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**Article**

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## GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

# Domains of reciprocity beyond monetary compensation: How do non-pecuniary factors affect effort and shirking?

Akinori Tomohara<sup>1\*</sup> and Akihiko Ohno<sup>1</sup>

**Abstract:** This empirical study examines how sources of reciprocity are related to work motivation by distinguishing positive and negative work attitudes in practical working environments. We move away from the unidimensional perspective of monetary compensation and investigate employees' reciprocal behaviors, together with non-pecuniary aspects of work relations such as human relationships and company management. The results show that positive reciprocity, represented by effort, is fundamentally distinct from negative reciprocity, represented by shirking, when examining the multi-dimensional sources of reciprocity. Additionally, our analyses reveal that non-pecuniary factors in the working environment have a relatively large degree of association with work motivation, even when compared to monetary compensation. Our results complement those from controlled laboratory experiments.

**Subjects:** Asian Studies; Human Resource Management; Labour Economics

**Keywords:** equity; inequity aversion; reciprocity; work motivation

**JEL Classifications:** J0; J16; J5

### ABOUT THE AUTHORS

Akinori Tomohara received his PhD in Economics from Johns Hopkins University. Upon finishing his PhD, Tomohara served as a faculty member at the City University of New York (Graduate Center and Queens College) and the University of Pittsburgh. He has also worked as an economist at the University of California, Los Angeles Anderson Forecast. His research interests include the human resource management of multinational companies.

Akihiko Ohno, PhD, is a professor at Aoyama Gakuin University. His research interest is economic development in Asia, where he has conducted various researches in villages and factories. Ohno has continued with his research while traveling around areas left behind in economic development. His major subjects include organizational behaviors of factory workers in Asia.

We utilize our expertise to analyze how human resource management strategies of multinational companies help to develop the labor force in less developed countries through improved work motivation.

### PUBLIC INTEREST STATEMENT

This study examines how factors beyond monetary compensation are related to work motivation using a survey conducted in several Asian countries. Specifically, our empirical analysis distinguishes work attitudes of two types, namely effort and shirking, because the factors that motivate each type could be different. Our analysis shows that human relationships have the strongest relationship with extra effort, but company management is the most important factor related to shirking. Additionally, equity is not related to extra effort, but inequity is related to increased shirking. Our analyses reveal that non-pecuniary factors, such as human relationships and company management, in the working environment have a relatively large degree of association with work motivation, even when compared to monetary compensation.

## 1. Introduction

Employee motivation has remained a chief concern of economists ever since the division of labor became a common working practice after the Industrial Revolution. Good human resource management can improve employee work attitudes and elicit high company performance in terms of productivity, profitability, and a return to shareholders (Appelbaum, Bailey, Berg, & Kalleberg, 2000; Becker & Huselid, 1998; Cascio, 2006; Huselid, 1995; Huselid, Jackson, & Schuler, 1997; Pfeffer, 1998; Pfeffer & Veiga, 1999; Shaw, 2006).

The efficiency wage theory is an influential approach among the numerous studies on work motivation (Akerlof, 1982; Akerlof & Yellen, 1990; Shapiro & Stiglitz, 1984). There is a positive relationship between wages and work motivation (i.e. a higher wage motivates employees to work hard), but there are a few possible explanations for this relationship. The incentive mechanism of Akerlof's gift exchange model differs from those of the shirking model of Shapiro and Stiglitz. In the gift exchange model, employees are willing to work hard to express their appreciation of the generosity of their employers, who offer a higher wage than the market-clearing wage.

Recent studies show a growing interest in reciprocity in the choice of effort (Charness, 2004; Cohn, Fehr, & Goette, 2014; Falk, Fehr, & Fischbacher, 2008; Falk & Fischbacher, 2006; Fehr & Gächter, 2000; Fehr, Gächter, & Kirchsteiger, 1997). Reciprocity is defined as "an in-kind response to beneficial or harmful acts ... even if no material gains can be expected" (Fehr & Gächter, 2000, p. 160). Employees may adjust their work attitudes, either by working hard or by shirking, depending on how they feel about the work environment provided by their employers.

This empirical study examines the manner in which and the degree to which reciprocity affects work motivation. Previously, the relevance of reciprocity has been explored mainly through experimental laboratory games. Favorable behavior of the principal in the laboratory usually means paying a higher wage and, occasionally, paying in a fair way. Our analyses are distinct from these previous works because, using individual-specific data, we move away from this unidimensional perspective (i.e. the effects of monetary compensation). Thus, we investigate whether employees' reciprocal behaviors are related to other types of treatment (or aspects of work relations), such as their relationships with supervisors, together with monetary compensation. Here, we address the theme that people are concerned with both pecuniary and non-pecuniary factors (i.e. multi-dimensional sources of reciprocity).

The analytical method is intended to serve as a complement to controlled laboratory experiments, because the literature recognizes strict assumptions, including experimental designs that are far from realistic, as limitations of laboratory experiments (Charness, Frechette, & Kagel, 2004; Fehr & Gächter, 2000; Pereira, Silva, & Silva, 2006). Although laboratory experiments have been elaborated on in order to represent situations more realistically, some problems remain. The duration of tasks is one such problem. Field experiments conducted by Gneezy and List (2006) yielded results that differ from those obtained in laboratory experiments, where experimental employment relationships last only for several hours. Therefore, it is questionable whether the results of laboratory experiments can be generalized to the real world (Levitt & List, 2007; Stoop, Noussair, & van Soest, 2012). Our analyses have an advantage over laboratory experiments because we use survey data, which elicit aspects of work relations that are difficult to study in a laboratory.

Additionally, while many laboratory experiments have examined positive reciprocity in work motivation, we also assess negative reciprocity. We distinguish between two types of work attitudes: effort and shirking. Effort corresponds to rewards by taking on extra tasks; shirking corresponds to punishment via an aversion to work. Effort is costly for employees. Shirking is not only a way of reducing the cost, but also has an aspect of punishment, because employees could be punished via penalties such as reduced wages, demotion, or being fired. The literature refers to shirking as negative reciprocity (Agell, 2004; Dohmen, Falk, Huffman, & Sunde, 2009). Considering the possible asymmetric nature of the two work attitudes, we examine whether the determinants of reciprocity vary

between effort and shirking, in practice, when applied to the non-pecuniary and pecuniary factors of human resource management. We also examine the degree to which (un)favorable treatment affects reciprocity, because works such as Fehr and Gächter (2000) and Offerman (2002) show that people tend to punish harmful behavior more strongly than rewarding friendly behavior.

Our analyses use survey data collected from employees at foreign plants in Malaysia, China, Thailand, Singapore, and Indonesia who work for 57 Japanese multinational companies in the manufacturing industry. These multinational companies have been developing sophisticated human resource management strategies that are suitable for each region, after considering both pecuniary and non-pecuniary factors. The survey includes questions on work-related perceptions that represent subjective evaluations of the human resource management of their companies. Other questions investigate work attitudes (effort and shirking) and demographic characteristics. The information on employees' conceptions of work is helpful when specifying non-pecuniary-related conditions under which productivity improvement is expected via enhanced work motivation. In this sense, the data are relevant for our project, which examines the mechanism through which companies motivate employees to work hard or discourage employees from working hard.

This study is partly motivated to examine the success of Japanese multinational companies operating in Asia. After trial and error, these companies developed human resource management systems suitable for the area. Although job creation is often pointed out as one of the merits of hosting foreign direct investment, our analyses show that labor quality improvement is another merit. This is because our results show how the human resource management of multinational companies contributes to economic development in less developed countries by improving labor quality.

We examine how reciprocity affects work motivation after incorporating an analysis of subjective qualitative data into weighted ordered probit models. Four factors with regard to work-related perceptions represent sources of reciprocity in the choice of work attitudes: equity, job satisfaction, company management, and human relationships, after a factor analysis. Then, the analyses show that positive and negative reciprocity are fundamentally distinct in terms of the multi-dimensional sources of reciprocity. The relative importance of factors varies between effort and shirking. An examination of the marginal effects reveals that human relationships have the strongest relationship with effort, followed by job satisfaction. On the other hand, company management and equity are strongly related to shirking, although equity is not related to effort. Additionally, the effect on shirking tends to be stronger than the effect on effort. Furthermore, we do not observe a strong negative correlation between effort and shirking. Those who are willing to exert an extra effort are not necessarily the people who are less likely to shirk. These asymmetric relations also imply fundamental differences between positive and negative reciprocity. Effort and shirking are not simply two sides of the same coin. In addition to fundamental differences between positive and negative reciprocity, our analyses show that non-pecuniary factors such as human relationships and company management have a relatively large degree of association with work motivation, even when compared to monetary compensation.

The remainder of this paper is organized as follows. Section 2 describes the data used in our analyses and introduces the model. Then, the results of the analyses are discussed in Section 3. Section 4 concludes the paper.

## 2. Data and model

Our analyses assess survey data collected from local employees working for foreign plants of 57 Japanese multinational companies in the manufacturing industry between 2005 and 2007. The areas include Malaysia, China, Thailand, Singapore, and Indonesia. Among the Japanese multinational companies operating in these areas, these are the companies that have local plants with local employees and that agreed to cooperate with a survey. The census survey was administered using a placement method, with a self-administered questionnaire. With regard to privacy, the process guaranteed anonymity by explicitly informing respondents that individual responses would be used

only for research, and would not be revealed to their supervisors or companies. The survey includes questions related to work attitudes, subjective evaluations of the companies' human resource management (i.e. work-related perceptions), and demographic characteristics. These questions were prepared by relating concepts on work motivation from economics literature to those of industrial psychology (Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001; Eisenberger, Huntington, Hutchison, & Sowa, 1986; Mowday, Porter, & Steer, 1982). Table 1 presents the questions used for the analyses.

Table 2 presents the data used for our analyses. From the sample of 50,193 employees, we received 40,327 responses about work attitudes questions. There are more women (60%) than men (40%) in our sample. With regard to marital status, nearly half the respondents are single; the remainder are married. Divorced or widowed respondents accounted for only about 2% of the sample. About half the respondents had attained at least a high school education. Additionally, observations from Thailand account for nearly 40% of the sample.

We use weighted ordered probit models to examine the determinants of work attitudes  $W$ . The term  $W$  is applied to work attitudes of two types: effort and shirking. Work attitudes are assumed to

**Table 1. Survey questions used for analyses**

1.	Effort
	I try to work more than assigned*
2.	Shirking
	I sometimes avoid working*
3.	Equity
	The company evaluates me fairly based on my performance*
	The evaluation standards of human resource management are fair*
	My work is evaluated properly*
4.	Promotion is conducted fairly*
	Job satisfaction
	I am satisfied with the social evaluation of my work**
	I am satisfied with the social evaluation of the company**
	I am satisfied with the number of holidays and working hours**
5.	I am satisfied with the welfare system of the company/factory**
	Company management
	The management shows respect to workers*
	The management cares about workers' welfare*
6.	The management appreciates workers' hard work*
	Human relationships
	I am satisfied with the relationship with my supervisor**
	I am satisfied with the relationship with my colleagues and subordinates**
7.	I am satisfied with the human relationships at my workplace**
	Pecuniary factors
	The level of my wage is fair***

Note: The factors "equity," "job satisfaction," "company management," and "human relationships" were ex post labels determined after the factor analysis, but were not pre-determined when preparing the questionnaire.

\*Multiple choice answers are (1) I don't think (or feel) so; (2) I somewhat don't think (or feel) so; (3) Cannot say; (4) I somewhat think (or feel) so; (5) I think (or feel) so.

\*\*Multiple choice answers are (1) Dissatisfied; (2) Somewhat dissatisfied; (3) Cannot say; (4) Somewhat satisfied; (5) Satisfied.

\*\*\*Multiple choice answers are (1) Unfair; (2) Somewhat unfair; (3) Cannot say; (4) Somewhat fair; (5) Fair.

**Table 2. Summary statistics**

		Male	Female			
Gender		41.6	58.4			
		Single	Married	Other		
Marital status		48.7	49.2	2.2		
		Junior high school	High school	Vocational school	University	
Education		17.8	32.6	29.8	19.8	
		Malaysia	Singapore	Indonesia	China	Thailand
Areas		25.6	0.4	0.6	30.0	43.0
		Mean	SD			
Age		28.8	7.0			
		1	2	3	4	5
1 Effort						
	Work more	12.9	8.9	21.0	26.7	30.5
2 Shirking						
	Avoid working	24.8	13.6	20.2	18.4	23.0
3 Equity						
	Performance	19.2	20.5	24.2	20.8	15.2
	Evaluation standards	22.6	20.0	25.9	19.1	12.3
	Work evaluation	19.1	19.1	28.1	21.2	12.5
	Promotion	27.4	17.7	27.6	15.5	11.8
4 Job satisfaction						
	Work	6.7	8.9	39.7	29.4	15.2
	Company	6.0	7.8	35.1	33.1	18.1
	Holidays/working hours	14.9	14.0	19.2	29.0	22.9
	Welfare system	19.3	17.9	20.3	27.5	15.0
5 Company management						
	Respect	15.1	14.0	26.5	25.8	18.6
	Appreciation	16.0	15.0	25.5	25.0	18.5
	Cares	15.7	15.9	26.0	24.3	18.0
6 Human relationships						
	Supervisors	7.0	10.8	30.4	31.9	20.0
	Colleagues/subordinates	3.7	6.4	21.7	38.3	30.0
	Overall	4.4	7.4	23.3	38.4	26.5
7 Pecuniary factors						
	Wages	29.4	22.2	20.2	17.0	11.3
Sample size	40,327					
					Unit: frequency (%) except age	

be the result of work-related perceptions. This approach is consistent with works such as Ariely, Kamenica, and Prelec (2008), who examine how the perceived meaning of tasks affect the labor supply, measured by extra tasks. They observed a strong influence of perceived meaning of tasks on the labor supply, stating that the “disutility of effort may depend on the perceived meaning of the task” (p. 676). Fehr and Gächter (1998) also mention that a hostile work environment reduces reciprocity-based extra effort. Therefore, the evaluation of the human resource management of employees’ companies affects their work attitudes in our analyses. For example, employees may be willing to work harder if they are satisfied with conditions in the current workplace. One may wonder the possibility that a happy person responds to work harder. In our analyses, personal traits, such as optimistic and pessimistic, are reflected indirectly in work-related perceptions. The treatment is in line with Dohmen, Falk, Huffman, and Sunde (2008), although they do not focus on work attitudes. They use personality as an independent variable (i.e. the determinant of positive and negative reciprocity).

Denote an unobserved latent variable of  $W$  as  $w^*$ . This is expressed as  $w^* = x\beta + \varepsilon$ , a linear combination of  $x$  (factors that affect  $w^*$ ), together with an error term,  $\varepsilon$  which is independent of  $x$  and follows a standard normal distribution. In our analyses, the dependent variable of work attitudes is based on answers to the following statements: “I try to work more than assigned” (effort) and “I sometimes avoid working” (shirking). Since we are concerned with the reciprocity elicited by employees, we use the concept of incorporating extra effort, but not simple effort levels. The literature uses a similar measure of additional work effort, namely the willingness to make an effort beyond that which is required. The idea is captured by a “willingness to work harder” question in Clark, Masclet, and Villeval (2010). Dohmen et al. (2009) use overtime hours worked by “interpreting overtime hours as a measure of additional work effort” (p. 600). Similarly, Ariely et al. (2008) use extra tasks taken on by subjects. Concepts such as overtime hours worked are similar to our usage of extra effort, although they may not be the same because overtime hours are often paid. On the other hand, the literature uses a question related to reduced effort as a proxy for negative reciprocity (Agell, 2004). Dohmen et al. (2009) use “reduced willingness to work overtime” and “more days of absence.” Absenteeism is closer to our usage of shirking. Specifically, we label negative reciprocity as shirking, but not as reduced effort because one of our objectives is to examine whether shirking is a mirror image of effort, or whether it is fundamentally different from effort (i.e. from the perspective of determinants).

The respondents evaluate each question using a five-point scale, ranging from “(1) I don’t think so.” to “(5) I think so.” Thus, a response related to work attitudes is observed as  $W = j$ , if  $\varphi_{j-1} < w^* < \varphi_j$ ,  $j = 1, \dots, 5$  and  $\varphi_0 = -\infty$  and  $\varphi_5 = \infty$ . The probability of  $W$  is described as  $P(W = j|x) = F(\varphi_j - x\beta) - F(\varphi_{j-1} - x\beta)$ , where  $F$  is the cumulative distribution function of  $\varepsilon$ .

For our analyses,  $x$  can be decomposed into observed factors  $x_1$  (demographic variables such as age, gender, education, marital status, and wages) and unobserved factors  $x_2$  (factors related to work-related perceptions). Since  $x_2$  is unobserved, a factor analysis is used to obtain information related to  $x_2$  from employees’ responses  $z$ . Assuming that  $z = \theta x_2 + \epsilon$ , where  $\theta$  denotes the factor loadings and  $\epsilon$  signifies the error term, we compute factor scores as a proxy of  $x_2$  using the Anderson–Rubin method. A factor score for each respondent is a consistent estimate of the mean of the distribution of  $x_2$ , conditional upon the employees’ responses  $z$ . Additionally, factor scores obtained under the Anderson–Rubin method are perfectly orthogonal (uncorrelated) and have a mean of zero and a standard deviation of one.

One might wonder whether the subjective responses are consistent, because factors such as mood affect the responses. Sorting related questions into a category of interest and taking the average of the responses to those questions is known to provide more consistent responses than using a response from one question (Kahneman & Krueger, 2006). For example, questions such as “I am satisfied with the human relationships at my workplace” and “I am satisfied with the relationship with my colleagues” are sorted into the category of human relationships. If someone responds with

3 to the former question and 5 to the latter question, the average of 3 and 5, namely 4, is used to represent the category of human relationships for that person. Using a single question to represent the category of human relationships might make responses sensitive to factors such as mood. However, taking the average of related responses helps to average out such noise and to obtain subjective responses that are more consistent.

We do not use this approach, because our model extends beyond taking a simple average. We introduce a factor analysis to combine the responses of several questions by considering the relative importance of each question.<sup>1</sup> With regard to unobserved factors  $x_2$ , the principal factor method is used for responses related to work-related perceptions in the survey questions with four factors retained. A varimax rotation with Kaiser normalization is performed on the four factors. The results are presented in Table 3. For example, the column for Factor 1 shows that the first four questions, labeled performance, evaluation standards, work evaluation, and promotion, are similar in nature. Similarly, the column for Factor 2 shows that the next four questions (social evaluation of work, social evaluation of company, holidays and working hours, and welfare system of the company) are similar, and so on.

The four factors are named equity, job satisfaction, company management, and human relationships, in that order. Each factor is composed of questions, as defined in Table 1. The first factor represents subjective judgments related to equitable treatment. The emphasis of past laboratory experiments has been on distributional fairness (pecuniary equity) (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999). However, equity in this study addresses judgments of whether employees feel that they are treated fairly, based on the objective criteria of evaluation beyond monetary compensation. Our concept of equity has a flavor of so-called procedural fairness (or justice) in organizational justice, which has also begun to receive attention from economists (Bolton, Brandts, & Ockenfels, 2005; Charness, 2004; Frey & Stutzer, 2005).

The second factor represents job satisfaction, which arises from social evaluations and working conditions. The job satisfaction term captures the perceived meaning of jobs. Employees attain a stronger sense of self-fulfillment after realizing the worthiness of their jobs, which motivates them to work harder if their working conditions are satisfactory. Little attention was given to the study of

**Table 3. Factor analysis**

	Factor matrix after rotation			
	Factor 1	Factor 2	Factor 3	Factor 4
Performance	0.747	0.171	0.178	0.155
Evaluation standards	0.829	0.186	0.191	0.135
Work evaluation	0.813	0.191	0.184	0.149
Promotion	0.68	0.132	0.251	0.06
Social evaluation of work	0.168	0.758	0.078	0.212
Social evaluation of company	0.14	0.736	0.12	0.219
Holidays and working hours	0.131	0.665	0.193	0.128
Welfare system of company	0.227	0.695	0.301	0.025
Respect by the management	0.253	0.173	0.738	0.169
Appreciation by the management	0.227	0.247	0.801	0.11
Cares by the management	0.256	0.191	0.793	0.123
Relationships with supervisors	0.272	0.153	0.23	0.614
Relationships with colleagues/subordinates	0.104	0.145	0.077	0.812
Overall relationships	0.065	0.185	0.079	0.766



meaning in economics until Ariely et al. (2008) examined how the perceived meaning of tasks affects the labor supply. We take the stance that a social evaluation of a company and work can represent human resource management.

The third factor represents company management, which comprises executive managers' attitudes towards employees. This factor is related to interpersonal justice in organizational justice. Interpersonal justice refers to the respect and propriety received from authorities (see the survey by Ellington and Johannesson (2007) for the relationship between work motivation and respect). The perceived relation to the company is related to the work group identity in Akerlof and Kranton (2008), although the work motivation mechanism assumed in our factor is more practical than that in their model, because they examine a trade-off between effort and monitoring (i.e. distrust of employees).

The fourth factor represents human relationships, which include relationships with supervisors, colleagues, and subordinates. Employees are assumed to make an extra effort when they share good human relationships in the workplace. The term is related to Bandiera, Barankay, and Rasul (2010), who suggest social ties with co-workers as an alternative to pecuniary factors for effective work incentives. Pfeffer (2007) also points out human relationships as a first factor affecting the "discretionary effort of employees" among "many relevant components of an organizational behavior perspective," because social identity is partly derived through affiliations with others.

Work-related perceptions represent sources of reciprocity in the choice of work attitudes. We examine the degree to which work-related perceptions affect work motivation and compare their relative importance in the real labor market. We use a weighted ordered probit model, after considering demographic factors, subjective work-related perceptions, wages, and company, country, and year dummies. The weighted ordered probit model exploits the ranking information contained in the scaled dependent variable of work attitudes. Weights are proportional to the inverse of the probability of being sampled, based on company codes. Therefore, the use of weights enables us to obtain representative results without them being dominated by a large sample size company.

### 3. Results of analyses

Table 4 presents the results of the analyses. The first four columns labeled "effort" present the results obtained when effort is a dependent variable. The columns labeled "shirking" present the results obtained when shirking is a dependent variable. In each case, the first two columns present the estimated coefficients. The other two columns present the marginal effects. A marginal effect is the partial derivative with respect to an independent variable, and is evaluated using the means of the independent variables except discrete ones. The marginal effects measure the quantitative effects of each independent variable on work attitudes, because the signs of the coefficients estimated using ordered probit models could be interpreted as positive or negative relationships, although they do not reveal the magnitudes of the coefficients. For each variable, the first row shows the estimated coefficients, and the second row shows the standard errors. The analysis corrects the standard errors resulting from clustering within company cells. Previous works show that analyses that do not correct for correlation among observations within the same group understate the standard errors of coefficient estimates and, thus, overestimate the t-statistics when studying the effects of aggregate variables on micro units (Moulton, 1990).

#### 3.1. Effort vs. shirking

Our analyses confirm that work-related perceptions have strong relationships with reciprocal work behaviors. However, the relative importance of each factor varies between effort and shirking. Table 4 shows that human relationships have the strongest relationship with effort among the four categories of work-related perceptions. The marginal effect shown in Table 4 presents the change in the probability belonging to the effort score of five when the independent variable increases by one unit. We chose a score of five because management is more concerned about a higher level of effort. In our benchmark model, the marginal effect is estimated as 0.04 on human relationships, and 0.02 on

**Table 4. Results of analyses**

		Effort				Shirking			
		[1]	[2]	Marginal effects		[5]	[6]	Marginal effects	
				[3]	[4]			[7]	[8]
[1]	Equity	0.00	0.00	0.00	0.00	-0.21***	-0.21***	-0.06***	-0.07***
		0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00
[3]	Job satisfaction	0.08***	0.07***	0.03***	0.03***	-0.16***	-0.17***	-0.05***	-0.05***
		0.01	0.01	0.00	0.00	0.02	0.03	0.01	0.01
[5]	Company management	0.06***	0.05***	0.02***	0.02***	-0.23***	-0.24***	-0.07***	-0.07***
		0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
[7]	Human relationships	0.12***	0.12***	0.04***	0.04***	-0.12***	-0.12***	-0.04***	-0.04***
		0.01	0.01	0.00	0.01	0.02	0.02	0.01	0.01
[9]	Relative wage		0.02***		0.01***		0.02**		0.01**
			0.01		0.00		0.01		0.00
[11]	Female	-0.15***	-0.15***	-0.05***	-0.05***	0.13***	0.13***	0.04***	0.04***
		0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01
[13]	Age	0.01***	0.01***	0.00***	0.00***	-0.02***	-0.02***	-0.00***	-0.01***
		0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
[15]	Married	0.03	0.03	0.01	0.01	-0.05***	-0.05***	-0.01***	-0.02***
		0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01
[17]	Others	0.03	0.03	0.01	0.01	0.04	0.05	0.01	0.02
		0.03	0.03	0.01	0.01	0.04	0.04	0.01	0.01
[19]	High school	-0.02	-0.03	-0.01	-0.01	0.04	0.03	0.01	0.01
		0.02	0.02	0.01	0.01	0.03	0.03	0.01	0.01
[21]	Vocational school	0.09***	0.09***	0.03***	0.03***	0.12***	0.11***	0.04***	0.03***
		0.02	0.02	0.01	0.01	0.04	0.04	0.01	0.01
[23]	University	0.16***	0.16***	0.06***	0.06***	0.27***	0.27***	0.09***	0.09***
		0.02	0.02	0.01	0.01	0.05	0.06	0.02	0.02
[25]	Singapore	0.40***	0.77***	0.15***	0.29***	0.44***	0.25***	0.15***	0.08***
		0.08	0.08	0.03	0.03	0.08	0.06	0.03	0.02
[27]	Indonesia	0.33***	0.78***	0.12***	0.30***	0.21***	0.07	0.07***	0.02
		0.04	0.06	0.01	0.02	0.06	0.05	0.02	0.02
[29]	China	-0.13***	-0.12***	-0.43***	-0.04***	-0.10***	-0.12***	-0.03***	-0.04***
		0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01
[31]	Thailand	-0.04	-0.09***	-0.01	-0.03***	0.34***	0.31***	0.10***	0.09***
		0.03	0.03	0.01	0.01	0.03	0.04	0.01	0.01

\*\*statistically significant at the at the 5% level.

\*\*\*statistically significant at the at the 1% level.

company management (Column 3). The impact of human relationships is about twice that of company management. However, company management has the strongest relationship with negative reciprocity among the four categories of work-related perceptions. The marginal effect is estimated as -0.07 for company management in Column 7. This value is much greater in absolute value than -0.04, which is the marginal effect estimated on human relationships. Additionally, inequity is shown to have a strong relationship with shirking, although equity is not related to extra effort. The coefficients are estimated as negative on equity at the statistically significant level in Columns 5-8, while different results are obtained under the effort model specifications in Columns 1-4.

**Table 5. Cross-tabulation**

		Shirking				
		1	2	3	4	5
Effort	1	3.9	1.2	1.4	2.1	4.3
	2	1.9	1.7	1.4	2.0	2.0
	3	3.3	3.0	6.6	3.8	4.4
	4	5.7	4.5	6.1	5.7	4.7
	5	9.9	3.3	4.9	4.8	7.7

Unit: Frequency (%)

Furthermore, an asymmetric degree of impacts is observed between the effort and shirking models. The degree to which work attitudes are associated with work-related perceptions is much greater in Columns 7–8 than that in Columns 3–4. For example, the marginal effect is estimated as  $-0.07$  for company management in Column 7, which is much larger in absolute value than  $0.02$  in Column 3. With the exception of human relationships, employees are more sensitive to subjective work-related perceptions when discussing shirking than when discussing effort. Although some models use the same parameter to describe the intensity of positive and negative reciprocity (e.g. Falk & Fischbacher, 2006), the results support the model of Fehr and Schmidt (1999), which distinguishes the intensity of positive reciprocity from that of negative reciprocity using different parameters.

These results suggest the necessity of distinguishing positive from negative responses (i.e. effort and shirking) when discussing work motivation. Although favorable (or unfavorable) human resource management has strong relationships with positive (or negative) reciprocity, the strength can vary between effort and shirking. Additionally, favorable human resource management does not have as strong a relationship as unfavorable human resource management.

A comparison of the distribution of answers to the effort and shirking questions sheds some light on this issue. We first conducted a cross-tabulation between effort and shirking (see Table 5). The cells in the table indicate the percentages of effort–shirking combinations in the sample. For example, 3.9% of respondents chose 1 for both effort and shirking. The cross-tabulation of our measures for positive and negative reciprocity shows that effort and shirking are not simply two sides of the same coin. One might expect a strong negative correlation between effort and shirking if causality exists, such that diligent (lazy) employees will choose 5 (1) for effort and 1 (5) for shirking. However, no such pattern is observed. For example, the ratio of respondents who chose 1 for effort and 5 for shirking is 4.3%. The idea obtained from the cross-tabulation is confirmed more formally by calculating the correlation. The correlation between effort and shirking is only  $-0.05$ . One may think that shirking is negative effort, because effort is costly for employees and shirking is a way of reducing the cost. However, our analyses imply that shirking is more than just negative effort. It is understandable that shirking is not a mirror image of effort if we consider that it is also a costly behavior. Shirking may induce penalties such as reduced wages, demotion, or being fired when they punish employers by shirking. Shirking has its own domain of reciprocity. There may be an analogy to Herzberg’s classic two-factor theory, where factors affecting job satisfaction (i.e. motivators) differ from those of job dissatisfaction (i.e. hygiene factors) (Herzberg, Mausner, & Snyderman, 1966). Therefore, we conclude that positive reciprocity measured by effort fundamentally differs from negative reciprocity measured by shirking. These results are in line with the approach of Dohmen et al. (2009), who assume that positive and negative reciprocity reflect different personality traits when examining a sample of German respondents.

Considering the domains of reciprocity beyond monetary compensation, the analyses show that equity is not related to effort, although inequity is related to shirking. When employees feel inequitably treated, they may express their unhappiness and resist companies by shirking. These results may be analogous to inequality aversion (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999). Several

laboratory experiments reveal that subjects reject unfair monetary offers to penalize their partners, even though they consequently receive lower pay-offs. In our analyses, employees may resist working hard under unfavorable conditions, even though this could harm the company's business so that they eventually received lower compensation. These results can be designated as inequity aversion.

### 3.2. Fair wages

We extend the analyses by including pecuniary concerns, measured as wages, into the model specifications. The analysis requires a reference to ascertain whether the level of wages is fair. We construct a reference wage (i.e. a fair wage) by stratifying year–country–age–education cells. For example, employee A's reference wage is calculated as the average wage of employees who belonged to A's cohort of age and education in A's country in a given year. This is because behavioral economics literature reports that people compare their circumstances with those of similar people. We divide each employee's wage by the employee's reference wage, and designate these ratios as relative wage ratios. When a relative wage ratio is greater than one, the wage level is regarded as fair.

The analyses use relative wage ratios, instead of the level of wages, as a proxy for pecuniary factors. The literature employs this approach when discussing effort–wage relationships when individuals compare their wages to those of others (Akerlof & Yellen, 1990; Johansen & Strøm, 2001; Summers, 1988). Wage comparisons play an important role in determining an employee's effort if the effort relies on evaluations of whether the wages are fair after comparing them to those of others. The analyses in Clark et al. (2010) suggest the importance of an ordinal comparison of income rather than a cardinal comparison by revealing that relative income determines effort more strongly than the income level does. The importance of fair wages is recognized in the recent work of Cohn et al. (2014), who introduce a survey question that rates the fairness of wages when discussing the determinants of reciprocal effort. Additionally, the usage of relative wage ratios has merits when analyzing cross-country data. While we can convert wages denominated in local currencies to US dollars using exchange rates, Indonesian employees perceive, for example, an amount of \$30 differently to the way Chinese employees do. In our analyses, taking ratios enables us to have a unit-free index of pecuniary perceptions, although different currency units are used to measure wages across countries. Therefore, unit-free wage indices allow us to make meaningful comparisons among international respondents. Additionally, we standardize relative wage ratios so that their marginal effects become comparable to those of the four categories of work-related perceptions. Using this setting, we examine whether employees are concerned more with non-pecuniary factors than they are with pecuniary factors.

The results indicate that non-pecuniary factors have stronger relationships with work attitudes than pecuniary factors do. For example, the marginal effect on human relationships is estimated to be 0.04 (Column 4). Since about 30% of the sample report an effort score of five, an increase in the human relationships factor by one standard deviation increases this fraction to about 34%. On the other hand, an increase in the relative wage factor by one standard deviation increases this fraction to about 31%, because the marginal effect on the relative wage ratio is estimated to be 0.01 (Column 4). Similar results apply when comparing the marginal effects of other non-pecuniary factors with the relative wage factor. Such comparisons are possible because both factors are standardized with a mean of zero.

The importance of non-pecuniary factors and the results of the analyses regarding non-pecuniary factors in the previous section are robust. The results of our benchmark models do not change with the inclusion of relative wage ratios. The results in Columns 2 and 4 for effort and Columns 6 and 8 for shirking reveal that the estimated coefficients are similar to those of our benchmark models in Columns 1 and 3 for effort and Columns 5 and 7 for shirking. We also examine the robustness under an alternative specification, where a fair wage perceived by employees is included (not included in the table). The analyses use survey responses described as “7. Pecuniary factors” in Table 1. Again,

the results are not sensitive to the inclusion of a fair-wage perception, although the analyses are conducted using a sub-sample of fewer observations.

Lastly, the coefficients estimated for these pecuniary factors might necessitate some discussion because the results suggest the importance of comprehensive analyses of both pecuniary and non-pecuniary factors. From Row 9 in Columns 2, 4, 6, and 8, a higher wage in a reference group is shown to be associated with extra effort and shirking. While the former result is intuitive, the positive relationship between a higher wage and shirking is less so. A possible interpretation is that employees who earn higher wages modulate the pace of their work according to a system of priorities. This result may be related to the findings in Clark et al. (2010), who show a relationship between reduced effort and income for individuals with higher past incomes. They argue that those who have earned higher incomes in the past decrease their effort level because their marginal utility from their income has decreased. In fact, the single regression of effort (or shirking) on the relative wage ratios provides the signs of the coefficients expected in laboratory experiments: lower (higher) wages are related to shirking (extra effort) (not shown in the table). The coefficients are estimated as negative (positive) for shirking (effort) at the statistically significant level. These results could suggest why findings from laboratory experiments might not apply to work motivation in practice, where employees consider non-pecuniary factors together with pecuniary factors.

#### 4. Concluding remarks

Recent research has recognized the limitations of a pecuniary approach in standard economics. Increasingly, research shows the importance of factors beyond material incentives. One such factor is reciprocity. Among the recent works related to reciprocity, this study examines how work relationships are related to work motivation by distinguishing between positive and negative work attitudes (e.g. effort and shirking).

The research is motivated to examine whether behavioral implications obtained in past laboratory experiments apply to motivation in practical work environments. For this purpose, we extend the sources of reciprocity beyond monetary compensation. Thus, we introduce broader aspects of work relations, such as company management. Additionally, we examine both positive and negative reciprocity and contrast their determinants to those of shirking. These points distinguish our study from other works, because most laboratory experiments study effort solicitation based on pecuniary incentives.

Our results reveal that positive and negative reciprocity are not simply two sides of the same coin. The domains of reciprocity are shown to have different relationships between effort and shirking. Positive work-related perceptions, particularly human relationships, are strongly associated with higher reported levels of effort. Lower shirking levels are associated, in particular, with positive perceptions of company management. Equity is not related to effort, but inequity is associated with increased shirking. Additionally, an asymmetric degree of impacts is observed between effort and shirking. The degree of the relationships between work attitudes and work-related perceptions is much greater for shirking than those found for effort. The asymmetric findings between effort and shirking confirm that positive reciprocity is distinct from negative reciprocity.

These results present salient implications. Non-pecuniary factors may be non-negligible sources of reciprocal work behavior when compared to the relationships of pecuniary factors with work motivation (see Columns 4 and 8 in Table 4). Reciprocity induced by non-pecuniary factors challenges traditional economics, where pecuniary factors play a primary role. Additionally, the relationships of different factors vary between effort and shirking, although some economic models incorporate the assumption of symmetric impacts. While our analyses are based on a sample of Japanese multinational companies, it would be an interesting to examine whether the results apply to samples from other countries. We leave this as a possible topic for future research. If our results do apply to other countries, then our analyses provide useful implications for reconstructing the classic economic models of work behavior.

One last remark regarding causality remains. We are aware of potential econometric problems in the current analyses. In the analyses, actions (i.e. work attitudes captured by extra effort and shirking) are assumed to be the realization of emotions (i.e. work-related perceptions). The logic is similar to that of revealed preference theory, where actions such as purchasing are considered to be the realization of preferences. However, there are probable instances of reversed causality if unobserved characteristics associated with dependent and independent variables exist. This is not particular to our study, but applies to any work that employs a similar research design using real-life cross-sectional perception data. In contrast to laboratory experiments, which can extract factors of interest by controlling for other factors, this study focused on comprehensive analyses of real-life work motivation. While we need to be careful in interpreting the results, we believe that the analyses would provide helpful information when reconsidering the analytical framework of work motivation, which focuses on pecuniary factors only.

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#### Note

1. Please refer to books such as Fabrigar and Wegener (2011) for more information on factor analyses.

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