team constructed from responses to various survey questions. As defined above, most award employees or most employees at award workplaces will have received an award wage rate but not necessarily all. Ideally, I would like to target only those who receive an award wage but unfortunately the AWIRS 95 survey does not allow me to pin down award employees or workplaces more precisely.

An *overaward employee* is defined to be someone who worked at an *overaward workplace*. An *overaward workplace* is a workplace where: 1) all employees at the workplace receive overaward pay, 2) overaward payments are not based only on a measure of performance, and 3) overawards are not negotiated but are set by management. An *explicit incentive employee* is defined to be a non-managerial worker at an *explicit incentive workplace*. An *explicit incentive workplace* is a workplace where: 1) all non-managerial employees received performance-related pay in the last year[16], 2) performance-related payments are based at least partly on individual performance[17], and 3) all non-managerial employees know the criteria used in assessing their performance-related pay. The above pay scheme variables (*award*, *overaward*, and *explicit incentives*) whether at the employee or workplace level are constructed as indicator variables. A fourth pay scheme (*other*) is created simply as the residual category for employees or for workplaces which do not fit into any of the other three schemes. The four payment system variables are designed to be mutually exclusive and exhaustive.[18] Table 4 provides details of the distribution of employees and workplaces in the survey sample across the different payment schemes.[19]

B. Template for Estimating Reciprocity Equations

Worker reciprocity will be examined using four different ordinal dependent variables – one of which is at the worker level (employee effort) and the other three at the workplace level

[16] The restriction to non-managerial employees is due only to the design of the AWIRS 95 survey questions on performance pay which asked about those payments only for non-managerial workers at the workplace.

[17] The survey question which inquired on the basis of the performance payments used at the workplace allowed the employee relations manager to respond with individual performance, workgroup performance, workplace performance, profit sharing, organisation performance as a whole, some other criterion, or any combination of these possibilities. Of the 722 workplaces who reported using performance payments, the vast majority (74.8%) indicated that they were based at least partly on individual performance. Of course, while individual performance pay may have been used at the workplace, not all employees at that workplace may have received individual performance pay.

[18] Due to wording of the AWIRS 95 survey questions and my classification criteria for the award, overaward, and explicit incentives payment schemes, employees and workplaces may be classified under more than one scheme. This happens, however, in 1% or less of the sample. In these cases, I reclassify the observations under the scheme that is most appropriate.

[19] Before discussing the empirical results of reciprocity and payment arrangements, the reader may be interested in whether the distribution of fair wage responses differ across payment method. I explore this by regressing the employee variable *Get paid fairly* of Sec. III.A. on indicator variables for the different payment arrangements using an ordinal logit model. This framework is estimated separately by gender although qualitatively the results are the same. I find that the coefficient estimates β(overaward) > β(award) and the difference is highly significant (p-value<.01). This result suggests that workers who receive an overaward relative to those who receive an award wage rate are more likely to feel that they are paid fairly which is not surprising since, as the name suggests, overawards pay more than the applicable award rate. I also find that the estimates β(explicit incentives) > β(award) and this difference is also highly significant (p-value<.01). I had no strong prior on any difference between performance pay versus time pay. The former relative to the latter has the advantage, from a fairness perspective, of automatically adjusting compensation to a worker's ability and effort but at the disadvantage of possible subjective performance evaluation which might be manipulated by the employer (see Predergast [1999]). Finally, I find that the estimates β(overaward) > β(explicit incentives) but the difference is not statistically significant.

(manager's evaluation of employee/management relationship, workplace labour productivity, and workplace profitability). Reciprocity, both positive and negative, will be examined first without any controls for payment scheme and then with such controls to focus on more fine-tuned considerations of attribution and crowding-out. Regression analysis will be carried out using the ordinal logit framework.

With the worker-level regressions, the estimating equations take the form of

$$y^*_{ik} = \alpha + \delta_F \, Fair\ wage_{ik} + \delta_U \, Unfair\ wage_{ik} + \beta \, X_{ik} + \gamma \, Z_k + e_{ik} \qquad (2a)$$

or

$$\begin{aligned} y^*_{ik} = {} & \alpha + \theta_{Ov} \, OverawardEE_k + \theta_{Ei} \, Explicit\ IncentivesEE_{ik} + \theta_{Ot} \, OtherEE_{ik} \\ & + \delta_{FOv} \, Fair\ wage_{ik} \bullet OverawardEE_k + \delta_{FEi} \, Fair\ wage_{ik} \bullet Explicit\ IncentivesEE_{ik} \\ & + \delta_{FAw} \, Fair\ wage_{ik} \bullet AwardEE_{ik} + \delta_{FOt} \, Fair\ wage_{ik} \bullet OtherEE_{ik} \\ & + \delta_{UOv} \, Unfair\ wage_{ik} \bullet OverawardEE_k + \delta_{UEi} \, Unfair\ wage_{ik} \bullet Explicit\ IncentivesEE_{ik} \\ & + \delta_{UAw} \, Unfair\ wage_{ik} \bullet AwardEE_{ik} + \delta_{UOt} \, Unfair\ wage_{ik} \bullet OtherEE_{ik} \\ & + \beta \, X_{ik} + \gamma \, Z_k + e_{ik} \end{aligned} \qquad (2b)$$

with coefficient subscripts "*F*" for Fair, "*U*" for Unfair, "*Ov*" for Overaward, "*Ei*" for Explicit Incentives, "*Aw*" for Award, and "*Ot*" for Other and the variable subscripts index worker i and workplace k and the variables X_{ik} and Z_k are the same as those used in wage equation (1). Equation (2b) differs from (2a) by including controls for payment scheme as well as these controls interacted with the *Fair wage* and *Unfair wage*, variables which indicate if the employee agrees or disagrees, respectively, that he/she is paid fairly.

The workplace-level regressions take a similar form

$$y^*_k = \alpha + \delta_F \, \%\, fair_k + \delta_U \, \%\, unfair_k + \gamma \, Z_k + e_k \qquad (3a)$$

or

$$\begin{aligned} y^*_k = {} & \alpha + \theta_{Ov} \, OverawardWP_k + \theta_{Ei} \, Explicit\ IncentivesWP_k + \theta_{Ot} \, OtherWP_k \\ & + \delta_{FOv} \, \%\, fair_k \bullet OverawardWP_k + \delta_{FEi} \, \%\, fair_k \bullet Explicit\ IncentivesWP_k \\ & + \delta_{FAw} \, \%\, fair_k \bullet AwardWP_k + \delta_{FOt} \, \%\, fair_k \bullet OtherWP_k \\ & + \delta_{UOv} \, \%\, unfair_k \bullet OverawardWP_k + \delta_{UEi} \, \%\, unfair_k \bullet Explicit\ IncentivesWP_k \\ & + \delta_{UAw} \, \%\, unfair_k \bullet AwardWP_k + \delta_{UOt} \, \%\, unfair_k \bullet OtherWP_k \\ & + \gamma \, Z_k + e_{ik} \end{aligned} \qquad (3b)$$

except the worker index is dropped along with worker-specific variables X_{ik}. In addition, the wage fairness variables indicate the proportion of workers at the workplace who agreed that they were paid fairly or the proportion that disagreed.

The pay scheme variables include a suffix, either EE for employee or WP for workplace, to indicate that the variables do depend on the unit of observation. The excluded pay category is

Award . The excluded wage fairness category depends on the unit of observation and is either those who neither agree nor disagree that they are paid fairly or those who feel that way as a proportion of workers surveyed at the workplace.

Equations (2) and (3) are proposed as means to detect reciprocity. None of these equations are structural. For example, I do not model the choice of payment scheme at the workplace. This choice will undoubtedly depend in part on the proportion of workers at the workplace who behave reciprocally as opposed to those who pursue pure self-interest with little concern for fairness.[20] Furthermore, overaward compensation rather than award or explicit incentives will best foster the reciprocity benefits given the earlier discussion on intentions and crowding-out.

It is in no way obvious, given the available survey data, how to model or control for the selection by employers of offering a fair or unfair wage and of the choice of payment scheme. Hence, I do not interpret the δ coefficients as structural or deep behavioural parameters revealing the magnitude of reciprocity for the population of Australian workers. These coefficients simply indicate reciprocal behaviour conditioned on or given the AWIRS 95 sample of workers under each payment scheme and their perceptions of wage fairness.

Nevertheless, the sign of those coefficients should reveal the existence of any reciprocity. The fair wage parameters δ_F and δ_{F**} should be positive indicating positive reciprocity while the unfair wage parameters δ_U and δ_{U**} negative consistent with negative reciprocity. Given the discussion above about employer choice of payment schemes, reciprocity should be most evident with overaward compensation.

C. Do Fair Wages Lead to Greater Job Effort by Workers?

In laboratory studies such as the gift-exchange experiments examining whether workers work harder in response to a fair wage, subjects generally do not expend actual effort but instead choose a number that represents effort which has a positive monetary cost impact for the subject (see, e.g., Gächter and Falk [2002]). More recently to add greater realism, studies have pursued "real effort" experiments where employees have to complete tasks such as cracking walnuts (Fahr and Irlenbusch [2000]) or solving mazes on a computer monitor (Gneezy [2004]). In contrast, I examine worker effort on their regular job as opposed to a hypothetical or narrowly defined temporary task. I use the self-reported responses (variable *Job effort*) to the following

[20] Several experimental studies find that in one-shot situations about 40 to 66 percent of subjects exhibit reciprocal choices while 20 to 30 percent do not reciprocate but act completely selfishly (Fehr and Gächter [2000], p. 162). In multi-stage situations where agents have reward/punishment opportunities, however, employers or workers with

AWIRS 95 survey question restricted to those who have autonomy or discretion in how or in how hard they perform their job.[21]

Do you agree or disagree with the following statements? . . .

"I put a lot of effort into my job"

	"Agree" = +1	"Neither agree nor disagree" = 0	"Disagree" = -1	Total
All Employees*	92.3 %	6.4 %	1.3 %	N = 10,306
Male*	90.8 %	7.6 %	1.6 %	N = 5,671
Females*	94.1 %	4.9 %	1.0 %	N = 4,610

*restricted to those who report having a lot of influence or input in how they do their work and/or in the pace at which they do their job

Notice that the overwhelming majority of all employees (over 92%) report expending a lot of effort on the job while about 1% do not. In addition, females relative to males, are more likely to report putting higher job effort. This high evaluation of worker-reported effort with little variability is found in other surveys and is not simply an artefact of allowing just three possible responses.[22] For example, mean self-reported job effort for 213 women in the 1986 Eugene-Springfield Labor Survey was 9.3 out of a 1 to 11 scale with a standard deviation of 1.6. Only 14% report a job effort level less than 8 while nearly a third (31%) report the highest level of 11 (Stratton [2001], p. 71).

Since my effort measure is self-reported, I check whether the responses have a sensible impact on wages. I do so by re-estimating the earlier wage equation (1) by gender but now supplementing the right-hand side control variables with indicator variables for the effort statement response "Neither agree nor disagree" and for the response "Disagree". Relative to the excluded category "Agree", these indicator variables should have a negative wage impact assuming that lesser effort leads to lower labour productivity and thus lower compensation. The estimated coefficients generally have the wrong (i.e., positive) sign but are statistically insignificant. One notable exception, however, is that women who disagree that they put a lot of

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selfish motivations may act differently,e.g., behave cooperatively, when they expect others to behave in a reciprocal manner (see Fehr, Gächter, and Kirchsteiger [1997]).

[21] AWIRS 95 asked separately, "In general, how much influence or input do you have about the following? . . . How you do your work. . . The pace at which you do your job . . ." Possible responses could be "A lot," " Some," "A little," or "None." The majority of respondents choose "A lot" for either or both statements. I focus on this sub-sample to isolate workers who had discretion in their job effort rather than those who may be monitored closely and are compelled to work hard. Interestingly, those who had this discretion at work are more likely to report greater effort in their job relative to other workers.

[22] See Stratton [2001] (pp. 70-71) for summary statistics of reported job effort for women in the 1977 Quality of Employment Survey and 1986 Eugene-Springfield Labor Survey.

effort in their job, relative to those who agree, receive a 13.3 % wage premium, all else equal, which is highly significant (*p*-value<.01). This premium drops to 6.3 % and loses its statistical significance if the estimation sample is restricted only to females who have discretion in how or how hard they do their job. The generally incorrect signs and the surprising 13.3 % wage premium for women workers who are slack in work effort lead to concern over the objective accuracy of this self-reported effort measure.

Receiving fair or unfair wages has little impact on worker effort. The empirical results for male and female employees are found on Tables 5 and 6, respectively. Examining the male results first, evidence of reciprocity is sparse and inconsistent. Without controlling for pay scheme (see col. 1 and 2), *Fair wage* has a positive impact which suggests positive reciprocity but is statistically insignificant. The coefficient δ_U for *Unfair wage*, however, has an unexpected positive sign which is incompatible with negative reciprocity and, once additional controls are added, even weakly significant (p-value<.061).

Column 4 in Table 5 reports the results with controls for payment scheme interacted with the wage fairness indicators together with additional explanatory variables. No statistically significant positive reciprocity effects are found. The coefficient δ_{U**} for *Unfair wage* now interacted with the pay scheme variables has the incorrect positive sign except when interacted with *Explicit Incentives* which is negative and weakly significant (*p*-value<.074). The negative sign indicates that, among performance pay workers, those who feel they are not paid fairly are less likely to put a lot of effort in their job relative to those who have a neutral opinion on their pay. While *Explicit incentives* is the lone case which exhibits negative reciprocity, it is also the only pay scheme when interacted with *Fair wage* which has a negative coefficient albeit insignificant statistically. This negative sign is not compatible with any reciprocity interpretation.

The results for females in Table 6 show even less support for reciprocity. Once other controls are added to the regression equations, any statistically significant coefficients for the *Fair wage* and *Unfair wage* variables, alone or when interacted with pay scheme, lose their significance. Generally, the *Unfair wage* coefficient has the wrong (i.e., positive) sign. As in the case of males, females who receive an overaward, which is the pay scheme most likely to foster reciprocity, show little evidence of reciprocating in their job effort and indeed some evidence to the contrary. As footnoted in Table 6, all females in the regression sample who received an *Unfair wage* under an *Overaward* reported putting a lot of effort in their job. Not one reciprocated with a lesser amount of effort.

Since the sample is restricted to workers who have discretion in how or how hard they work, why workers who are paid unfairly yet still put in a lot of work effort is very puzzling from a reciprocity perspective. Cognitive dissonance, which has been used elsewhere in the economics literature (see, e.g., Akerlof and Dickens [1982]), may perhaps solve the puzzle. Suppose that a worker's attitude or belief about pay is that his/her pay is unfair. Further suppose that the worker's actual, as opposed to reported, level of effort is quite low due to negative reciprocity. Note that the AWIRS 95 employee survey question on pay fairness is followed shortly thereafter by the survey question on job effort. To justify to oneself as well as to others (e.g., the surveyor) the "unfair" belief about pay, the worker reports a belief that he/she exerts a great deal of job effort. This discussion reinforces the earlier caution of relying on the self-reported responses on worker effort.

D. Do Fair Wages Lead to Better Workplace Labour Relations?

Reciprocity by workers might be revealed not only in the amount of work effort but in their working relationship with management. How happy or unhappy workers are with their pay may influence whether they are supportive or antagonistic, respectively, in dealing with management. Here I rely on the AWIRS 95 survey question of the most senior manager at the workplace which asks

How would you rate the relationship between employees and management at this workplace?

"Very good" = +2	"Good" = +1	"Neither good nor poor" = 0	"Poor" = -1	"Very poor" = -2
36.3%	53.2%	8.7%	1.8%	0.2%

N = 2000 responses

The above responses form the variable *Labour relations*. Notice that almost 90% of the workplaces have favourable while only 2% unfavourable labour relations.

The percentage of workers at the workplace who receive fair or unfair wages has some impact on labour relations. Without controls for pay scheme, there is no evidence of positive reciprocity (see Table 7, col. (1) and (2)). Support for negative reciprocity in workplace relations, however, is found in the strongly significant, negative coefficients for *% unfair*. Controlling for pay scheme as well as other workplace covariates, I generally find that the estimates for δ_{F**} to be positive and for δ_{U**} to be negative which are the correct signs for positive and negative reciprocity, respectively (see Table 7, col. (4)). The only statistically significant coefficients are for δ_{FOv} (p-value<0.04) and for δ_{UOt} (p-value<0.003). The former

implies that the greater the proportion of workers who feel that their *Overaward* wage is fair increases the likelihood of more favourable labour relations. The latter indicates that the larger the proportion of workers who feel their *Other* wage is unfair decreases that likelihood. All in all, the results here focusing on the manager's evaluation of labour relations are consistent with the results reported earlier that wage fairness influences workers' evaluation of their workplace and management.

E. Do Fair Wages Lead to Higher Labour Productivity?

Now I focus on management's evaluation of workplace labour productivity using the most senior manager's response to the survey question

In your opinion, how does the level of labour productivity here compare with your major competitors?

"A lot higher" = +2	"A little higher" = +1	"About the same" = 0	"A little lower" = -1
14.5%	34.5%	38.9%	10.1%

"A lot lower" = -2

2.1%

N = 2000 responses

If the workplace was not commercial (i.e., profit seeking), the respondent was asked to compare productivity to other similar workplaces. The above responses form the variable *Labour productivity*. Notice that this variable is a relative productivity measure with almost half (49%) of the managers reporting higher productivity than their major competitors and less than an eighth (12.2%) indicating lower productivity. The skewed upward distribution of responses may very well reflect a biased optimism of managers.

This measure of labour productivity has advantages and disadvantages relative to the variable *Job effort* used earlier where concerns over the reliability of the self-reported measure of worker effort were raised. On the positive side, the *Labour productivity* measure is reported by the manager, not by the worker, which hopefully provides greater objectivity in measuring effort or, in this case, evaluating the productivity impact of that effort. On the negative side, this variable provides not an absolute metric but a relative comparison to the major competitors of the workplace. If these competitors exercise the same fair wage policy as the surveyed workplace (i.e., firms with identical products and competitive advantages use similar technology or human resource practice), then the productivity impact of reciprocity will be hard to detect with this variable.

Without controls for payment arrangement, there is no evidence of positive reciprocity and, in fact, the coefficients δ_F have the wrong, negative sign (see Table 8, cols. (1) and (2)). In contrast, support for negative reciprocity is found with negative and weakly statistically significant coefficients δ_U . Controlling for payment scheme, the first thing to notice is that none of the reciprocity coefficients δ_{F**} and δ_{U**} are even weakly significant (see Table 8, cols. (3) and (4)). Generally, the positive reciprocity coefficients δ_{F**} have the wrong, negative sign while the negative reciprocity coefficients δ_{U**} have the correct, negative sign. The exception in both cases pertain to reciprocity with *Overaward* payments. The estimates for δ_{FOv} and for δ_{UOv} are both positive but statistically insignificant. My overall assessment of the labour productivity results in Table 8 is that there is some weak evidence for negative reciprocity but none for positive reciprocity. Interestingly, support for negative reciprocity is not found in *Overaward* payments which were expected to offer the best case for detecting reciprocity.

F. Do Fair Wages Raise Profitability?

So far, the evidence of reciprocity at the workplace in response to wage fairness is not overwhelming. The only statistically significant impacts can be found in *Labour relations* under certain pay schemes and with negative reciprocity in *Labour productivity*. Nevertheless, suppose that fair and unfair wages have strong reciprocity effects on workplace productivity and that wage fairness is positively correlated to the wage rate as documented in Sec III.A. Does offering fair wages payoff for the employer? Are they profitable?

To address these questions, I use the senior workplace manager's response to the survey question

In the last financial year, did this workplace make
a pre-tax profit, break even or make a loss?

"Profit" = +1	"Break even" = 0	"Loss" = -1	
74.6 %	9.2 %	16.2 %	N = 1,281

Only commercial (i.e., profit seeking) workplaces which were not an administrative office were asked this question. The above responses form the variable *Profitability*. The high percentage of profitable workplaces is not surprising given that the question deals with accounting as opposed to economic profits. In addition, the Australian economy was steadily expanding with annual GDP growth of at least 3.5% for the period framing the survey window (i.e., the 1992-93 to 1996-97 financial years).

Offering fair or unfair wages has no statistically significant impact on workplace profitability. Table 9 displays the econometric results from the ordered logit regressions. Without controls for pay scheme (see Table 9, cols. (1) and (2)), the coefficient estimates for both *% fair* and *% unfair* are all negative which matches the earlier results found for *Labour relations* and *Labour productivity* . A negative point estimate for δ_F is inconsistent with positive reciprocity and a greater likelihood of higher profits although a negative δ_U is supportive of negative reciprocity effects on profits. Adding controls for pay scheme does not greatly change the pattern of signs for the coefficient estimates (see Table 9, cols. (3) and (4)). The signs of the estimates for δ_{F**} and δ_{U**} are generally negative. Focusing only on *Overaward* workplaces, the estimates for both δ_{FOv} and δ_{UOv} are negative and do not provide any stronger evidence of reciprocity.

Given the lack of any statistically significant impacts on profitability, I conclude that workplaces with a greater proportion of fair (unfair) wage workers are not likely to be more (less) profitable than other workplaces. Even assuming that workers reciprocate in their job performance and in labour relations, the productivity impact is negligible and/or completely offset by any wage changes that might be linked to wage fairness.

VI. Summary and Conclusion

The value added of this study is to examine worker reciprocity to fair wages using an extensive, matched survey of workers and workplaces where workers were asked whether they felt their pay for the work that they do was fair. Fairness perceptions of the wage definitely seem to be linked to the difference between the worker's wage and what would be expected from a conventional wage regression. In addition, workers who report that they are paid fairly tend to look upon their job, workplace, and management favourably.

With regard to the main topic of reciprocity, I use a variety of indicators to detect a worker responding positively to a fair wage or negatively to an unfair wage. One of the indicators is at the worker-level (self-reported worker effort) and the others at the workplace-level (manager's evaluation of workplace labour relations, labour productivity, and profitability).

The econometric examination excludes and includes controls for pay schemes. As best as possible given the available survey data, I attempt to isolate a pay scheme (overaward) where wages are set, not negotiated, by management and are not based exclusively on a measure of performance. Given results in the experimental literature supporting intentions-based reciprocity and the crowding out of reciprocity by explicit incentives, the overaward scheme is viewed as the best setting to reveal reciprocity.

Without controls for pay scheme, I find no evidence in support of positive reciprocity. Employees who are paid fairly are not more likely to put greater effort in their job relative to those who feel that their pay is neither fair nor unfair. Managers of workplaces with a greater proportion of fair wage workers do not report better labour relations, labour productivity, nor profitability. In contrast, some evidence in favour of negative reciprocity is found. Paying unfair wages has a negative and highly statistically significant impact on workplace relations and a negative, although weakly significant impact, on productivity. Detecting negative but not positive reciprocity is consistent with experimental results that generally find that the former seems to be a stronger behavioural impulse than the latter.

Adding controls for pay scheme yields few statistically significant effects for either fair or unfair wages. More importantly, this addition fails to confirm more nuanced aspects of reciprocity linked to causal attribution of intentions and the crowding out of reciprocity by explicit performance incentives. Reciprocity is not more apparent under overawards than other pay schemes. Overall, I find no strong, statistically significant, and consistent evidence of positive reciprocity and only some, perhaps weak, evidence of negative reciprocity using a large sample of Australian workers and workplaces.

The strong, clear picture of worker reciprocity found in the experimental literature is not found in my work using survey data of real employees in normal employment situations. One explanation for the difference may be the superior controls available in laboratory settings. The results of this study suffer from the usual endogeneity problems or challenges inherent in most econometric work using survey data. In particular, I do not model nor control for the choice of paying fair or unfair wages nor the choice of payment scheme. I cannot rule out the possibility that employers choose fair wages for workers who they know have reciprocal impulses and will respond with high effort. For workers without such impulses, the employers rely on other devices (e.g., monitoring, performance pay) to instil high effort. My ability to detect reciprocity is obscured by this possible sample selection bias.

The failure to account for this endogeneity or selectivity is a major concern but may not entirely account for the difference in results here relative to laboratory studies. The value added of this study is examining workers in genuine, everyday workplaces. The external validity of labour market experimental results depend on whether the design and assumptions of the experiments capture the essential aspects that exist in reality (Falk and Fehr [2003], p. 403).

Let me speculate where one important assumption might contribute to the difference in results. Labour market reciprocity experiments generally emphasize or assume a principal-agent setup where labour contracts are incomplete with major limitations in verifying worker effort as

in the gift-exchange game described in Section II. For example in Fehr, Gächter, and Kirchsteiger [1997], employers, by assumption, can detect shirking only 50% of the time in the experimental conditions or treatments which permit reciprocity.[23] In what they call the *no-reciprocity-treatment*, however, ". . . contract terms [i.e., effort demanded by the employer] are exogenously enforced so that reciprocity cannot contribute to contract enforcement; . . ." (p. 835). The experimental design recognizes that if firms can observe and enforce effort, then worker reciprocity is not an important consideration.

Perhaps, the laboratory setups that generate reciprocity results exaggerate the principal-agent problem found in most, real life employment situations where the employer's ability to observe and verify worker effort over time may be imperfect but not greatly so. To be fair, I know of no empirical estimate than can guide experimentalists in parameterizing the degree of the asymmetric information problem to match reality. Related to the observability of labour productivity, perhaps employers can specify effort as in Herbert Simon's concept of the employment relationship where the worker accepts and obeys the authority of the employer to choose "the given set of tasks, *performed at a particular rate of working, a particular level of accuracy, and so forth* [emphasis mine]" (Simon [1951], p. 294). The perspective of employees ceding authority to employers in the employment relationship may explain why workers, who complain about being "overworked and underpaid," are restricted in their ability to negatively reciprocate and work less. Maybe the employer, not worker reciprocity, largely determines the level of work effort.

[23] In other experiments dealing with the crowding out of reciprocity by explicit incentives, the probability of detection is set even lower at 33⅓ % (see Fehr and Gächter [2002]).

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TABLE 1: Summary Statistics

TABLE 2: Wage Fairness and Wage Residuals

Dependent variable: *Get paid fairly*

Explanatory Variables	Male Employees		Female Employees	
(wage residuals)	(1)	(2)	(3)	(4)
$\hat{e}_{ik}$ ($\equiv \hat{c}_i + \hat{u}_{ik}$)	1.089*** (0.092)	____	0.679*** (0.090)	____
$\hat{c}_i$	____	1.319*** (0.153)	____	0.908*** (0.156)
$\hat{u}_{ik}$	____	0.903*** (0.094)	____	0.570*** (0.091)
Log-likelihood	-8487.9	-8481.5	-6791.8	-6788.9
Model test: $\chi^2(1)$	138.4***	141.1***	57.2***	56.9***
Number of employees	8304	8304	6579	6579

Notes:

1. The *Get paid fairly* variable captures the employee response to the statement: *"I get paid fairly for the things I do in my job"* Responses coded as "Agree" = +1, "Neither agree nor disagree" = 0, and "Disagree" = -1 .
2. Estimation method is ordered logit regression with robust variance matrix estimator allowing for observations to be independent across but not necessarily within workplace clusters.
3. *, **, and *** indicate significance at the ten, five, and one percent levels, respectively.
4. Robust standard errors are shown in parentheses.
5. Wage residuals are drawn from fixed effects estimation of wage equation (1) estimated separately by gender.

TABLE 3: Job Satisfaction, Favourable Employment Relations, and Wage Fairness

Explanatory Variables of Interest	Male Employees				Female Employees			
	Dependent Variables							
	Satisfied with job	Good place to work	How management treats workers	Management gets on with employees	Satisified with job	Good place to work	How management treats workers	Management gets on with employees
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fair wage	1.004***	0.947***	0.682***	0.623***	0.926***	0.918***	0.666***	0.481***
	(0.063)	(0.063)	(0.058)	(0.061)	(0.077)	(0.072)	(0.067)	(0.069)
Unfair wage	-0.577***	-0.373***	-0.647***	-0.440***	-0.621***	-0.376***	-0.466***	-0.405***
	(0.061)	(0.063)	(0.061)	(0.064)	(0.074)	(0.075)	(0.070)	(0.075)
Log-likelihood	-6025.9	-6350.3	-7085.0	-6717.6	-4341.0	-4680.9	-5451.2	-4945.3
Model test: $\chi^2(78)$	1263.0***	874.6***	1218.3***	917.7***	699.8***	639.9***	707.9***	515.7***
No. of employees	7271	7229	7175	7236	5582	5574	5514	5552

Notes:

1. Estimation method is ordered logit regression with robust variance matrix estimator allowing for observations to be independent across but not necessarily within workplace clusters.
2. *, **, and *** indicate significance at the ten, five, and one percent levels, respectively.
3. Robust standard errors are shown in parentheses.
4. Other controls include variables X_{ik} and Z_k used in the wage regressions described in Section IV.

TABLE 4: Distribution of Employees and Workplaces Across Payment Schemes

Payment Scheme	Employees†		Workplaces‡
	Male	Female	
Overaward	389	208	109
Explicit Incentives	158	133	63
Award	847	1246	562
Other	4390	3097	1267
Total	5784	4684	2001

† Employees considered here are restricted to those in the AWIRS 95 survey sample who indicate that they have a lot of influence or input into how or how hard they do their job. This restriction is imposed to match the regression sample used in the analysis of worker effort reported in Tables 5 and 6.

‡ Workplaces considered here are all those in the AWIRS 95 survey sample population.

TABLE 5: Job Effort and Wage Fairness – Males

Dependent variable: *Job effort*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
Fair wage	0.172 (0.121)	0.172 (0.141)	____	____
Unfair wage	0.168 (0.128)	0.298* (0.160)	____	____
OverawardEE	____	____	0.008 (0.422)	0.441 (0.485)
Explicit IncentivesEE	____	____	0.797 (0.733)	1.559 (1.021)
OtherEE	____	____	0.170 (0.263)	0.333 (0.302)
Fair wage • *OverawardEE*	____	____	0.329 (0.363)	0.319 (0.364)
Fair wage • *Explicit IncentivesEE*	____	____	-0.236 (0.636)	-0.726 (1.115)
Fair wage • *AwardEE*	____	____	0.240 (0.282)	0.416 (0.348)
Fair wage • *OtherEE*	____	____	0.133 (0.144)	0.130 (0.166)
Unfair wage • *OverawardEE*	____	____	0.078 (0.485)	0.169 (0.662)
Unfair wage • *Explicit IncentivesEE*	____	____	-1.131 (0.865)	-2.133* (1.193)
Unfair wage • *AwardEE*	____	____	0.292 (0.296)	0.428 (0.362)
Unfair wage • *OtherEE*	____	____	0.170 (0.150)	0.342* (0.184)
Controls *X* and *Z*	No	Yes	No	Yes

Log-likelihood	-1930.7	-1334.2	-1928.7	-1330.2
Model test	$\chi^2(2)$ = 2.37	$\chi^2(77)$ = 175.47***	$\chi^2(11)$ = 6.31	$\chi^2(86)$ = 200.79***
Number of employees	5546	4023	5546	4023

Notes:

1. The *Job effort* variable captures the employee response to the statement: *"I put a lot of effort into my job"*. Responses coded as "Agree" = +1, "Neither agree nor disagree" = 0, and "Disagree" = -1 .
2. I restrict the AWIRS 95 sample of male employees to those who have great discretion in performing their job. In response to survey statements, they report that they have a lot of influence or input in "How you do your work" and/or in "The pace at which you do your job."
3. Estimation method is ordered logit regression with robust variance matrix estimator allowing for observations to be independent across but not necessarily within workplace clusters.
4. *, **, and *** indicate significance at the ten, five, and one percent levels, respectively.
5. Robust standard errors are shown in parentheses.
6. Control variables X_{ik} and Z_k are the same as those used in the wage regressions described in Section IV.

TABLE 6: Job Effort and Wage Fairness - Females

Dependent variable: *Job effort*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
Fair wage	0.349**	0.149	____	____
	(0.155)	(0.201)		
Unfair wage	0.458**	0.302	____	____
	(0.188)	(0.237)		
OverawardEE	____	____	0.061	-0.219
			(0.505)	(0.650)
Explicit IncentivesEE	____	____	0.004	0.713
			(0.650)	(1.057)
OtherEE	____	____	0.615**	0.557
			(0.274)	(0.381)
Fair wage • *OverawardEE*	____	____	0.594	0.962
			(0.501)	(0.606)
Fair wage • *Explicit IncentivesEE*	____	____	1.315	.313
			(0.969)	(1.272)
Fair wage • *AwardEE*	____	____	0.634**	0.082
			(0.268)	(0.359)
Fair wage • *OtherEE*	____	____	0.132	0.090
			(0.207)	(0.256)
Unfair wage • *OverawardEE*	____	____	†	‡
Unfair wage • *Explicit IncentivesEE*	____	____	0.357	-0.112
			(0.924)	(1.463)
Unfair wage • *AwardEE*	____	____	1.061***	0.649
			(0.355)	(0.466)
Unfair wage • *OtherEE*	____	____	0.083	0.057
			(0.242)	(0.298)
Controls *X* and *Z*	No	Yes	No	Yes

Log-likelihood	-1108.7	-706.9	-1101.1	-700.2
Model test	$\chi^2(2)$ = 7.01**	$\chi^2(76)$ = 131.88***	$\chi^2(10)$ = 17.20*	$\chi^2(84)$ = 138.37***
Number of employees	4469	3065	4415	3023

† Perfect prediction problem discussed in Sec. II.C. encountered. All 54 female observations in the regression sample which reported an *Unfair wage* and also received an *Overaward* had no variability in the effort variable. All agreed that they put a lot of effort in their job (*Job effort* = +1). The lack of *sample* variability suggests that the impact of that particular combination of explanatory variables in the *population* is large leading to a high probability of the outcome *Job effort* = +1 .

‡ Perfect prediction problem discussed in Sec. II.C. encountered. All 42 female observations in the regression sample which reported an *Unfair wage* and also received an *Overaward* had no variability in the effort variable. All agreed that they put a lot of effort in their job (*Job effort* = +1). The lack of *sample* variability suggests that the impact of that particular combination of explanatory variables in the *population* is large leading to a high probability of the outcome *Job effort* = +1 .

Notes:

1. The *Job effort* variable captures the employee response to the statement: *"I put a lot of effort into my job"* Responses coded as "Agree" = +1, "Neither agree nor disagree" = 0, and "Disagree" = -1 .
2. I restrict the AWIRS 95 sample of female employees to those who have great discretion in performing their job. In response to survey statements, they report that they have a lot of influence or input in "How you do your work" and/or in "The pace at which you do your job."
3. Estimation method is ordered logit regression with robust variance matrix estimator allowing for observations to be independent across but not necessarily within workplace clusters.
4. *, **, and *** indicate significance at the ten, five, and one percent levels, respectively.
5. Robust standard errors are shown in parentheses.
6. Control variables X_{ik} and Z_k are the same as those used in the wage regressions described in Section IV.

TABLE 7: Workplace Labour Relations and Wage Fairness

Dependent variable: *Labour relations*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.144 (0.279)	-0.063 (0.311)	____	____
% unfair	-1.140*** (0.297)	-1.014*** (0.355)	____	____
OverawardWP	____	____	-0.268 (0.610)	-0.319 (0.643)
Explicit IncentivesWP	____	____	1.488 (1.502)	1.193 (1.490)
OtherWP	____	____	0.976** (0.464)	1.214** (0.500)
% fair • OverawardWP	____	____	1.099* (0.613)	1.404** (0.685)
% fair • Explicit IncentivesWP	____	____	-0.162 (1.868)	0.517 (1.891)
% fair • AwardWP	____	____	0.945** (0.470)	0.764 (0.505)
% fair • OtherWP	____	____	-0.621* (0.377)	-0.426 (0.409)
% unfair • OverawardWP	____	____	-0.409 (0.910)	-0.843 (0.953)
% unfair • Explicit IncentivesWP	____	____	-3.144 (2.274)	-2.344 (2.310)
% unfair • AwardWP	____	____	0.081 (0.490)	0.318 (0.555)
% unfair • OtherWP	____	____	-1.526*** (0.407)	-1.353*** (0.458)
Controls *Z*	No	Yes	No	Yes

Log-likelihood	-1824.4	-1454.3	-1669.6	-1435.7
Model test	$\chi^2(2)$ = 24.56***	$\chi^2(42)$ = 249.75***	$\chi^2(11)$ = 35.94***	$\chi^2(51)$ = 257.75***
Number of workplaces	1825	1562	1670	1544

Notes:

1. The *Labour relations* variable captures the response of the most senior workplace manager to the question: *"How would you rate the relationship between employees and management at this workplace?"* Responses coded as "Very good" = +2, "Good" = +1, "Neither good nor poor" = 0, "Poor" = -1, and "Very poor" = -2 .
2. Estimation method is ordered logit regression with robust variance matrix estimator.
3. *, **, and *** indicate significance at the ten, five, and one percent levels, respectively.
4. Robust standard errors are shown in parentheses.
5. Control variables Z_k same as those used in the wage regressions described in Section IV.

TABLE 8: Workplace Labour Productivity and Wage Fairness

Dependent variable: *Labour productivity*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.143 (0.288)	-0.185 (0.322)	____	____
% unfair	-0.535* (0.301)	-0.579* (0.348)	____	____
OverawardWP	____	____	-0.284 (0.668)	-0.328 (0.678)
Explicit IncentivesWP	____	____	0.342 (1.382)	0.499 (1.325)
OtherWP	____	____	-0.107 (0.522)	-0.030 (0.533)
% fair • OverawardWP	____	____	0.198 (0.617)	0.164 (0.628)
% fair • Explicit IncentivesWP	____	____	-0.676 (1.617)	-0.647 (1.557)
% fair • AwardWP	____	____	0.060 (0.579)	-0.052 (0.583)
% fair • OtherWP	____	____	-0.087 (0.367)	-0.137 (0.386)
% unfair • OverawardWP	____	____	0.279 (1.137)	0.364 (1.157)
% unfair • Explicit IncentivesWP	____	____	-0.965 (1.926)	-1.126 (2.039)
% unfair • AwardWP	____	____	-0.693 (0.567)	-0.616 (0.576)
% unfair • OtherWP	____	____	-0.359 (0.373)	-0.501 (0.407)
Controls *Z*	No	Yes	No	Yes

Log-likelihood	-2216.2	-1906.1	-2034.8	-1885.7
Model test	$\chi^2(2)$ = 4.96*	$\chi^2(27)$ = 49.27***	$\chi^2(11)$ = 6.58	$\chi^2(36)$ = 50.03*
Number of workplaces	1660	1430	1520	1413

Notes:

1. The *Labour productivity* variable captures the most senior workplace manager's response to the question: *"In your opinion, how does the level of labour productivity here compare with your major competitors?"* Responses coded as "A lot higher" = +2 , "A little higher" = +1 , "About the same" = 0 , "A little lower" = -1 , and "A lot lower" = -2 .
2. Estimation method is ordered logit regression with robust variance matrix estimator.
3. *, **, and *** indicate significance at the ten, five, and one percent levels, respectively.
4. Robust standard errors are shown in parentheses.
5. Control variables Z_k same as those used in the wage regressions described in Section IV except I drop the 15 industry dummies which are unnecessary here. These controls are unnecessary since the workplace productivity comparison in the dependent variable is to other competitors presumably within the same industry.

TABLE 9: Workplace Profitability and Wage Fairness

Dependent variable: *Profitability*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.600 (0.477)	-0.188 (0.488)	____	____
% unfair	-0.563 (0.485)	-0.556 (0.539)	____	____
OverawardWP	____	____	1.034 (0.863)	1.424 (0.914)
Explicit IncentivesWP	____	____	-0.092 (2.341)	0.325 (2.331)
OtherWP	____	____	0.031 (0.739)	0.356 (0.788)
% fair • OverawardWP	____	____	-1.090 (0.834)	-0.890 (0.929)
% fair • Explicit IncentivesWP	____	____	-0.161 (2.281)	0.795 (2.467)
% fair • AwardWP	____	____	-0.714 (0.733)	-0.570 (0.755)
% fair • OtherWP	____	____	0.018 (0.623)	0.305 (0.688)
% unfair • OverawardWP	____	____	-1.413 (1.475)	-1.389 (1.592)
% unfair • Explicit IncentivesWP	____	____	6.346 (5.942)	4.446 (4.458)
% unfair • AwardWP	____	____	-0.471 (0.784)	-0.008 (0.844)
% unfair • OtherWP	____	____	-0.395 (0.659)	-0.469 (0.723)
Controls *Z*	No	Yes	No	Yes

Log-likelihood	-851.8	-718.0	-779.6	-698.2
Model test	$\chi^2(2)$ = 1.86	$\chi^2(41)$ = 76.00***	$\chi^2(11)$ = 18.11*	$\chi^2(50)$ = 94.91***
Number of workplaces	1156	1028	1073	1018

Notes:

1. The *Profitability* variable captures the most senior workplace manager's response to the question: *"In the last financial year, did this workplace make a pre-tax profit, break even or make a loss?"* Responses coded as "Profit" = +1 , "Break even" = 0 , "Loss" = -1 .
2. Estimation method is ordered logit regression with robust variance matrix estimator.
3. *, **, and *** indicate significance at the ten, five, and one percent levels, respectively.
4. Robust standard errors are shown in parentheses.
5. Control variables Z_k same as those used in the wage regressions described in Section IV except I drop the non-commercial indicator variable as well as non-commercial workplaces. Non-commercial workplaces are not profit-seeking.