RECIPROCITY AT THE WORKPLACE: DO FAIR WAGES LEAD TO HIGHER EFFORT, PRODUCTIVITY, AND PROFITABILITY?

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Abstract

Numerous laboratory and field experiments have examined the importance of fairness and reciprocity in labour markets. Paying wages that are higher or lower relative to a specified or expected wage is considered fair or unfair treatment in these studies. 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. Reciprocity impacts are considered on worker effort, workplace relations, productivity, and profitability while controlling for the wage level. Controls for pay scheme are introduced to isolate a particular payment arrangement that would best foster reciprocity. Overall, no widespread evidence of positive reciprocity is found in Australian workplaces. I do find evidence of negative reciprocity in labour-management relations but that does not seem to impair workplace productivity or profitability.

Keywords: Fair wage, Reciprocity, Workplace

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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 or 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 often in laboratory settings.[1] 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 primary 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. By doing so, reciprocity is examined across a wide range of workers in their normal, everyday jobs. These jobs typically last for several years as opposed to a time horizon of perhaps a few weeks but generally at most a few hours of activity observed in lab and field experiments.

The long tenure of the surveyed workers may provide a fertile setting for reciprocity.[2] Reviewing evidence from laboratory and field experiments, Fehr, et al. [2009] state that while

[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].

" . . . the impact of fairness in one-shot interactions is likely to be small" (p. 368), ". . . even a small share of fair-minded workers can have a large impact on long-term employment relations because reputational concerns in repeated interactions greatly magnify the impact of fairness concerns" (p. 377). List [2009], however, questions the claim that fairness concerns lead to important effects over the long run and contends that further theoretical and empirical investigation is necessary.

Another important contribution or point of difference of this paper is using worker's own fairness evaluation of the wage to examine reciprocity. Reciprocity experiments focus on wages paid higher or lower relative to a specified or expected wage. With the exception of Cohn et al. [2013], these experiments do not have or use information on the worker's own fairness perception of the wage. While fairness is surely linked to wage levels, they are not one and the same. In contrast to these experimental studies that assume a high (low) or higher (lower) than expected wage is assumed to be fair (unfair), I rely on whether the worker agrees or disagrees with a survey statement *"I get paid fairly for the things I do in my job."*

The inherent subjectivity of the worker's wage judgement is unavoidable and desirable since the decision to reciprocate depends crucially on the worker's perception or beliefs about his or her wage.[3] Having the survey response is a distinct advantage since otherwise ascertaining what the worker believes is a very difficult task. Reviewing three different fairness studies, Kahneman, et al. [1986b, p. S299] state, "Perhaps the most important lesson learned from these studies is that the rules of fairness cannot be inferred either from conventional economic principles or from intuition and introspection." However, even

[2] Close to the period of the survey used for this study, for male (female) Australians working in February 1996, 77.6% (75.2%) had been at their current job for at least 1 year, 45.7% (39.0%) for at least 5 years, and 27.1% (18.3%) for at least 10 years. Source: My calculations based on figures reported in Australian Bureau of Statistics, *Labour Mobility, Australia*, February 1996, Catalogue No. 6209.9, Table 10, p. 21.

[3] 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."

knowing the "rules of fairness" is an imperfect predictor of how any individual would evaluate the fairness of his or her wage. Community surveys of fairness (see, e.g., Kahneman, et al. [1986a]) 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 will usually disagree. Wage fairness, like beauty, is in the eye of the beholder. Furthermore, evidence from Cohn et al.'s field experiment indicates that a worker's effort response depends crucially on the worker's fairness perception of the wage and not just simply on the wage.

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 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 with controls 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 fair wages are positively related to the wage level even after controlling for a wide range of worker and workplace characteristics. Fair wage workers are

also 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, little reliable 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 but does not impair workplace productivity nor profitability.

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 exhibits positive reciprocity in labour relations but otherwise does not provide any greater evidence of reciprocity than other pay schemes.

Taking into account all the results, I find no extensive evidence of positive reciprocity in Australian workplaces. Negative reciprocity is evident in labour-management relations but that does not carry over to workplace productivity nor profitability.

The paper is structured as follows: The next section discusses some relevant literature. 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 associated 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 possible sources of endogeneity bias (simultaneity, omitted variable bias, and selectivity) and their impacts on the reciprocity estimates are carefully considered. With regards to selection and treatment effects, experimental studies provide estimates of average treatment effects useful from a social policy perspective where, ignoring general equilibrium concerns, a fair or unfair wage treatment is exogenously imposed across workplaces and workers. This study yields estimates of average treatment effects on the treated where treatment is endogenously chosen by both employers and workers and is not externally dictated. These estimates for the treated provide insights for prospective managers of the reciprocity impacts experienced by managers who have selected a specific treatment as their best option. The final section provides a summary and concluding remarks.

II. Some Relevant Literature

Results from ultimatum bargaining game experiments aptly demonstrate negative reciprocity.[4] 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"),

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

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.

The degree of reciprocity depends on the type of reciprocity. An important stylized fact from both the economic and psychology literature is that negative and positive reciprocity are not symmetric with the former being stronger. "One of the key insights that can be taken from the decades of research within the social sciences is that reciprocity in

general is important, and that negative actions toward an individual induce a greater behavioural response than comparable positive actions" (Al-Ubaydli, et al. [2010], p. 524).

The reciprocity response of worker effort may disappear above the fair wage. Cohn et al.'s [2013] field experiment with alternating high and low wage treatments confirms Akerlof and Yellen's [1990] fair wage-effort hypothesis which posits that wages and effort move in the same direction if wages are below the fair wage. A wage hike leading to a wage closer to the fair wage increases effort while a wage cut lowering the wage below the fair wage decreases effort.[5] For wage changes which begin and end above the fair wage, however, a wage hike does not lead to workers feeling more fairly treated nor a wage cut less fairly treated. Reciprocity is not relevant and worker effort is unchanged.

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

[5] Note that Akerlof and Yellen do not specifically mention reciprocity as a motivation behind the co-movements of wages and effort when wages are unfair. Furthermore, effort is a function of the wage level regardless whether the wage level was achieved via a hike or cut in the wage. Hence, moving from a given low wage to a given high wage or vice-versa the respective positive or negative (reciprocity) effort changes will be of the same magnitude.

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 or, for that matter, whether even positive reciprocity is observed. He concludes that the attribution of volition is important in effort choice consistent with intentions-based reciprocity.[6]

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.[7] 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 and shirking is verified by an exogenous probability of detection. Experimental results indicate that average effort levels are lower under explicit performance incentives relative to 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.[8]

The contribution of this paper is to examine labour market reciprocity not with experimental data but using a large economy-wide survey of workers and workplaces. To the best of my knowledge, the only other paper which examines reciprocity using survey data is by Dohmen, et al. [2009]. That paper focuses on reciprocity inclinations, i.e., inherent personality traits or tendencies to reciprocate - first establishing separate, continuous

[6] 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 [2008], and Offerman [2002].
[7] 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.
[8] 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]).

measures for positive and for negative reciprocity inclinations and then associating these measures to labour market behaviour and life outcomes.[9]

Dohmen, et al. [2009, p. 592] state at the onset that "Reciprocity is an in-kind response to friendly or hostile acts." thus recognising that reciprocity is conditional behaviour rewarding kind acts or punishing unkind acts. Whether individuals have been exposed to an act which might prompt a reciprocity response, however, is, with one exception, set aside in their empirical analysis. In contrast, this paper focuses not on inclinations but whether kind or unkind acts at the workplace (fair/unfair wage) lead to a reciprocity response by the worker.

The one exception for Dohmen, et al. is their examination of the impact of reciprocity inclinations on the incidence of overtime first for a sample of workers who agreed that their current job income, which includes overtime earnings, is just (i.e., workers who are treated kindly) and then for a sample of workers who disagreed that their current income is just (i.e., workers who are treated unkindly) - see their Table 1, cols. (4) and (5). The authors interpret whether an individual worked overtime hours in the month preceding the interview as a measure of additional work effort. For those receiving an unjust income, reciprocity inclinations, whether positive or negative, have no statistically significant effect on the probability of working overtime. Thus, any effort response to an employer's unkind act of paying an unjust income is unrelated to the worker's negative reciprocity inclination.

For those receiving a just income, both positive and negative inclinations have statistically significant but opposing marginal effects on overtime. Positive reciprocity inclinations have a positive effect which is consistent with rewarding a kind act. The negative effect (p-value<0.05) for negative reciprocity inclinations, however, is not discussed

[9] An individual's inclination measures are based on strength of agreement to statements indicative of positive reciprocity (e.g., "*If* [italics mine] someone does me a favour, I am prepared to return it.") or of negative reciprocity (e.g., "*If* [italics mine] I suffer a serious wrong, I will take revenge as soon as possible, no matter what the cost.").

yet befuddling. For workers with negative reciprocity inclinations, their response to the kind act of receiving a just income, is a lower work effort/overtime incidence *ceteris paribus* and increasingly so with the magnitude of their negative reciprocity trait. Why workers with negative reciprocity inclinations do not respond to an unjust income yet respond adversely to a just income is perplexing.

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. [10]

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.

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

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.[11]

The fairness evaluation of the wage is left to the worker. Almost all reciprocity experiments define kind or unkind treatment/fair or unfair wage as simply a high or low wage relative to a specified or expected wage. Reciprocity, however, depends on the worker's perception of the wage. That perception or belief is inherently subjective and difficult to ascertain. As discussed in the Introduction, fairness rules are not easy to determine nor uniformly shared. Fortunately, the self-reported response to the statement above provides a direct measure of the worker's assessment of the wage.

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 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?

[11] 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.

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

$$
\begin{array}{lll}
y = -2 & \text{if} & y^* \leq \alpha_1 \\
y = -1 & \text{if} & \alpha_1 < y^* \leq \alpha_2 \\
y = 0 & \text{if} & \alpha_2 < y^* \leq \alpha_3 \\
y = +1 & \text{if} & \alpha_3 < y^* \leq \alpha_4 \\
y = +2 & \text{if} & y^* > \alpha_4
\end{array}
$$

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.[12] For consistency and simplicity, the same controls are relied on in the non-wage regressions. Regressions at the

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

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 right-hand side, indicator 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.

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 positive reciprocity, they would treat workers well not only in pay but in other dimensions of the employment relationship.

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.[13] 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." I test this conjecture first by examining the relationship between the wage fairness response to the worker's wage while also controlling for a wide range of wage determinants. I also capture the notion of "high wage," i.e., a wage greater than a worker's best alternative or the market-clearing wage, by using the residuals from a conventional wage regression. These residuals can be decomposed into a workplace and a worker component which allows a more detailed analysis of wage fairness and wage.

In examining wage fairness, I use the following wage regression

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

where $ln(wage_{ik})$ is the natural log of the wage rate for worker i in workplace k, $\boldsymbol{X_{ik}}$ is a set of employee characteristics, $\boldsymbol{Z_k}$ 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. He uses the same AWIRS 95 survey data as this study. The wage rate variable is constructed by dividing

[13] 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."

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.[14]

A large number of explanatory variables are used most of which are dummy variables. The vector $\boldsymbol{X_{ik}}$ is composed of human capital, demographic, and job characteristics of the worker while $\boldsymbol{Z_k}$ is composed of workplace measures of union presence and activity, workplace ownership and size, firm size, product market characteristics, and gender and shift work composition of the workforce.[15] Wage equation (1) is estimated separately by gender using fixed effects estimation for our workplace clustered sample.[16] For a wage fairness measure, I create *Get paid fairly* , an 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 *Get paid fairly* on $ln(wage_{ik})$ along with wage

[14] 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.

[15] In particular, $\boldsymbol{X_{ik}}$ 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 $\boldsymbol{Z_k}$ 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 $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$, 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.

[16] 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 $\boldsymbol{Z_k}$ can not be separately identified from the workplace fixed effect.

determinants $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$. Columns (1) and (4) in Table I report the results for male and for female employees, respectively. Clearly, a higher wage positively influences wage fairness and is highly statistically significant (*p*-value<.01).

I also regress *Get paid fairly* on the residuals $\hat{e}_{ik}$ from estimating wage equation (1) as well as on the workplace effect $\hat{c}_k$ and idiosyncratic error $\hat{u}_{ik}$ components of $\hat{e}_{ik}$ ($\equiv \hat{c}_k + \hat{u}_{ik}$) . Table I also reports these results. Note that the sampling variability with the generated regressors $\hat{e}_{ik}$, $\hat{c}_k$, and $\hat{u}_{ik}$ has not been accounted for in the standard errors listed in Table I which qualifies later discussion on statistical significance. The coefficients attached to $\hat{e}_{ik}$ match those for *ln(wage$_{ik}$)* which should be the case since by construction $\hat{e}_{ik}$ captures the residual wage after controlling for $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ and the coefficient attached to *ln(wage$_{ik}$)* captures the partial correlation of wage fairness to the wage after controlling for $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$. Of more interest are the regression results with the residual wage components $\hat{c}_k$ and $\hat{u}_{ik}$ whose coefficients are positive and strongly significant. Thus, employees at high wage workplaces (positive c_k) as well as those who receive high wage shocks at any workplace (positive u_{ik}) are more likely to perceive their wage as fair.[17]

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.

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

If one interprets 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 the wage fairness response.

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 while controlling for the wage. The results are reported in Table II. The explanatory variables of interest are the 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 $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ used in the earlier wage regressions are also used here which provide extensive controls for both the worker and

workplace. In addition, the wage paid to the worker is included as a regressor without which the estimated impact of *Fair wage* and *Unfair wage* might otherwise be contaminated by omitted variable bias linked to unaccounted for wage effects. Note, however, that the inclusion of wage determinants $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ already provides some control for these wage effects.

I find that, *ceteris paribus*, 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 that *Fair wage*, relative to *Unfair wage*, has a bigger impact on or stronger correlation with favourable employment relations. In contrast to the wage fairness measures, the wage control *ln(wage)* has no statistically significant effect.

The results of Tables I and II 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. Even after controlling for their wage, 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. 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 while controlling for the wage.

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. Wooden [2001, p. 1] states that 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.

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 in that situation is 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. I consider these schemes given 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 a 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.[18]

[18] The *award workplace* indicator variable is based on an 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

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[19], 2) performance-related payments are based at least partly on individual performance[20], 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 categories are designed to be mutually exclusive and exhaustive.[21] Table III provides details of the distribution of employees and workplaces in the survey sample across the different payment schemes.[22]

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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.

[19] 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.

[20] 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.

[21] 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.

[22] Before discussing the empirical results of reciprocity and payment arrangements, the reader may be interested in whether the distribution of fair wage responses differs 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 $\beta(\text{overaward}) > \beta(\text{award})$ 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

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 (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 ordered logit framework.

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

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

or

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

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. The variables $ln(wage_{ik})$, $\boldsymbol{X_{ik}}$, and $\boldsymbol{Z_k}$ are the same as those used in wage equation (1). Equation (2b) differs from (2a) by including controls for payment

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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.

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

$$y^*_k = \alpha + \delta_F \,\%\, fair_k + \delta_U \,\%\, unfair_k + \eta \; Gender\ weighted\ \hat{c}_k + \boldsymbol{Z_k'\gamma} + e_k \quad (3a)$$

or

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

except the worker index is dropped along with worker-specific variables $\boldsymbol{X_{ik}}$. 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.

The workplace-level regressions control for wages using the variable *Gender weighted* $\hat{c}_k$ which is linked to the wage measure $ln(wage_{ik})$ used in the worker-level regressions. Wage control *Gender weighted* $\hat{c}_k$ is the gender weighted, workplace fixed-effect estimated in the wage regressions described in Section IV. That is, the workplace fixed-effects from the separately estimated male and female wage regressions are averaged reflecting the gender

composition of the employee sample in workplace k . An alternative workplace wage measure is simply the log of the average wage for the workplace employee sample or $ln(\overline{wage})_k$ where $(\overline{wage})_k$ reflects the average of wages paid to those workers surveyed in workplace k .

I experiment with both measures although the reciprocity results reported below are robust to the choice of workplace wage measure as well as to not controlling for wages. The estimation results for (3a) and (3b) with *Gender weighted* $\hat{c}_k$ are reported in Tables VI, VII, and VIII. The Appendix also provides those same tables but without any wage control (see Tables A.VI(a), A.VII(a), and A.VIII(a)) or with $ln(\overline{wage})_k$ in place of *Gender weighted* $\hat{c}_k$ (see Tables A.VI(b), A.VII(b), and A.VIII(b)). Similarly for completeness, the Appendix provides estimation results for (2a) and (2b) but dropping the wage control *ln(wage)* (see Tables A.IV and A.V).

C. Reciprocity Estimates and Endogeneity Bias

The δ coefficients in equations (2) and (3) are proposed as means to detect reciprocity. Everything else being equal, these coefficients examine the impact of worker wage fairness perceptions on workplace performance. The fair wage parameter δ_F (δ_{F**}), if positive, would provide evidence of positive reciprocity while the unfair wage parameter δ_U (δ_{U**}), if negative, negative reciprocity. Given the discussion above about employer choice of payment schemes, reciprocity should be most evident with overaward compensation.

Equations (2) and (3) include wage controls along with the wage fairness measures. Hence, any reciprocity revealed by δ is targeted to fairness perception of the wage by the worker. As mentioned in the Introduction and in contrast to experimental reciprocity studies, wage fairness is defined here by the worker and is not assumed to be necessarily the same as a wage higher or lower than some expected wage. Excluding the wage control, possible omitted variable bias in δ might conflate fairness-reciprocity with non-reciprocity

implications tied to the omitted wage variable. On the other hand, by including the wage control and given the results in Table I discussed in Section IV.A., potential multicollinearity between the wage controls and the wage fairness variables could lead to large standard errors and insignificant regression coefficients for these variables individually. As alluded to earlier, however, dropping the wage controls does not, in general, materially alter the estimates and their standard errors for δ . Hence, multicollinearity does not seem to be a major problem here for statistical inference.

Endogeneity bias influencing the reciprocity estimates is, unfortunately, a concern.[23] The bias could arise in three different ways: 1. simultaneity or reverse causation, 2. omitted variable bias linked to omitted human resource management practice controls, and 3. selectivity bias given heterogeneous reciprocity preferences. For the first two, both concerns bias the estimates upward in magnitude leading them to overstate the true reciprocity impact.

Borrowing language from the program evaluation literature, the third source of bias stems from allowing the reciprocity response or "treatment effect" to vary across individuals due to differences in reciprocity preferences. Although preferences are unobserved to the researcher, they may be known in the workplace and will influence which workers will select or be selected to receive a fair or unfair wage "treatment" as well as whether an employer will choose such treatment for the workplace. Consequently, the mean or average treatment effect on the treated ("ATT") will not be the same as the effect of treatment on a randomly selected worker across the population, i.e., the average treatment effect ("ATE").

The δ coefficient estimates will provide unbiased estimates of the former or ATT, i.e., the average positive/negative reciprocity response for those workers who actually receive fair/unfair wages, but not so for the latter or ATE, i.e., the average reciprocity response if <u>all</u> workers were hypothetically paid fair or paid unfair wages. Fortunately, I can sign the bias

[23] Biased estimates discussed here should more accurately be referred to as asymptotically biased or inconsistent estimates. Even when ignoring possible endogeneity concerns, maximum likelihood estimation used for equations (2) and (3) may lead to consistent but, for finite samples, not necessarily unbiased estimates.

with δ overstating the positive reciprocity ATE for fair wages and understating the negative reciprocity ATE for unfair wages.

The ATE will be of primary interest if fair/unfair wages are exogenously imposed on employers and workers perhaps as social policy. In contrast, ATT will be of greater interest in quantifying the impact of fair/unfair wages in workplaces where such treatment naturally or endogenously emerges reflecting choices made by both sides of the labour market.

A detailed discussion of the three different sources of endogeneity bias follows.[24]

Simultaneity arises due to the interdependence of wages and productivity. In response to a fair wage, a worker reciprocates by raising productivity which is likely to push up wage rates.[25] As documented earlier in Section IV. A., fair wages are associated with high wages. Thus, the increase in wage rates will feed back into a greater likelihood of a perceived fair wage. Likewise, an unfair wage will lower productivity, push down wage rates, and feed back into wages being more likely perceived as unfair. Equations (2) and (3) examine the impact of wage fairness on worker performance but ignore how that performance may affect wages and thus wage fairness perceptions. Consequently, the estimated δ captures both the reciprocity impact and the impact of productivity on wages operating in the same direction and resulting in an overestimate of the true positive or negative reciprocity impact.

One way of eliminating the endogeneity of the wage fairness variables is to focus on the *award employee* or *award workplace* samples where wages are determined by a

[24] The usual endogeneity solution is to find credible instrumental variables which was attempted in this project but without success. Following Verhoogen, et al. [2005, Section 5], variables which capture local labour market conditions, i.e., the local outside wage and the local unemployment rate, were considered as possible instruments for the wage fairness measures. The maintained assumption is that local labour market conditions influence employee performance but only through their influence on wage fairness perceptions. In particular, higher outside wages and lower unemployment in local markets, which will lead to more attractive and available employment alternatives, will negatively influence the evaluation of the fairness of one's current wage. Unfortunately, when implemented with our data, both variables have a *positive* influence and the local outside wage is strongly significant. Given the wrong sign, they are rejected as valid or relevant instruments.

[25] Higher wages in response to higher worker effort has been observed in laboratory experiments. For example, in a repeated game of the labour market gift-exchange stage game with the same firm and worker player pair across repetitions, offered wages and worker effort both trend upward across repetitions (Gächter and Falk [2002], p. 17).

government tribunal at the industry or occupational level and exogenous to the workplace. Unfortunately, the *award* samples may be exempt from simultaneity bias but, as argued earlier, will not capture intentions-based reciprocity.

Omitted variables introduce a second source of bias and the omitted variable of interest concerns the human resource management strategy or system at the workplace. A firm's wage policy is simply one component of human resource management (HRM). The focus of this paper is whether wage fairness leads to reciprocity. One might expect, however, fair treatment of the worker involves not only the wage but other compensation as well as nonpecuniary aspects of the employment relationship. The empirical results in Section IV.B. support that expectation and establish that fair wages are positively correlated with kind treatment in non-monetary ways for workers in the AWIRS 95 data.

From the human resource literature, fair wages (i.e., efficiency wages, "premium compensation") are often found alongside other "high-commitment human resource management" practices (Baron and Kreps [1999], p. 190). The norm of reciprocity, in particular, positive reciprocity, is a factor not only in wage setting but also in enhancing the effectiveness of other high-commitment or high-performance work policies such as training, information sharing, and decentralized, team-based decision making (Pfeffer [2007], pp. 122-123). Perhaps not surprisingly, these work practices exhibit complementarities so that firms generally choose not one but a bundle of such practices (Baron and Kreps [1999], p. 190).

Keying on or controlling for one such component (fair wage in my case) while omitting controls for other complementary but unobserved practices will overstate the impact of the observed practice. Evaluating their empirical evidence, Ichniowski, et al. [1997, pp. 311] find that "the apparent positive [productivity] effects of individual practices in models without controls for HRM systems are biased [upward] by the omission of other HRM practices with which the one included practice is correlated." Thus, omitted variables for

HRM policies will lead our estimates of δ_F to exaggerate the true positive reciprocity impact.[26] Omission of the same variables should not influence estimates of δ_U since high-commitment work practices would not be bundled together with paying unfair wages.

The third source of bias considers heterogeneity in worker reciprocity which influences whether a worker will face a fair or unfair wage. The impact or effect of a fair/unfair wage treatment may differ across workers due to differences in worker social preferences. While these preferences are unobserved to the researcher, they may be known by the worker and/or employer. Selection into treatment may emerge in two ways.

Firstly, whether an employer will choose to offer fair or unfair wages at the workplace will depend on the employer's knowledge of the distribution of reciprocity preferences for available workers. Other things equal, an employer who believes that a ready supply of reciprocators are available is more likely to offer a fair wage while for a ready supply of non-reciprocators, an unfair wage. Secondly, conditional on the wage treatment offered, which workers will be hired or will offer their labour services will depend on their reciprocity preferences.

To provide structure to this discussion and ignoring the other sources of endogeneity bias, consider the following random coefficient representation of worker reciprocity:

$$y_i = \boldsymbol{x_i}' \boldsymbol{\beta} + \delta_i T_i + u_i \qquad (4)$$

where y_i is some measure of effort or productivity for worker i, $\boldsymbol{x_i}$ is a vector of different covariates, T_i is an indicator variable of whether i faces the Fair Wage (Unfair Wage) treatment T, and δ_i captures the i's positive (negative) reciprocity response to the treatment.[27] Assume error term u_i has a zero conditional mean $E(u_i \mid \boldsymbol{x_i}, T_i) = 0$. Notice that the treatment response or effect is not the same across workers but is allowed to vary

[26] Alternatively, if *Fair wage* may be viewed as a proxy for high-performance HRM policies, then δ_F measures the total effect of the entire package rather than just the marginal effect of the fair wage component.
[27] The random coefficient setup here linked to treatment evaluation is influenced by the discussion in Heckman and Robb [1985, Sec. 1.4 and 3.7].

capturing heterogeneous reciprocity preferences. To simplify the discussion, (4) has stripped away some of the features of (2) and (3) by focusing only on one treatment T and by assuming the unit of observation is individual and y to be a continuous rather than an ordered multinomial variable. Given these simplifications, the presentation below is only suggestive of the likely direction of the endogeneity bias for the later estimates rather than a formal derivation.

Define $E(\delta_i) \equiv \bar{\delta}$ and $\varepsilon_i \equiv \delta_i - \bar{\delta}$. Thus, $E(\varepsilon_i) = 0$. Assume $\{ \boldsymbol{x_i}, u_i, \varepsilon_i \}$ is an independent sequence with respect to i and, to streamline later notation, ε_i is mean independent of $\boldsymbol{x_i}$ conditional on T_i, i.e., $E(\varepsilon_i \mid \boldsymbol{x_i}, T_i) = E(\varepsilon_i \mid T_i)$. In equation (4), replace δ_i with $\bar{\delta} + \varepsilon_i$ and add and subtract $T_i \, E(\varepsilon_i \mid T_i = 1)$ to yield

$$y_i = \boldsymbol{x_i}'\boldsymbol{\beta} + \delta^* T_i + \{ u_i + T_i [\varepsilon_i - E(\varepsilon_i \mid T_i = 1)] \} \quad (5)$$

$$\text{where } \delta^* = \bar{\delta} + E(\varepsilon_i \mid T_i = 1) .$$

Regressing y_i on $\boldsymbol{x_i}$ and T_i will identify δ^* which captures the average treatment effect on workers receiving the wage treatment (ATT) but not $\bar{\delta}$ ($\equiv E(\delta_i)$) which is the expected reciprocity treatment response for a randomly drawn individual i, i.e., the average treatment effect (ATE). Notice that the ATT is the same as the ATE, i.e., $\delta^* = \bar{\delta}$, if and only if $E(\varepsilon_i \mid T_i = 1) = 0$. This zero conditional mean indicates ε_i does not influence who is selected for treatment, i.e., no mean selection bias. This situation would be the case where workers and employers do not know or do not act on ε_i which, *a priori*, seems implausible.

Even if an employer may not know ε_i for any worker i, information regarding the distribution of ε_i will influence whether the employer will choose to offer fair/unfair wage treatment at the workplace. For example, if the distribution of reciprocity preferences is compressed with mean zero ($\bar{\delta} = 0$), then there is little productivity benefit of offering fair wages. On the other hand, if $\bar{\delta} \gg 0$, then the potential productivity gains are large which increases the attractiveness of fair wage treatment.

Even though the ATE is not, in general, identified, the identified ATT may provide a lower bound or upper bound to the ATE depending upon the nature of selection into treatment with regards to the worker's reciprocity preferences. Selection on this basis will determine the sign of $E(\varepsilon_i \mid T_i = 1)$. *Homo reciprocans*, relative to *homo economicus*, is favoured but avoided in the case of unfair wages. In particular, for fair wage treatment T_i, I would expect that employers would more likely select for treatment workers with stronger or above average reciprocity preferences (i.e., $\delta_i > \bar{\delta}$ and $\varepsilon_i > 0$) who would provide larger productivity benefits. Furthermore, those workers would also more likely seek to participate in such treatment. Hence, $E(\varepsilon_i \mid T_i = 1) > 0$. For positive reciprocity, $\delta_F^* > \bar{\delta}_F$ (> 0) and the ATT provides an upper bound for the ATE.

In contrast, for unfair wage treatment, selection does not favour *homo reciprocans* workers and so the ATT provides a lower bound in magnitude for the ATE. Note that negative reciprocity is captured by a negative productivity response $\delta_i < 0$ to unfair wage treatment T_i. Employers are more likely to select workers with weaker or below average reciprocity preferences (i.e., $|\delta_i| < |\bar{\delta}|$ and ε_i $(= \delta_i - \bar{\delta}) > 0$) to lessen the negative productivity consequences. Such workers would also be less averse to participate in such treatment and, once again, $E(\varepsilon_i \mid T_i = 1) > 0$. However, for negative reciprocity, $|\delta_U^*| < |\bar{\delta}_U|$ and the ATT is smaller in size than the ATE.

In summary, if workers differ in their responses to fair or unfair wage treatment and those differences influence selection for treatment in the workplace, then the δ parameters will capture the ATT but overstate ATE for positive reciprocity and understate the magnitude of the ATE for negative reciprocity. The asymmetry stems from selection bias where workers with stronger reciprocity preferences are overrepresented among those selected for fair treatment but underrepresented for unfair treatment.

Experimental reciprocity studies yield estimates of the ATE since selection into treatment is not a consideration. In such studies where the assignment to control and treatment groups is randomized across experimental participants (e.g., Gneezy and List [2006]) or where each participant is alternately exposed to control and treatment (e.g., Cohn et al. [2013]), selectivity bias is not relevant. Given the participant sample, workers may not select into or out of treatment and the ATT is no different from the ATE.

Using survey data of actual workplaces where reciprocity treatment is endogenously determined, I can identify the ATT via δ^* but not the ATE . While the ATT bounds the ATE given our ability to sign the selection bias, the ATT is of interest in its own right and probably of greater interest from a managerial perspective. Unlike the ATE which provides insight if fair wage treatment is exogenously imposed on all workplaces and workers perhaps as social policy, the estimated ATT for my survey data estimates the impact of such treatment where workplaces and workers have elected to offer or receive such treatment and not some alternative. I expect that managers who have chosen fair wage or unfair wage treatments do so in circumstances which are favourable to elicit the positive reciprocity benefits or to lessen the negative reciprocity consequences, respectively. Circumstances conducive for, say, unfair wage treatment would be where managers are reasonably able to monitor and enforce worker effort and available workers do not have strong reciprocity preferences. For any prospective manager, the ATT gives some guidance of the treatment effects for situations appropriate for such treatment.

Considering jointly the three different sources of endogeneity bias (simultaneity; omitted variables for high-performance human resource management policies; selection and heterogeneous reciprocity preferences), all three imply that the estimate of positive reciprocity $\hat{\delta}_F$ will be biased upward from the true δ_F or ATE. The conclusion for negative reciprocity is more nuanced or conditional. The estimate $\hat{\delta}_U$ could be biased upward or

downward in magnitude from the true δ_U or ATE depending on whether simultaneity or selection bias, respectively, dominates. If selection based on heterogeneous social preferences across workers is the only concern, however, both $\hat{\delta}_F$ and $\hat{\delta}_U$ provide unbiased estimates of the ATT for workers treated with fair or unfair wages, respectively.

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

I begin examining reciprocity by asking whether wage fairness influences worker effort. To do so, I use the self-reported responses (variable *Job effort*) to the following AWIRS 95 survey question restricted to those who have autonomy or discretion in how or in how hard they perform their job.[28]

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.[29] 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

[28] 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.

[29] 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.

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 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 serious concerns over the objective accuracy of this self-reported effort measure.

Examining the estimation results for equations (2a) and (2b), evidence of reciprocity in worker effort is sparse and inconsistent. The empirical results for male and for female employees are found on Tables IV and V, respectively. Examining the male results first, support for reciprocity is tenuous or contradictory. Without controlling for pay scheme but with controls for worker and workplace characteristics (see Table IV, col. 2), *Fair wage* has a positive δ_F coefficient which is supportive of positive reciprocity but is only weakly statistically significant (p-value<.096). In contrast, the coefficient δ_U for *Unfair wage* has an unexpected positive sign which is incompatible with negative reciprocity and has stronger

statistical significance (*p*-value<.035). The support for positive reciprocity is notable but quantifying the impact of *Fair wage* on *Job effort* is postponed to later in this section.

Column 4 in Table IV 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 significant (*p*-value<.065). 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 V 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 V, <u>all</u> 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 explain this 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 wrongly reports 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.[30]

Putting aside this caution, however, I return to examining how big of a positive reciprocity impact does *Fair wage* have on male *Job effort* found in Table IV, col. 2. I examine the average partial effect of going from receiving neither a fair nor unfair wage (*Fair wage* = 0 and *Unfair wage* = 0) to receiving a fair wage (*Fair wage* = 1 and *Unfair wage* = 0) on the predicted probabilities for *Job effort* outcomes.[31] I average over the partial effect for each observation in the estimation sample for this discrete change. Each observation maintains its own values for the control variables except for *Fair wage* and *Unfair wage*. The results are given below.

Average Partial Effect on the Predicted Probabilities for Male *Job effort*

Responses to Statement "I put a lot of effort into my job"

	Agree	Neither agree nor disagree	Disagree

[30] The earlier caution was based on an anomalous result of low effort associated with higher wages. This reoccurs in Table IV where *ln(wage)* has a negative and statistically significant partial correlation with *Job effort* for males (see col. (2) and (4) in Table IV).

[31] One might also wish to examine the average partial effect of going from receiving an unfair wage (*Fair wage* = 0 and *Unfair wage* = 1) to receiving a fair wage (*Fair wage* = 1 and *Unfair wage* = 0). However, given the estimates from Table IV, col. 2, with $\hat{\delta}_F$ = 0.243 being smaller than $\hat{\delta}_U$ = 0.339 , the latent variable for *Job effort* will be smaller and positive reciprocity is automatically ruled out. It should be noted, though, that the difference between $\hat{\delta}_F$ and $\hat{\delta}_U$ is not statistically significant.

Avg Predicted Probabilities with	0.908***	0.076***	0.016***
Fair wage = 1, *Unfair wage* = 0	(0.007)	(0.006)	(0.002)
Avg Predicted Probabilities with	0.887***	0.093***	0.020***
Fair wage = 0, *Unfair wage* = 0	(0.012)	(0.010)	(0.003)
Difference in	0.021	-0.017	-0.004
Average Predicted Probabilities	(0.013)	(0.010)	(0.003)

Note: 1. Robust standard errors in parentheses.

2. *, **, *** indicate significance at the ten, five, and one percent levels, respectively.

Interpreting the difference numbers in the last row, receiving a fair wage will raise by 2.1% the probability of agreeing while lowering by 1.7% and 0.4% the probability of neither agreeing nor disagreeing or of disagreeing, respectively, with the *Job effort* statement. None of these differences, however, are statistically significant and their magnitudes are small. The lack of statistical significance is not surprising given that the estimate for δ_F is only marginally significant (*p*-value=.096). I conclude that the evidence for positive reciprocity with male *Job effort* is, at best, weak and, combined with the earlier concern over the self-reported worker effort variable, not to be relied on.

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

Reciprocity by workers might be revealed not just 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

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 statistically significant evidence of positive reciprocity (see Table VI, 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 $\delta_{F^{**}}$ to be positive and for $\delta_{U^{**}}$ to be negative which are the correct signs for positive and negative reciprocity, respectively (see Table VI, col. (4)). The only statistically significant coefficients are for δ_{FOv} (p-value<0.040) 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. The results in Table VI relying on the manager's evaluation of labour relations are not out of line with the results in Table II discussed earlier that wage fairness influences workers' evaluation of their workplace and management. These newer manager results, however, do not exhibit the same clarity or uniformity in terms of correct sign and strong statistical significance of the earlier worker results.

Nevertheless, the negative and statistically significant coefficient -1.006 for *% unfair* with p-value<0.005 in Table VI, col. (2) provides solid evidence of negative reciprocity. I turn next to examining the magnitude of the effect or how important is negative reciprocity on *Labour relations*. I do so by examining the "fully standardized" impact of *% unfair* on the

latent *Labour relations* variable as well as the average marginal effect of a change in *% unfair* on the predicted probabilities for the different *Labour relations* categorical outcomes.

To provide a frame of reference, I compare the fully standardized impact and average marginal effect to those for another control variable used in the Table VI, col. (2) regression, i.e., the proportion of workplace employees who are female. I choose this variable (*proportion female*), which has a coefficient of 0.754 with a standard error of 0.281 (*p*-value<0.007), partly because it is one of the few continuous (i.e., non-indicator) variables in Z_k which has a strong statistically significant effect. In addition, the *proportion female* has demographic and economic interest in its own right. Empirical results from the discrimination literature suggest that gender composition has an impact on plant-level productivity (Hellerstein et al. [1999]) and profitability (Hellerstein et al. [2002]).

In the ordered logit framework described in Sec. III.C., the observed *Labour relations* or y variable is determined by the value of an unobserved latent variable y^*. The fully standardized coefficient for an independent variable x on y^* is simply $\beta_x (\sigma_x/\sigma_{y^*})$ where β_x is the normal regression coefficient and σ indicates standard deviation. The estimated fully standardized coefficients for *% unfair* and *proportion female* are -0.109 and 0.104 , respectively, which may be interpreted as a one standard deviation change in *% unfair* (*proportion female*) is expected to change the latent variable y^* by -0.109 (0.104) standard deviations. Given the variability in *% unfair* and *proportion female* , their impacts on the latent *Labour relations* variable are practically identical in magnitude.

Impacts on the latent variable do not readily translate into the impacts on the observed survey responses. I now present the effect of a marginal change in *% unfair* and *proportion female* on the predicted probabilities for the different possible outcomes of *Labour relations*. I average over the marginal effects for each observation in the Table VI, col. (2) estimation

sample, where each observation has its own values for the control variables, to give the average marginal effect. The results are listed below.

Average Marginal Effect on the Predicted Probabilities for *Labour Relations* Outcome

	Very Good	Good	Neither good nor poor	Poor	Very Poor
% unfair	-0.203***	0.112***	0.070***	0.019**	0.003*
	(0.072)	(0.040)	(0.026)	(0.007)	(0.002)
female proportion	0.152***	-0.084***	-0.053***	-0.014**	-0.002
	(0.056)	(0.031)	(0.020)	(0.006)	(0.001)

Note: 1. Robust standard errors in parentheses.

2. *, **, *** indicate significance at the ten, five, and one percent levels, respectively.

The numbers in the table above indicate the X% point change in the average predicted probability of the *Labour relations* outcome due to, at the margin, either a 1% point increase in the proportion of workplace employees who disagree that they are paid fairly *(% unfair*) or a 1% point increase in the proportion of workplace employees who are female (*proportion female*). For example, a 1% point increase in *% unfair* results in a -0.203% point change in the average predicted probability change in "Very Good" labour relations.

Looking across each row, the average marginal effects are biggest in size for the first two categories "Very Good" and "Good" which are also the two most frequent responses by managers in evaluating relations at their workplace. The impact on the predicted probabilities does not seem trivial given the small 1% point change in the two control variables. Comparing the numbers down each column, the negative reciprocity effect of *% unfair* is uniformly bigger than the impact of *proportion female* on *Labour relations* from the

perspective of average marginal effects on predicted probabilities. If gender composition is of concern in workplace relations, then so should the payment of unfair wages.

My examination of reciprocity and Labour relations has so far ignored possible endogeneity bias with our estimates reported in Table VI. As discussed earlier, with regards to positive reciprocity, $\hat{\delta}_F$ will be biased upward from the true δ_F or average treatment effect (ATE). Hence, assuming our estimated standard error remained the same, the failure to detect statistical significance for my biased $\hat{\delta}_F$ would still hold even if the bias is removed. The earlier conclusion of little or no evidence for positive reciprocity remains the same even after considering the possible bias in $\hat{\delta}_F$.

The endogeneity implications for negative reciprocity are more involved. The above examination of the magnitude or importance of the negative reciprocity effect on *Labour relations* uses $\hat{\delta}_U$ = -1.006 . If simultaneity is the primary source of endogeneity bias, then $|\hat{\delta}_U| > |\delta_U|$ and the above examination overstates both the magnitude and, assuming no change in the estimated standard error, the statistical significance of the effect. On the other hand, if reciprocity preferences are heterogeneous and selection is the chief concern, then $\hat{\delta}_U$ underestimates the ATE if unfair wages were hypothetically applied to <u>all</u> workers but does provide an unbiased estimate of the average treatment effect on the treated (ATT) for workers in the AWIRD 95 survey who actually reported unfair wages. Note that for negative reciprocity, this unbiased, estimated ATT does provide a lower bound for the ATE.

F. 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

If the workplace is not commercial (i.e., profit seeking), the respondent is 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 the cognitive bias of "illusory superiority" by management.

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 provides a degree of separation and hopefully 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 statistically significant support for reciprocity (see Table VII, cols. (1) and (2)). While the coefficients δ_U at least have the correct negative sign consistent with negative reciprocity, the coefficients δ_F are also negative which is inconsistent with positive reciprocity. 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 VII, 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 pertains to reciprocity with *Overaward* payments. The estimates for δ_{FOv} and for δ_{UOv} are both positive but statistically insignificant. The lack of statistical significance, even with *Overaward* payments which were expected to offer the best case for detecting reciprocity, suggests that reciprocity in *Labour productivity* is not apparent.

The preceding section documents that paying unfair wages will worsen workplace relations. However, the results in this section indicate that any negative impact on labour-management relations does not lead to lower workplace productivity. The negative reciprocity in labour relations has no detectable productivity consequences.

G. Do Fair Wages Raise Profitability?

So far, the evidence of reciprocity at the workplace in response to wage fairness is not overwhelming. Without controls for pay scheme, statistically significant evidence for negative reciprocity can be found in *Labour relations* but no evidence of positive reciprocity whether in *Labour relations* or in *Labour productivity*. The addition of pay scheme controls and focusing on the favoured case of *Overaward* payments provides only evidence of positive reciprocity in *Labour relations*. 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 pay off for the employer? Are they profitable?

To address these issues, I use the 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?

"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 VIII displays the econometric results from the ordered logit regressions. Without controls for pay scheme but controlling for workplace characteristics (see Table VIII, col. (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/fair wages leading to higher profits although a negative δ_U is supportive of negative reciprocity/unfair wages lowering profits. Adding controls for pay scheme and focusing on *Overaward* workplaces provides similar negative signs and the same lack of statistical significance (see Table VIII col. (4)); no stronger evidence of reciprocity is found.

Given the statistically insignificant profitability results, 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 positively related to the wage. 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 relationship between these indicators and wage fairness perceptions is probed while controlling for the wage. By doing so, the fairness-reciprocity response is isolated from any possible, confounding, non-reciprocity impact of the wage on the indicators.

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 little evidence in support of positive reciprocity. Some evidence suggests that males are more likely to put greater effort in their job relative to males who feel that their pay is neither fair nor unfair. However, after quantifying the impact, the impact is small and not statistically significant. Similarly, managers of workplaces with a greater proportion of fair wage workers do not report better labour relations, labour productivity, nor profitability. In contrast, evidence in favour of negative reciprocity is found. Paying unfair wages has a negative and highly statistically significant impact on workplace relations. Negative reciprocity, though, does not impinge on workplace productivity nor profitability.

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. Except in the case of positive reciprocity with *Labour relations*, reciprocity is not more apparent under overawards, a setting conducive to revealing reciprocity, than other pay schemes.

Overall using a large sample of Australian workers and workplaces, I find no strong widespread evidence of positive reciprocity. Negative reciprocity is evident in labour-management relations but that does not extend to workplace productivity nor profitability.

Factoring in possible endogeneity bias – whether due to simultaneity, to omitted human resource management controls, or to selectivity given heterogeneous reciprocity preferences for workers – does not alter the conclusion for positive reciprocity. Endogeneity bias from the three possible sources will lead the point estimates capturing positive reciprocity to be biased upward. Failure to reject no positive reciprocity (i.e., H_0: $\delta_F = 0$) for an upwardly biased point estimate $\hat{\delta}_F$ would also occur for the lower, unbiased estimate assuming the same estimated standard error.

Implications for or interpretations of the negative reciprocity estimates depend on the source of endogeneity. For negative reciprocity, the relevant sources concern simultaneity and selectivity which introduce bias in opposing directions with the former biasing upward and the latter downward the magnitude of the estimated negative reciprocity response. If simultaneity is the primary concern, then my evidence of negative reciprocity in workplace relations may overstate the size of the impact. If reciprocity preferences vary across workers and selectivity is the primary endogeneity concern, then my negative reciprocity estimates provide a lower bound for the "average treatment effect" of unfair wages if, hypothetically, they are randomly assigned across both workplaces and workers. Perhaps more useful for managers contemplating offering unfair wages, my estimates provide an unbiased estimate of

the "average treatment effect on the treated", i.e., the negative reciprocity impact experienced by managers that have chosen, as their best option given the alternatives, to pay unfair wages.

Moving away from endogeneity concerns and as mentioned earlier, the consensus from economic and psychology experiments is that negative stimuli produce a stronger behavioural response than positive stimuli although both have import. The asymmetry in my results is starker. Negative reciprocity is detected in workplace relations but little or little widespread evidence confirms the presence of positive reciprocity at the workplace whether in labour-management relations or other dimensions considered in this paper.

The virtual absence of positive reciprocity, however, is not unique to this study regarding labour market behaviour. Several field experiments fail to detect no or no persistent greater worker effort in response to kind treatment with a wage higher than promised (Gneezy and List [2006]), presumed (Kube, Maréchal, and Puppe [2006]), or previously paid (Hennig-Schmidt, Rockenbach, and Sadrieh [2010]). Similarly, in an interview study examining wage rigidity and unemployment, Bewley [1999] concludes that only a morale theory linked to fairness and reciprocity receives some support and considers as relevant only the negative consequences of wage setting on worker morale. He writes,

> The level of pay itself has little impact on morale, unless pay is so low as to be perceived as grossly unfair . . . . Workers soon get used to pay that is high relative to the market and grow to believe they have a right to it. Only pay cuts or inadequate raises affect morale, and do so negatively. (Bewley [1999], p. 432)

My contrasting evidence of negative and positive reciprocity may also be interpreted as consistent with Akerlof and Yellen's [1990] fair wage-effort hypothesis. According to their hypothesis, worker effort only moves with the wage when the wage is unfair which is what I pick up as negative reciprocity. If the wage is not unfair (in the context of my survey data, workers who do not "disagree" that they are paid fairly but instead respond either with "agree" or "neither agree nor disagree" that they are paid fairly), effort is constant and I fail

to detect positively reciprocity to any wage change. Reciprocity is only a consideration when wages are unfair.

References

Agell, Jonas and Lundborg, Per, "Theories of Pay and Unemployment: Survey Evidence from Swedish Manufacturing Firms," *Scandinavian Journal of Economics*, 97:2 (1995), pp. 295-307.

Akerlof, George A., "Labor Contracts as Partial Gift Exchange," *Quarterly Journal of Economics*, 97:4 (November 1982), pp. 543-569.

Akerlof, George A., and Dickens, William T., "The Economic Consequences of Cognitive Dissonance," *American Economic Review*, 72:3 (June 1982), pp. 307-19.

Akerlof, George A., and Yellen, Janet L., "The Fair Wage-Effort Hypothesis and Unemployment," *Quarterly Journal of Economics*, 105:2 (May 1990), pp. 255-283.

Al-Ubaydli, Omar, Gneezy, Uri, Lee, Min Sok, and List, John A., "Towards an Understanding of the Relative Strengths of Positive and Negative Reciprocity," *Judgment and Decision Making*, 5:7 (December 2010), pp. 524-539.

Baron, James N., and Kreps, David M., Strategic Human Resources: Frameworks for General Managers, New York: John Wiley & Sons, Inc., 1999.

Bewley, Truman, Why Wages Don't Fall in a Recession, Cambridge: Harvard University Press, 1999.

Blount, Sally, "When Social Outcomes aren't Fair: The Effect of Causal Attributions on Preferences," *Organizational Behavior and Human Decision Processes*, 63 (August 1995), pp. 131-44.

Charness, Gary "Attribution and Reciprocity in an Experimental Labor Market," *Journal of Labor Economics*, 22:3 (July 2004), pp. 665-88.

Cohn, Alain, Fehr, Ernst, and Goette, Lorenz, "Fair Wages and Effort Provision: Combining Evidence from the Lab and the Field," Department of Economics, University of Zurich, Working Paper No. 107, January 2013.

Deci, Edward, and Ryan, Richard, Intrinsic Motivation and Self-Determination in Human Behavior, New York: Plenum Press, 1985.

Dohmen, Thomas, Falk, Armin, Huffman, David, and Sunde, Uwe, "Homo Reciprocans: Survey Evidence on Behavioural Outcomes," *Economic Journal*, 119:536 (March 2009), pp. 592-612.

Falk, Armin, Fehr, Ernst, and Fischbacher, Urs, "Testing Theories of Fairness – Intentions Matter" *Games and Economic Behavior*, 62 (2008), pp. 287-303.

Falk, Armin and Fischbacher, Urs, "The Economics of Reciprocity: Evidence and Theory," in Richard B. Freeman (ed.), Inequality Around the World, New York: Palgrave Macmillan in association with the International Economic Association, 2002, pp. 207-233.

Fehr, Ernst and Falk, Armin, "Why Labour Market Experiments?" *Labour Economics*, 10 (2003), pp. 399-406.

Fehr, Ernst and Gächter, Simon, "Fairness and Retaliation: The Economics of Reciprocity," *Journal of Economic Perspectives*, 14:3 (Summer 2000), pp. 159-181.

Fehr, Ernst and Gächter, Simon, "Do Incentive Contracts Undermine Voluntary Cooperation?" Institute for Empirical Research in Economics, University of Zurich, Working Paper No. 34, April 2002.

Fehr, Ernst, Gächter, Simon, and Kirchsteiger, Georg, "Reciprocity as a Contract Enforcement Device: Experimental Evidence," *Econometrica*, 65:4 (July 1997), pp. 833-860.

Fehr, Ernst, Goette, Lorenz, and Zehnder, Christian, "A Behavioral Account of the Labor Market: The Role of Fairness Concerns," *Annual Review of Economics*, 1 (2009), pp. 355-84.

Fehr, Ernst and Schmidt, Klaus., "Theories of Fairness and Reciprocity – Evidence and Economic Applications," Institute for Empirical Research in Economics, University of Zurich, Working Paper No. 75, February 2001.

Gächter, Simon and Falk, Armin, "Reputation and Reciprocity: Consequences for the Labour Relation," *Scandinavian Journal of Economics*, 104:1 (2002), pp. 1-26.

Gneezy, Uri, and List, John, "Putting Behavioral Economics to Work: Testing for Gift Exchange in Labor Markets Using Field Experiments," *Econometrica*, 74:5 (September 2006), pp. 1365-1384.

Gneezy, Uri, and Rustichini, Aldo, "A Fine is a Price," *Journal of Legal Studies*, 29:1 Part 1 (January 2000), pp. 1-18.

Heckman, James J. and Robb, Jr., Richard, "Alternative Methods for Evaluating the Impact of Interventions," in James J. Heckman and Burton Singer (eds.), Longitudinal Analysis of Labor Market Data, Cambridge: Cambridge University Press, 1985, Chapter 4, pp. 156-245.

Hellerstein, Judith K., Neumark, David, and Troske, Kenneth R., "Wages, Productivity, and Worker Characteristics: Evidence from Plant-Level Production Functions and Wage Equations," *Journal of Labor Economics*, 17:3 (July 1999), pp. 409-446.

Hellerstein, Judith K., Neumark, David, and Troske, Kenneth R., "Market Forces and Sex Discrimination," *Journal of Human Resources*, 37:2 (Spring 2002), pp. 353-380.

Hennig-Schmidt, Heike, Rockenbach, Bettina, and Sadrieh, Abdolkarim, "In Search of Workers' Real Effort Reciprocity – A Field and a Laboratory Experiment," *Journal of European Economic Association*, 8:4 (June 2010), pp. 817-837.

Ichniowski, Casey, Shaw, Kathryn, and Prennushi, Giovanna, "The Effects of Human Resource Management Practices on Productivity: A Study of Steel Finishing Lines," *American Economic Review*, 87:3 (June 1997), pp. 291-313.

Kahneman, Daniel, Knetsch, Jack L., and Thaler, Richard, "Fairness as a Constraint on Profit Seeking: Entitlements in the Market," *American Economic Review*, 76:4 (September 1986a), pp. 728-741.

Kahneman, Daniel, Knetsch, Jack L., and Thaler, Richard, "Fairness and the Assumptions of Economics," *Journal of Business*, 59:4 (October 1986b), pp. S285-S300.

Kube, Sebastian, Maréchal, Michel André, and Puppe, Clemens, "Putting Reciprocity to Work –Positive versus Negative Responses in the Field," Department of Economics, University of St. Gallen, Discussion Paper No. 2006-27, November 2006.

List, John, "Social Preferences: Some Thoughts from the Field," *Annual Review of Economics*, 1 (2009), pp. 563-579.

Offerman, Theo, "Hurting Hurts More than Helping Helps," *European Economic Review*, 46:8 (September 2002), pp. 1423-37.

Pfeffer, Jeffrey, "Human Resources from an Organizational Behavior Perspective: Some Paradoxes Explained," *Journal of Economic Perspectives*, 21:4 (Fall 2007), pp. 115-134.

Stratton, Leslie S., "Why Does More Housework Lower Women's Wages? Testing Hypotheses Involving Job Effort and Hours Flexibility," *Social Science Quarterly*, 82:1 (March 2001), pp. 67-76.

Verhoogen, Eric A., Burks, Stephen V., and Carpenter, Jeffrey P., "Fairness and Freight-Handlers: Local Labor Market Conditions and Wage-Fairness Perceptions in a Trucking Firm," manuscript, March 2005.

Wooden, Mark, *The Transformation of Australian Industrial Relations*, Sydney: Federation Press, 2000.

Wooden, Mark, "Union Wage Effects in the Presence of Enterprise Bargaining," *Economic Record*, 77:236 (March 2001), pp. 1-18.

TABLE I: Wage Fairness, the Wage, and Wage Residuals

Dependent variable: *Get paid fairly*

Explanatory Variables	Male Employees			Female Employees		
of Interest	(1)	(2)	(3)	(4)	(5)	(6)
$ln(wage_{ik})$	0.996*** (0.106)	____	____	0.751*** (0.106)	____	____
$\hat{e}_{ik}$ ($\equiv \hat{c}_k + \hat{u}_{ik}$)	____	0.996*** (0.106)	____	____	0.751*** (0.106)	____
$\hat{c}_k$	____	____	1.114*** (0.197)	____	____	1.082*** (0.202)
$\hat{u}_{ik}$	____	____	0.928*** (0.103)	____	____	0.626*** (0.105)
Number of employees	7139	7139	7139	5491	5491	5491

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Wage residuals are drawn from fixed effects estimation of wage equation (1) estimated separately by gender.
5. Other controls include variables $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ used in the wage regressions described in Section IV.

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

Explanatory Variables of Interest	Male Employees				Female Employees			
	Dependent Variables							
	Satisfied with job (1)	Good place to work (2)	How management treats workers (3)	Management gets on with employees (4)	Satisfied with job (5)	Good place to work (6)	How management treats workers (7)	Management gets on with employees (8)
Fair wage	1.004***	0.950***	0.683***	0.638***	0.926***	0.932***	0.663***	0.490***
	(0.064)	(0.065)	(0.060)	(0.061)	(0.078)	(0.074)	(0.068)	(0.070)
Unfair wage	-0.577***	-0.376***	-0.646***	-0.439***	-0.620***	-0.374***	-0.464***	-0.414***
	(0.062)	(0.064)	(0.062)	(0.065)	(0.075)	(0.076)	(0.071)	(0.076)
ln(wage)	0.035	-0.033	-0.069	-0.057	0.040	-0.115	0.025	-0.037
	(0.076)	(0.073)	(0.073)	(0.067)	(0.085)	(0.087)	(0.076)	(0.080)
Log-likelihood	-5857.0	-6169.6	-6882.5	-6523.7	-4205.9	-4540.2	-5279.0	-4792.0
Model test: $\chi^2(79)$	1201.3***	846.9***	1162.0***	911.7***	668.5***	633.8***	689.4***	504.2***
No. of employees	7046	7004	6956	7015	5402	5392	5334	5372

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
3. Other controls include variables $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ used in the wage regressions described in Section IV.

TABLE III: 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 IV and V.

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

TABLE IV: Job Effort and Wage Fairness – Males

Dependent variable: *Job effort*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
Fair wage	0.191 (0.124)	0.243* (0.146)	____	____
Unfair wage	0.214* (0.129)	0.339** (0.161)	____	____
ln(wage)	0.100 (0.096)	-0.330** (0.139)	0.100 (0.096)	-0.332** (0.141)
OverawardEE	____	____	-0.040 (0.419)	0.224 (0.481)
Explicit IncentivesEE	____	____	0.714 (0.737)	1.545 (1.032)
OtherEE	____	____	0.144 (0.265)	0.319 (0.303)
Fair wage • *OverawardEE*	____	____	0.297 (0.362)	0.363 (0.360)
Fair wage • *Explicit IncentivesEE*	____	____	-0.224 (0.632)	-0.769 (1.130)
Fair wage • *AwardEE*	____	____	0.243 (0.287)	0.492 (0.355)
Fair wage • *OtherEE*	____	____	0.160 (0.148)	0.205 (0.171)
Unfair wage • *OverawardEE*	____	____	0.116 (0.485)	0.209 (0.653)
Unfair wage • *Explicit IncentivesEE*	____	____	-1.087 (0.886)	-2.273* (1.231)
Unfair wage • *AwardEE*	____	____	0.326 (0.296)	0.473 (0.365)
Unfair wage • *OtherEE*	____	____	0.216 (0.151)	0.385** (0.187)
Controls ***X*** and ***Z***	No	Yes	No	Yes

Log-likelihood	-1863.4	-1288.8	-1861.7	-1284.6
Model test	$\chi^2(3) = 4.85$	$\chi^2(78) = 189.40$***	$\chi^2(12) = 8.42$	$\chi^2(87) = 213.78$***
Number of employees	5329	3884	5329	3884

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
5. Control variables $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ are the same as those used in the wage regressions described in Section IV.

TABLE V: Job Effort and Wage Fairness - Females

Dependent variable: *Job effort*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
Fair wage	0.303*	0.126	____	____
	(0.160)	(0.208)		
Unfair wage	0.443**	0.285	____	____
	(0.191)	(0.244)		
ln(wage)	0.293**	0.110	0.286**	0.130
	(0.145)	(0.263)	(0.145)	(0.264)
OverawardEE	____	____	0.212	-0.172
			(0.513)	(0.655)
Explicit IncentivesEE	____	____	-0.053	0.792
			(0.650)	(1.074)
OtherEE	____	____	0.612**	0.686*
			(0.279)	(0.382)
Fair wage • *OverawardEE*	____	____	0.356	0.926
			(0.543)	(0.616)
Fair wage • *Explicit IncentivesEE*	____	____	1.320	0.222
			(0.985)	(1.275)
Fair wage • *AwardEE*	____	____	0.610**	0.138
			(0.271)	(0.363)
Fair wage • *OtherEE*	____	____	0.094	0.032
			(0.213)	(0.267)
Unfair wage • *OverawardEE*	____	____	†	‡
Unfair wage • *Explicit IncentivesEE*	____	____	0.411	-0.046
			(0.922)	(1.477)
Unfair wage • *AwardEE*	____	____	1.011***	0.686
			(0.355)	(0.466)
Unfair wage • *OtherEE*	____	____	0.088	0.002
			(0.247)	(0.309)
Controls ***X*** and ***Z***	No	Yes	No	Yes

Log-likelihood	-1060.2	-678.8	-1053.2	-671.9
Model test	$\chi^2(3)$ = 9.83**	$\chi^2(77)$ = 142.18***	$\chi^2(11)$ = 18.75*	$\chi^2(85)$ = 152.73***
Number of employees	4283	2951	4230	2909

† Perfect prediction problem discussed in Sec. II.C. encountered. All 53 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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
5. Control variables $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ are the same as those used in the wage regressions described in Section IV.

TABLE VI: Workplace Labour Relations and Wage Fairness

Dependent variable: *Labour relations*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	0.014 (0.283)	-0.026 (0.316)	____	____
% unfair	-1.151*** (0.297)	-1.006*** (0.357)	____	____
Gender weighted $\hat{c}_k$	-0.769*** (0.219)	-0.147 (0.259)	-0.716*** (0.238)	-0.183 (0.265)
OverawardWP	____	____	-0.169 (0.625)	-0.331 (0.647)
Explicit IncentivesWP	____	____	1.417 (1.489)	1.122 (1.500)
OtherWP	____	____	0.950** (0.461)	1.155** (0.501)
% fair • OverawardWP	____	____	1.191* (0.634)	1.410** (0.688)
% fair • Explicit IncentivesWP	____	____	0.066 (1.840)	0.581 (1.907)
% fair • AwardWP	____	____	0.911* (0.470)	0.702 (0.508)
% fair • OtherWP	____	____	-0.435 (0.379)	-0.368 (0.414)
% unfair • OverawardWP	____	____	-0.583 (0.928)	-0.879 (0.958)
% unfair • Explicit IncentivesWP	____	____	-3.006 (2.287)	-2.310 (2.330)
% unfair • AwardWP	____	____	0.059 (0.491)	0.254 (0.559)
% unfair • OtherWP	____	____	-1.556*** (0.405)	-1.353*** (0.458)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-1807.4	-1446.2	-1657.7	-1429.5
Model test	$\chi^2(3)$ = 37.19***	$\chi^2(43)$ = 246.61***	$\chi^2(12)$ = 44.95***	$\chi^2(52)$ = 255.71***
Number of workplaces	1816	1555	1664	1539

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Wage control *Gender weighted* $\hat{c}_k$ is the gender weighted, workplace fixed-effect estimated in the wage regressions described in Section IV. That is, the workplace fixed-effects from the separately estimated male and female wage regressions are averaged reflecting the gender composition of the employee sample in workplace k . Control variables $\boldsymbol{Z_k}$ same as those used in the wage regressions described in Section IV.

TABLE VII: Workplace Labour Productivity and Wage Fairness

Dependent variable: *Labour productivity*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.062 (0.291)	-0.162 (0.321)	____	____
% unfair	-0.467 (0.300)	-0.482 (0.345)	____	____
Gender weighted $\hat{c}_k$	-0.067 (0.233)	0.225 (0.269)	-0.029 (0.255)	0.281 (0.278)
OverawardWP	____	____	-0.272 (0.674)	-0.397 (0.684)
Explicit IncentivesWP	____	____	0.345 (1.382)	0.480 (1.311)
OtherWP	____	____	-0.100 (0.524)	-0.061 (0.534)
% fair • OverawardWP	____	____	0.201 (0.616)	0.142 (0.628)
% fair • Explicit IncentivesWP	____	____	-0.661 (1.619)	-0.698 (1.553)
% fair • AwardWP	____	____	0.054 (0.583)	-0.153 (0.584)
% fair • OtherWP	____	____	-0.079 (0.372)	-0.180 (0.388)
% unfair • OverawardWP	____	____	0.270 (1.142)	0.455 (1.164)
% unfair • Explicit IncentivesWP	____	____	-0.964 (1.929)	-1.122 (2.011)
% unfair • AwardWP	____	____	-0.658 (0.574)	-0.582 (0.582)
% unfair • OtherWP	____	____	-0.361 (0.373)	-0.480 (0.406)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-2205.8	-1896.8	-2028.2	-1879.2
Model test	$\chi^2(3)$ = 4.58	$\chi^2(28)$ = 50.41***	$\chi^2(12)$ = 6.12	$\chi^2(37)$ = 51.52*
Number of workplaces	1651	1423	1514	1408

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Wage control *Gender weighted* $\hat{c}_k$ is the gender weighted, workplace fixed-effect estimated in the wage regressions described in Section IV. That is, the workplace fixed-effects from the separately estimated male and female wage regressions are averaged reflecting the gender composition of the employee sample in workplace k . Control variables $\boldsymbol{Z_k}$ 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 VIII: Workplace Profitability and Wage Fairness

Dependent variable: *Profitability*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.596 (0.454)	-0.182 (0.497)	____	____
% unfair	-0.536 (0.490)	-0.502 (0.546)	____	____
Gender weighted $\hat{c}_k$	0.087 (0.338)	0.223 (0.421)	-0.312 (0.379)	0.078 (0.441)
OverawardWP	____	____	1.094 (0.875)	1.432 (0.919)
Explicit IncentivesWP	____	____	-0.031 (2.312)	0.360 (2.317)
OtherWP	____	____	0.001 (0.749)	0.336 (0.789)
% fair • OverawardWP	____	____	-1.080 (0.832)	-0.907 (0.933)
% fair • Explicit IncentivesWP	____	____	-0.172 (2.264)	0.741 (2.463)
% fair • AwardWP	____	____	-0.751 (0.752)	-0.670 (0.761)
% fair • OtherWP	____	____	0.155 (0.633)	0.363 (0.696)
% unfair • OverawardWP	____	____	-1.507 (1.469)	-1.380 (1.599)
% unfair • Explicit IncentivesWP	____	____	6.220 (5.761)	4.457 (4.438)
% unfair • AwardWP	____	____	-0.462 (0.794)	0.030 (0.846)
% unfair • OtherWP	____	____	-0.411 (0.658)	-0.461 (0.723)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-848.9	-714.2	-776.5	-694.0
Model test	$\chi^2(3) = 1.80$	$\chi^2(42) = 79.18$***	$\chi^2(12) = 19.48$*	$\chi^2(51) = 101.00$***
Number of workplaces	1151	1023	1070	1015

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Wage control *Gender weighted* $\hat{c}_k$ is the gender weighted, workplace fixed-effect estimated in the wage regressions described in Section IV. That is, the workplace fixed-effects from the separately estimated male and female wage regressions are averaged reflecting the gender composition of the employee sample in workplace k . Control variables $\boldsymbol{Z_k}$ 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.

APPENDIX

Additional Tables

The numbering of tables in this appendix conform to their counterparts in the main part of the paper prefixed by “A.” .

TABLE A.IV: Job Effort and Wage Fairness – Males

(same as Table IV but without wage control *ln(wage)*)

Dependent variable: *Job effort*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
Fair wage	0.211*	0.201	____	____
	(0.122)	(0.143)		
Unfair wage	0.212	0.338**	____	____
	(0.129)	(0.161)		
OverawardEE	____	____	-0.017	0.193
			(0.419)	(0.480)
Explicit IncentivesEE	____	____	0.724	1.583
			(0.732)	(1.023)
OtherEE	____	____	0.155	0.321
			(0.265)	(0.304)
Fair wage • *OverawardEE*	____	____	0.310	0.346
			(0.361)	(0.359)
Fair wage • *Explicit IncentivesEE*	____	____	-0.200	-0.838
			(0.629)	(1.115)
Fair wage • *AwardEE*	____	____	0.258	0.463
			(0.287)	(0.355)
Fair wage • *OtherEE*	____	____	0.179	0.162
			(0.146)	(0.168)
Unfair wage • *OverawardEE*	____	____	0.107	0.230
			(0.483)	(0.659)
Unfair wage • *Explicit IncentivesEE*	____	____	-1.087	-2.276*
			(0.880)	(1.224)
Unfair wage • *AwardEE*	____	____	0.331	0.473
			(0.296)	(0.366)
Unfair wage • *OtherEE*	____	____	0.212	0.384**
			(0.151)	(0.186)
Controls ***X*** and ***Z***	No	Yes	No	Yes

Log-likelihood	-1863.9	-1291.0	-1862.1	-1286.7
Model test	$\chi^2(2)$ = 3.59	$\chi^2(77)$ = 184.04***	$\chi^2(11)$ = 7.18	$\chi^2(86)$ = 208.60***
Number of employees	5329	3884	5329	3884

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
5. Control variables $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ are the same as those used in the wage regressions described in Section IV.

TABLE A.V: Job Effort and Wage Fairness – Females

(same as Table V but without wage control *ln(wage)*)

Dependent variable: *Job effort*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
Fair wage	0.328**	0.134	____	____
	(0.160)	(0.208)		
Unfair wage	0.445**	0.281	____	____
	(0.191)	(0.243)		
OverawardEE	____	____	0.268	-0.178
			(0.512)	(0.654)
Explicit IncentivesEE	____	____	-0.043	0.772
			(0.653)	(1.071)
OtherEE	____	____	0.616**	0.669*
			(0.280)	(0.384)
Fair wage • *OverawardEE*	____	____	0.374	0.937
			(0.542)	(0.614)
Fair wage • *Explicit IncentivesEE*	____	____	1.326	0.230
			(0.989)	(1.275)
Fair wage • *AwardEE*	____	____	0.619**	0.135
			(0.272)	(0.364)
Fair wage • *OtherEE*	____	____	0.125	0.045
			(0.213)	(0.268)
Unfair wage • *OverawardEE*	____	____	†	‡
Unfair wage • *Explicit IncentivesEE*	____	____	0.398	-0.045
			(0.926)	(1.476)
Unfair wage • *AwardEE*	____	____	1.019***	0.670
			(0.356)	(0.465)
Unfair wage • *OtherEE*	____	____	0.090	0.001
			(0.247)	(0.309)
Controls ***X*** and ***Z***	No	Yes	No	Yes

Log-likelihood	-1062.1	-678.9	-1055.0	-672.0
Model test	$\chi^2(2)$ = 6.15**	$\chi^2(76)$ = 142.23***	$\chi^2(10)$ = 15.24	$\chi^2(84)$ = 153.03***
Number of employees	4283	2951	4230	2909

† Perfect prediction problem discussed in Sec. II.C. encountered. All 53 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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
5. Control variables $\boldsymbol{X_{ik}}$ and $\boldsymbol{Z_k}$ are the same as those used in the wage regressions described in Section IV.

TABLE A.VI(a): Workplace Labour Relations and Wage Fairness

(same as Table VI but without wage control *Gender weighted* $\hat{c}_k$)

Dependent variable: *Labour relations*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.150 (0.282)	-0.050 (0.312)	____	____
% unfair	-1.151*** (0.298)	-1.000*** (0.357)	____	____
OverawardWP	____	____	-0.320 (0.610)	-0.362 (0.642)
Explicit IncentivesWP	____	____	1.442 (1.501)	1.136 (1.494)
OtherWP	____	____	0.917** (0.464)	1.158** (0.501)
% fair • OverawardWP	____	____	1.099* (0.614)	1.401** (0.685)
% fair • Explicit IncentivesWP	____	____	-0.172 (1.871)	0.533 (1.901)
% fair • AwardWP	____	____	0.853* (0.473)	0.684 (0.506)
% fair • OtherWP	____	____	-0.612 (0.377)	-0.408 (0.408)
% unfair • OverawardWP	____	____	-0.410 (0.912)	-0.839 (0.955)
% unfair • Explicit IncentivesWP	____	____	-3.129 (2.273)	-2.311 (2.313)
% unfair • AwardWP	____	____	-0.002 (0.490)	0.252 (0.558)
% unfair • OtherWP	____	____	-1.527*** (0.408)	-1.351*** (0.459)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-1814.1	-1446.4	-1662.8	-1429.8
Model test	$\chi^2(2)$ = 24.77***	$\chi^2(42)$ = 247.16***	$\chi^2(11)$ = 34.69***	$\chi^2(51)$ = 256.19***
Number of workplaces	1816	1555	1664	1539

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Control variables $\boldsymbol{Z_k}$ same as those used in the wage regressions described in Section IV.

TABLE A.VI(b): Workplace Labour Relations and Wage Fairness

(same as Table VI but with $ln(\overline{wage})$ as the wage control)

Dependent variable: *Labour relations*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	0.091 (0.284)	0.068 (0.315)	____	____
% unfair	-1.052*** (0.299)	-1.000*** (0.356)	____	____
$ln(\overline{wage})$	-0.819*** (0.147)	-0.492** (0.197)	-0.858*** (0.159)	-0.551*** (0.206)
OverawardWP	____	____	-0.017 (0.633)	-0.216 (0.664)
Explicit IncentivesWP	____	____	1.563 (1.551)	1.147 (1.534)
OtherWP	____	____	1.134** (0.464)	1.239** (0.503)
% fair • OverawardWP	____	____	1.287** (0.647)	1.452** (0.710)
% fair • Explicit IncentivesWP	____	____	0.180 (1.879)	0.727 (1.924)
% fair • AwardWP	____	____	1.008** (0.469)	0.807 (0.512)
% fair • OtherWP	____	____	-0.430 (0.382)	-0.324 (0.413)
% unfair • OverawardWP	____	____	-0.583 (0.948)	-0.978 (0.975)
% unfair • Explicit IncentivesWP	____	____	-3.186 (2.393)	-2.426 (2.418)
% unfair • AwardWP	____	____	0.358 (0.497)	0.344 (0.562)
% unfair • OtherWP	____	____	-1.605*** (0.409)	-1.407*** (0.459)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-1805.4	-1448.8	-1652.6	-1430.6
Model test	$\chi^2(3)$ = 53.40***	$\chi^2(43)$ = 247.04***	$\chi^2(12)$ = 65.06***	$\chi^2(52)$ = 256.91***
Number of workplaces	1823	1560	1669	1543

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Wage control $ln(\overline{wage})$ is the log of the average wage for the workplace employee sample. Control variables $\boldsymbol{Z_k}$ same as those used in the wage regressions described in Section IV.

TABLE A.VII(a): Workplace Labour Productivity and Wage Fairness

(same as Table VII but without wage control *Gender weighted* $\hat{c}_k$)

Dependent variable: *Labour productivity*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.076 (0.288)	-0.127 (0.319)	____	____
% unfair	-0.467 (0.300)	-0.492 (0.345)	____	____
OverawardWP	____	____	-0.279 (0.668)	-0.335 (0.679)
Explicit IncentivesWP	____	____	0.345 (1.380)	0.499 (1.326)
OtherWP	____	____	-0.102 (0.523)	-0.031 (0.533)
% fair • OverawardWP	____	____	0.198 (0.617)	0.168 (0.629)
% fair • Explicit IncentivesWP	____	____	-0.671 (1.615)	-0.648 (1.557)
% fair • AwardWP	____	____	0.051 (0.582)	-0.117 (0.581)
% fair • OtherWP	____	____	-0.085 (0.369)	-0.140 (0.389)
% unfair • OverawardWP	____	____	0.278 (1.137)	0.381 (1.158)
% unfair • Explicit IncentivesWP	____	____	-0.966 (1.926)	-1.143 (2.041)
% unfair • AwardWP	____	____	-0.661 (0.573)	-0.561 (0.581)
% unfair • OtherWP	____	____	-0.358 (0.373)	-0.506 (0.407)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-2205.9	-1897.2	-2028.2	-1879.8
Model test	$\chi^2(2) = 4.43$	$\chi^2(27) = 49.52$***	$\chi^2(11) = 6.07$	$\chi^2(36) = 50.25$*
Number of workplaces	1651	1423	1514	1408

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Control variables $\boldsymbol{Z_k}$ 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 A.VII(b): Workplace Labour Productivity and Wage Fairness

(same as Table VII but with $ln(\overline{wage})$ as the wage control)

Dependent variable: *Labour productivity*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.059 (0.286)	-0.113 (0.317)	____	____
% unfair	-0.470 (0.298)	-0.508 (0.344)	____	____
$ln(\overline{wage})$	-0.125 (0.144)	-0.018 (0.179)	-0.119 (0.157)	0.003 (0.186)
OverawardWP	____	____	-0.227 (0.671)	-0.322 (0.686)
Explicit IncentivesWP	____	____	0.362 (1.395)	0.511 (1.326)
OtherWP	____	____	-0.065 (0.522)	-0.021 (0.535)
% fair • OverawardWP	____	____	0.212 (0.613)	0.163 (0.626)
% fair • Explicit IncentivesWP	____	____	-0.617 (1.627)	-0.653 (1.557)
% fair • AwardWP	____	____	0.091 (0.579)	-0.039 (0.586)
% fair • OtherWP	____	____	-0.068 (0.367)	-0.137 (0.385)
% unfair • OverawardWP	____	____	0.244 (1.139)	0.367 (1.162)
% unfair • Explicit IncentivesWP	____	____	-0.980 (1.961)	-1.134 (2.042)
% unfair • AwardWP	____	____	-0.633 (0.569)	-0.606 (0.579)
% unfair • OtherWP	____	____	-0.377 (0.373)	-0.502 (0.407)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-2213.2	-1903.3	-2033.5	-1884.8
Model test	$\chi^2(3)$ = 5.30	$\chi^2(28)$ = 49.21***	$\chi^2(12)$ = 7.18	$\chi^2(37)$ = 49.87*
Number of workplaces	1658	1428	1519	1412

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Wage control $ln(\overline{wage})$ is the log of the average wage for the workplace employee sample. Control variables $\boldsymbol{Z_k}$ 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 A.VIII(a): Workplace Profitability and Wage Fairness

(same as Table VIII but without wage control *Gender weighted* $\hat{c}_k$)

Dependent variable: *Profitability*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.579 (0.453)	-0.152 (0.496)	____	____
% unfair	-0.539 (0.490)	-0.518 (0.544)	____	____
OverawardWP	____	____	1.017 (0.862)	1.447 (0.914)
Explicit IncentivesWP	____	____	-0.111 (2.346)	0.365 (2.316)
OtherWP	____	____	-0.015 (0.738)	0.334 (0.790)
% fair • OverawardWP	____	____	-1.095 (0.834)	-0.911 (0.930)
% fair • Explicit IncentivesWP	____	____	-0.164 (2.286)	0.740 (2.464)
% fair • AwardWP	____	____	-0.771 (0.736)	-0.666 (0.763)
% fair • OtherWP	____	____	0.075 (0.624)	0.379 (0.687)
% unfair • OverawardWP	____	____	-1.419 (1.475)	-1.403 (1.593)
% unfair • Explicit IncentivesWP	____	____	6.352 (5.957)	4.437 (4.422)
% unfair • AwardWP	____	____	-0.470 (0.783)	0.029 (0.847)
% unfair • OtherWP	____	____	-0.388 (0.657)	-0.465 (0.722)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-848.9	-714.3	-776.9	-694.0
Model test	$\chi^2(2)$ = 1.68	$\chi^2(41)$ = 78.27***	$\chi^2(11)$ = 18.77*	$\chi^2(50)$ = 100.51***
Number of workplaces	1151	1023	1070	1015

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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Control variables $\boldsymbol{Z_k}$ 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.

TABLE A.VIII(b): Workplace Profitability and Wage Fairness

(same as Table VIII but with $ln(\overline{wage})$ as the wage control)

Dependent variable: *Profitability*

Explanatory Variables	Without Pay Scheme		With Pay Scheme	
	(1)	(2)	(3)	(4)
% fair	-0.602 (0.454)	-0.221 (0.501)	____	____
% unfair	-0.536 (0.489)	-0.510 (0.547)	____	____
$ln(\overline{wage})$	0.101 (0.209)	0.315 (0.301)	-0.146 (0.234)	0.223 (0.312)
OverawardWP	____	____	1.102 (0.878)	1.348 (0.923)
Explicit IncentivesWP	____	____	0.008 (2.318)	0.279 (2.345)
OtherWP	____	____	0.073 (0.749)	0.335 (0.782)
% fair • OverawardWP	____	____	-1.078 (0.834)	-0.867 (0.939)
% fair • Explicit IncentivesWP	____	____	-0.194 (2.265)	0.795 (2.473)
% fair • AwardWP	____	____	-0.691 (0.747)	-0.607 (0.743)
% fair • OtherWP	____	____	0.053 (0.633)	0.266 (0.696)
% unfair • OverawardWP	____	____	-1.456 (1.473)	-1.291 (1.607)
% unfair • Explicit IncentivesWP	____	____	6.210 (5.796)	4.548 (4.553)
% unfair • AwardWP	____	____	-0.439 (0.796)	-0.021 (0.839)
% unfair • OtherWP	____	____	-0.417 (0.659)	-0.446 (0.725)
Controls ***Z***	No	Yes	No	Yes

Log-likelihood	-851.5	-717.2	-779.4	-697.9
Model test	$\chi^2(3)$ = 1.91	$\chi^2(42)$ = 77.53***	$\chi^2(12)$ = 18.45	$\chi^2(51)$ = 96.92***
Number of workplaces	1155	1027	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 10%, 5% and 1% levels, respectively. Robust standard errors are shown in parentheses.
4. Wage control $ln(\overline{wage})$ is the log of the average wage for the workplace employee sample. Control variables $\boldsymbol{Z_k}$ 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.