

The effects of horizontal pay dispersion on effort

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Abstract

Horizontal pay dispersion, which is defined by wage differences between peers, has been recently proposed as being more influential in regard of fairness considerations of workers than vertical pay dispersion. The effect that horizontal pay dispersion has on effort is tested in this research. Moderation effects of reciprocity are included in the study, since theory suggests that reciprocal workers would enhance effort when fair dispersion is imposed on them. Several hypotheses are tested by the use of a vignette and survey study. Proposed hypotheses include the effect of horizontal pay dispersion on effort, and the amount of reciprocal respondents present in the sample. Furthermore the dissection of this trait in positive reciprocity and negative reciprocity is tested, and the relationship between pay dispersion and effort is tested on moderation effects of reciprocity. This research empirically supports the hypothesis that low horizontal pay dispersion shows a significantly higher effort level across the studied sample group (N=185). Though there is no evidence that reciprocity moderates between horizontal pay dispersion and effort. However the distinction of this trait in a positive and negative form of reciprocity shows to provide different relationships with effort. The data suggest that people who tend to reciprocate negatively do not provide a significant effect on effort, while people who tend to reciprocate positively show a positive effect on effort. Non-reciprocal workers, being workers that do not show positive or negative reciprocity, provide no significant moderating effect on the relationship between pay dispersion and effort. Resulting from this lack of moderating effect by non-reciprocal workers, the data do suggest a significant negative effect of non-reciprocal workers on effort level. Finally, the important finding of dissecting positive and negative reciprocity has been supported by the results from the moderation analysis, as well as by the lack of correlation ($r = -0.055$, $p\text{-value} = 0.455$) between positive and negative reciprocity.

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1 Introduction

Ever since the first corporations that came into existence pay dispersion has always been present. Back in the 17th century there were enormous wage gaps in the VOC (East-Indian trading company) between an ordinary seaman earning 100 guilders, compared to a governor making 1200 guilders excluding free housing and provisions. These differences have never changed, and it has become a widely discussed academic and professional issue. This discussion could be based on a general negative consensus that exists about the enormous vertical wage gaps between a CEO and the line staff as proposed by Wade, O'Reilly & Pollock (2006). On the other hand it could be that individuals considered the wages of their peers to be either too high or too low, like the assumption that regards horizontal pay dispersion as very important (Gächter & Thoni, 2010).

A major and developing area of research in strategy deals with how an increasingly knowledge based market can move away from seeing knowledge as a commodity in a firm. This field of study focuses on seeing knowledge as an individual resource, lying within the workers of a firm, instead of considering it as a collective resource. Building further on this paradigm scholars study how individuals can be pushed towards optimal creation, retention and sharing of this knowledge (Lowendahl, Revang & Fosstenlokken, 2001). Much research has been focused on the behavioral foundations behind this knowledge value creation process, and in this thesis these foundations are included as well. As described above pay dispersion can be considered in different lights, but the assumption that is presented in this paper is that horizontal dispersion, meaning the dispersion between peers, is of higher influence on most workers than vertical dispersion (Gächter & Thoni, 2010). The effects of

horizontal dispersion on workers is a line of research that has a major lack in empirical evidence, though some influential scholars have already proposed the importance of this research gap (Gächter & Thoni, 2010; Fehr, Goette & Zehnder, 2009). Regarding the effects of this horizontal dispersion in combination with knowledge value creation, effort is an interesting variable to utilize. Effort in itself is a general term that entails a wide array of underlying traits, such as cooperation, knowledge sharing or working overtime. Consequently, it covers many aspects of the knowledge value creation process. Therefore, this study focuses on how horizontal pay dispersion influences effort of workers in a firm.

Another facet that is included as a part of this research are the behavioral foundations of workers in a firm, and specifically the presence of reciprocity, as being a factor of influence on this relationship with effort. Reciprocity is a regularly used term in this study, and can be shortly explained by a phrase of Rabin (1993, p. 1281): “People like to help those who are helping them, and to hurt those who are hurting them”. So in general an urge for fairness can be attributed to workers that would be described as reciprocal. Relating this to pay dispersion, workers showing reciprocity are expected to show an urge for fair wages in a firm. Reciprocal workers exhibit clear wage comparison characteristics, meaning that they are comparing their own wages across co-workers, in a three person gift exchange game. In this comparison fairness of wages is considered as highly important (Gächter & Thoni, 2010). De Cremer & Van Lange (2001) propose that in the opposite of self-interested workers, reciprocal workers are more inclined to equality in wages. Therefore reciprocal workers are expected to prefer low horizontal pay dispersion.

The propositions of horizontal pay dispersion and reciprocity are the main part of this study, which starts with an extensive literature review of the existing theory

relating to this topic in chapter two, followed by a theoretical framework in where the argumentation for the hypotheses is presented in chapter three. The research design is clarified in chapter four. The results section clarifies the findings of this study in chapter five. These results are discussed and concluded in chapter six and seven respectively.

2 Literature Review

This literature review outlines the theoretical foundation of this study, by starting with an introduction of the ‘homo economicus’ paradigm of workers in a firm and its application in wages. This is followed by reciprocal theory of fairness and wages, which is followed by clarifications of positive and negative forms of reciprocity, and how pay dispersion can be divided in horizontal and vertical pay dispersion. The literature review is concluded with the theoretical foundations concerning the importance of equity to reciprocators, which leads to the proposed research question.

2.1 The Homo economicus

The homo economicus has been the norm of economists for decades, considering man as a fully rational and self-interested being. It is very prominent in many mainstream economic theories such as transaction cost and agency theory (Rocha & Goshal, 2006). The theory of the homo economicus can be explained well by how Keynes (1937) proposes guidelines to his readers in how men should “save their faces in uncertain times as rational, economic men”, meaning that he views rationality as the only and superior mindset of men. This view is not only a paradigm on behavior, as well as an imposed guideline on how men should behave. This urge for rationality is an

important facet in the view that many economic scholars that study in line with the homo economicus model have. The analytical rigour of rationality makes this model very useful in developing theories in many areas of research. Subsequently to rationality the homo economicus model exposes itself in another very important factor, namely self-interestedness. In this light this paradigm considers men to behave in such a manner to maximize individual payoff. Consequently they will not care about the payoff of others, if it would not be of influence on their own payoff (Fehr & Gintis, 2007).

When imposing the facets of rationality and self-interestedness on the before mentioned well-known economic theories, transaction cost- and agency theory, they are the main assumption in these theories. In transaction cost theory (Coase, 1937) the assumption is that all transaction decisions are made in consideration of all the attached costs. This theory suggest that firms, or man, make a fully rational decision based on costs that are attached to all required effort needed to establish the correct price, finding the correct product and the collection of other information. In agency theory (Eisenhardt, 1989) the problem that arises when an agent needs to be aligned to the goals of a principle is handled. In this well-known theory agents are to be assumed fully self-interested, since incentives are needed to align them to the principal goals while they would otherwise not. This rational self-interested view that is at the foundation of these theories has been defined as the only behavioral assumption man can exhibit (Mueller, 1986). The main argument that provides reason for using this paradigm, is that the analytical rigor of economic models with rational self-interested agents is considered high. Therefore it is still adopted by many researchers.

When the view of rationality and self-interestedness is imposed on worker's behavior, and specifically their reaction to wages, scholars expect an urge for income

maximalization (Lazear & Rosen, 1981; Ehrenberg & Bognanno, 1990).

Corresponding to this view, scholars developed the so called 'tournament model' of reward schemes. Lazear and Rosen (1981) state that by having a high dispersion of wages, workers will exert a higher level of effort. They assume that the presence of competition among workers for higher wages results in higher effort levels, which in return is positive for the output levels of a firm. It can be seen as a tournament where the winner receives a price, such as a higher wage or a promotion, which can lead to perks and privileges.

Many contemporary researchers that propose mankind to be fully self-interested still correspond to the view that high pay dispersion will lead to higher effort. Recent studies in Belgium, Denmark and Sweden all suggest positive effects of high pay dispersion on effort levels (Lallemand, Plasman and Rycx, 2004; Eriksson, 1999; Heyman, 2005). Ehrenberg and Bognanno(1990) found a similar relationship in golf tournaments. Though the view that mankind in its very nature is always a self-interested rational being is not very well supported when considering that individuals do show purely altruistic deeds. After all "many people vote, do not cheat on their taxes, and contribute effort to voluntary associations" (Ostrom, 2000, p. 137).

Subsequently the studies that support the tournament model are all based on specific circumstances such as golf tournaments, which in return might not be very generalizable when regarding organizational pay dispersion issues.

2.2 The Homo reciprocans

"People like to help those who are helping them, and to hurt those who are hurting them" (Rabin, 1993, p. 1281). This specific phrase constitutes exactly what reciprocity entails. People are willing to sacrifice their own material well-being to

help those who are being kind, and people are willing to sacrifice their own material well-being to punish those who are being unkind (Rabin, 1993). Thus a reciprocal action is modelled as the behavioral response to an action that is perceived as either kind or unkind (Falk & Fischbacher, 2006). Illustrative for reciprocity is that people repay gifts and take revenge even in interactions with complete strangers, even if it is costly for them and yields neither present nor future material rewards (Fehr & Gächter, 2000), implying that this is a purely altruistic deed.

Scholars in this line of thought assume that there is a fraction of the population that cares for fairness and with that equitable outcomes (Fehr & Schmidt, 1999). Several researchers (Fehr & Falk, 1999; Gächter & Falk, 2002) provide evidence that 20% to 40% of humans are self-interested, while the majority (40-60%) is reciprocal. Therefore they show that not only a fraction of a population consists of reciprocators, but that this fraction is significantly larger compared to self-interested workers. This leads to the hypothesis that the homo reciprocans might be a superior theory to use when regarding pay dispersion issues in comparison to the homo economicus theory.

This theory of the homo reciprocans, which underlines the importance of perceived fairness to reciprocators, and their desire for egalitarian dispersion of wages, led many scholars to study the effects of intrafirm wage inequality on firm performance. Reciprocators are expected to react to kind and fair actions, in this case thus egalitarian or equitable dispersion of wages, with increasing levels of effort. On the other hand a high dispersion of wages, and thus a perceived unfairness in the considerations of reciprocators, is expected to result in lower levels of effort.

With these considerations in mind Bloom (1999) studied Major League Baseball teams in order to test the effect of high pay dispersion on team performance, and found that a high dispersion of pay within a baseball team has a negative effect on

both the individual performance of the players as well as the organizational success. When work groups need to support the goals of the firm, firms need to increase group cohesiveness (Levine, 1991), so in this view it is vital to develop a feeling of fairness and kindness to create cohesiveness within a team or firm. Regarding this feeling of fairness, Akerlof & Yellen (1990) propose that workers proportionately withdraw effort as their actual wage falls short of their fair wage, and on the other hand increase effort when pay is higher than the contracted amount. Many authors have since provided more evidence in support of the negative relationship between pay dispersion and effort. Fredrickson, Davis-Blake & Gerard Sanders (2010) provide support for the negative relationship between pay dispersion and firm performance. They found that within the top management teams that they studied social comparison was present between the members of this team, and a high dispersion of wages resulted in lower firm performances. Next to this Brown, Falk & Fehr (2004) state that successful long term work relationships exhibit fair rent sharing from the organization, combined with high effort from the workers. This proposes the relationship pay dispersion has with effort by assuming that the opposite of this negative relationship exists as well, fair wages correlate well to high effort. This assumption is not completely supported by Gächter & Thoni (2010), who provide support for the negative relationship between pay dispersion and work effort, though state to have found no support for the increase in effort due to fair wages on average.

Considering this effect, the link that is generally presented between pay dispersion and effort is the composition of the work force in regard of their social value orientation. Several scholars propose to impose wage schemes that are based on the relative amount of reciprocal workers in a firm. This theory suggests that with increasing amounts of reciprocal workers in a firm a fair wage scheme is needed,

while with high amounts of self-interested workers individual monetary incentives can be imposed on workers to increase effort levels (Bridoux, Coeurderoy & Durand, 2010; Englmaier & Leider, 2008). In this theory fairness is an important factor. Individual monetary incentives will not help to increase the collective value creation of reciprocators, since they will consider this incentive scheme unfair. Therefore they will punish this perceived unfairness with lower contributions to the collective value creation. When fair, and thus egalitarian, wage schemes are imposed on work forces with a large amount of reciprocators; it will help increase the collective value creation of the firm. The proposition that the effort levels of a firm are dependent on the composition of the work force has been made clear by Jirjahn and Kraft (2007) as well, who found that there is no uniform relationship between wage dispersion and firm performance. They state that the specific circumstances of the firm should be taken into account in such a matter, which can be related to the reciprocal workforce composition of a firm. Empirical evidence that supports the proposition that firms with a relatively high amount of reciprocators would perform better with a fair wage scheme is still lacking though.

2.3 Positive and negative reciprocity

When looking into this matter of reciprocity a dissection is needed on the basis of positive and negative forms of reciprocity. Conceptually, one can distinguish between positive reciprocity, how people reward kind actions, and negative reciprocity, the extent to which people react to unkind actions (Dohmen, Falk, Huffman & Sunde, 2009). Both of these types have been elaborately studied in experimental settings.

Fehr, Kirchsteiger and Riedl (1993) provide evidence on positive reciprocity in a two-stage game where buyers set a price for a good, while sellers provide the

corresponding product quality. It is shown that the seller will increase the quality according to the price, subsequently supporting the assumption that positive reciprocity is present in their sample group. Another example of positive reciprocity is that successful long-term relations exhibit generous rent sharing and high effort from the very beginning of the relationship (Brown et al., 2004). This shows that firms that show generous, and with that perceived fair, rent sharing will have their reciprocal workers enhance their effort levels. Generous rent sharing in this matter can be conceived as a kind action, which is responded to with a high effort level as a reward. This assumption is supported by the findings of Levine (1991), which propose that narrowing wage dispersion would lead to a sense of group cohesiveness in a firm, which in return would enhance the marginal production of firms. Related to positive reciprocity it can be interpreted that the reciprocal response to fair wages in this sense is higher cooperation among workers, which can be considered as effort.

On the other hand negative reciprocity can be distinguished, which involves punishing unkind behaviour. This trait is well explained in the ultimatum game. In this game a proposer is given a certain amount of money, and proposes to share this with a responder. When the responder accepts, they both get their share of the money, but when rejected they both get nothing. In the view of the homo economicus the responder would accept any offer except for zero, since it will yield a surplus reward over rejecting. Camerer & Thaler (1995) show that this is not the case, and responders will reject most offers that are significantly lower in comparison to the reward the proposer will get. In this sense the fact that the proposer's share of the money is significantly higher compared to the responder, is considered as unkind. The responder will punish this unkind behavior at own cost by rejecting, thus showing negative reciprocity. Another finding in support of the existence of negative

reciprocity has been found by Kube, Marechal & Puppe (2006). They performed a study in where they had students participate in a one-time job opportunity in book data-entry that presumably would pay 15 euro per hour. Right before the actual start of their working activities 10 of the 30 subjects were told that their wages would not be 15 but 10 euro per hour without providing any justification. The group that was proposed the unkind treatment showed a significantly (p -value = .003) lower effort level in comparison to the neutral group that was paid the 15 euro per hour. At the end of the work day the unkind treatment group showed a 27 percent lower data entry figure in comparison to the neutral group.

2.4 Horizontal and vertical pay dispersion

Wage inequality is to be considered in two different views as well. On the one hand this can be seen as a comparison along the different hierarchical levels of an organization. On the other hand this comparison can be made between co-workers from the same hierarchy level. This is respectively the difference between vertical and horizontal pay dispersion.

Many scholars studied the effects of vertical pay dispersion. Wade, O'Reilly & Pollock (2006) propose that workers will take a CEO salary as a reference point regarding the fairness of their own payoff. Bok (1993) even states that the size of executive salaries and bonuses, even if one grants that they are justified, can have a negative impact on others in the organization by engendering feelings of inequity that can weaken loyalty and increase dysfunctional conflict. This is supported by Cowherd & Levine (1992) that found a positive relation between vertical pay equity and product quality. They compared the pay and input of low level manager to those of

the top three levels of management in 102 business units, and thus found a positive relationship when this relationship was found to be fair.

Wade et al. (2006) declare that social comparison is the reason for this negative effect of vertical pay dispersion. Though bearing in mind that social comparison is the main reason for this negative effect it is more likely that Akerlof and Yellen's (1990) "fair wage" is to a large degree determined by 'horizontal' comparisons among employees. It is deemed to be more likely that workers take the colleagues from their department and hierarchical status as reference group for social comparisons regarding pay (Gächter & Thoni, 2010). Fehr, Goette and Zehnder (2009) go a step further and consider horizontal dispersion a larger constraint on policies, and a phenomenon with more implications than vertical dispersion. They state that even the most basic implications that horizontal pay dispersion might have on worker performance have not been studied yet, and therefore this is a clear gap in research. Proposed is for example the implication this might have for a firm, whether this leads to an incentive to segregate workers of different skill levels, since the skill disparities might lead to wage differences that are not to be considered equitable by peers. Though the proposition made that no research has been done on the effects of horizontal pay dispersion might not be correct, since there is extensive research done on horizontal pay dispersion with studies on sports teams (Simmons & Berri, 2010; Mondello & Maxcy, 2009; Bloom, 1999). However the contextual and organizational differences between sports teams and corporations do not make these studies very relevant for corporate practice.

When examining studies that looked into the comparison that reciprocal workers make with their peers, several biases are shown. Workers often have an inflated view of their own contribution to the firm, and would therefore consider their

own wages to be fair at a higher level compared to their peers (Zenger, 1994). A second bias is that workers show a tendency to compare their wages only to those that are comparable in performance but earning more (Martin, 1981). Consequently neglecting those that are performing equally well and earning less. These notions should be taken into account when establishing wage schemes based on a reciprocal work force.

2.5 Reciprocal urge for equity

The importance of equity in reward schemes has been made clear by Schmitt and Marwell (1972) who gave 10 male and 11 female pairs a choice: whether to work cooperatively in pairs or alone. In the situation where cooperation was in place, one subject would receive a multiple of two, three or five times the earnings of the partner. A large amount of participants withdrew from cooperation caused by the inequity. This withdrawal percentage was subject to the magnitude of inequity, in where the largest inequity of five times that of the partner resulted in 40 percent of the participants withdrawing from cooperation. This gives rise to the belief that wage equity is vital in team production. The assumption that reciprocators have an urge for equity is later proven many times in experimental settings such as the public good games where punishment was installed (Fehr & Gächter, 2000; Carpenter & Seki, 2005). In these games strong reciprocal people have the possibility to punish unfair behaviour by others, to enhance equity in a group. Although these public good games do not relate directly to wage dispersion, it does show the importance of equity to reciprocators in general. And to go back to the willingness to punish unfair behaviour at own costs with no future reward (Fehr & Gächter, 2000) as stated earlier, it is clear that reciprocators have a strong urge for equity.

When proposing the hypothesis that horizontal dispersion will more likely be the reference point of social comparison, the effect this will have on effort is tested. Combining this with the element that reciprocal workers are vital in all firms, by their size and characteristics of reacting strongly on fairness issues, reciprocity offers an interesting moderating variable in this study. Reciprocal workers can react to horizontal pay dispersion in both a positive sense by increasing effort when perceiving a sense of fairness, or negatively by decreasing effort by a perceived sense of unfairness. When imposing this urge for equity on pay dispersion interesting is whether and how effort levels change according to changing levels of pay dispersion. Therefore the research question derived from this literature study is:

How does horizontal pay dispersion influence effort and to what extent is this moderated by the reciprocal characteristics of workers?

This contributes to the theoretical advancement in the studies on pay dispersion and the relationship with effort levels, by creating a clear empirical outcome on how and if these effects exist in a horizontal setting. It builds further on the assumption by Schmitt & Marwell (1972) that workers prefer horizontal wage equity in their work environment. And will empirically test the proposition by Gächter & Thoni (2010) that the “fair wage-effort relationship” as stated by Akerlof & Yellen (1990) is actually present in a horizontal setting. Next to the contribution in regard of actual presence, it will quantify this presence in clear figures, and is tested on a larger amount of respondents, making it more generalizable. Subsequently reciprocal moderation testing is included, to test whether the propositions of Bridoux, Coeurderoy & Durand (2010) and Englmaier & Leider (2008) that take a firm level perspective on reciprocal

reaction to wage dispersion, would hold on an individual level for this specific sample group. The practical relevance of this study can be found in the increased effort levels firms can achieve by incorporating the results of this study in their reward schemes.

3 Theoretical Framework

3.1 Effort & Pay dispersion

Work effort has been proposed by many scholars as pivotal for organizational success. (Green, 2004; Demsetz, 2002). The knowledge value creation process that has been named so important for firms these days is reliant on this specific output, and subsequently much attention has been paid on effort. By any means it seems clear to all that when workers provide more effort, value creation will be higher and consequently provides the firm with a superior resource. Lin & Huang (2010) developed a theoretical construct named knowledge withholding, which they defined as the likelihood that an individual will give less than full effort in contributing knowledge. Therefore assuming that knowledge contribution, and with that knowledge value creation, is dependent on effort of workers. This illuminates the significance of effort on the knowledge value creation process, and with that the motivational factors behind the level of effort as subsequently important as well.

People, and with that workers in a firm, are sensitive to fairness perceptions and have an urge for equity. Several vignette studies (Kahneman, Knetsch & Thaler, 1986; El Haji & Stoelhorst, 2010) on fairness perceptions in relation to wage decreases show that this feeling of fairness is present in people. These studies propose several hypotheses in regard of the fair wage perceptions of workers in relation to wage decreases, and subsequently relate these fairness perceptions to the effort levels

exhibited. Shown is that the perception of a fair wage decrease is subject to the magnitude of knowledge input and productivity of the individual worker, as well as the profitability of the economic activities of the firm. More importantly it shows that the perceived fairness of wages has a significant impact on the effort level of workers. This is in line with the theory presented by Akerlof & Yellen (1990), who propose in their "fair wage-effort" hypothesis that performance might depend on the perceived fairness of their compensation. The findings by El Haji & Stoelhorst (2010) that state workers to enhance their perceived fairness according to their own input suggest that workers will compare their input to others. This is to a large degree determined by 'horizontal' comparisons among employees. It is likely that people take their peers, that is, co-workers who are comparable to them, as reference group for social comparisons (Gächter & Thoni, 2010). Thus the perceived fairness of wages to workers is most likely developed in comparison to their "horizontal" peers, and can be translated as comparing within a firm's echelon or department. This urge for equity is so clearly settled in workers that they, as showed by Schmitt and Marwell (1972), would rather work alone for far less compensation when there was pay dispersion present in their team. Horizontal pay dispersion is therefore a fundamental factor regarding wage schemes.

Hypothesis 1: Absence of horizontal pay dispersion has a positive effect on effort

3.2 Reciprocity

When referring to the importance of fair wage dispersion to workers, their social value orientation has been deemed as very important (Bridoux, Coeurderoy & Durand, 2010; Englmaier & Leider, 2008). In comparison to self-interested workers,

reciprocators are not only motivated by own payoff, but by other's payoff as well as the fairness of the distribution of pay (Bridoux, Coeurderoy & Durand, 2010). Wage schemes should therefore be developed according to the compound of reciprocal and self-interested workers in a firm (Bridoux, Coeurderoy & Durand, 2010; Englmaier & Leider, 2008). Thus since reciprocal workers exhibit an urge for fairness (Falk & Fischbacher, 2005; Fehr, Kirchsteiger & Riedl, 1993; Fehr & Gächter, 2000), they are therefore considered very important to a firm in their perceived fairness of corporate wage schemes. While self-interested workers will not likely engage in comparison of wages to others, reciprocal workers are expected to enhance their effort levels according to the pay dispersion present in firms. Therefore the composition of reciprocal and non-reciprocal workers in a firm is very important for horizontal pay dispersion considerations.

Reciprocity is a trait that has been studied extensively. Especially in experimental settings, many authors discovered that a certain part of their sample showed clear signs of reciprocal behavior. Fehr and Falk (1999) find that 11 out of 44 (25 percent) workers showed self-interested behavior, while 29 out of those 44 (65 percent) showed reciprocal behavior in a setting where they tested the effect of wage changes on effort. Similar findings are found by Gächter and Falk (2002), when they performed two experiments, where in a one shot experiment 53.3 percent showed reciprocal behavior, while in a repeated game 67.8 percent showed this trait. In both type of experiments they found that 20 percent showed self-interested behavior. More recently similar results (64% reciprocal) have been found by Maximiano, Sloof & Sonnemans (2007) in a comparison between work force size, as well as by Falk, Fehr & Fischbacher (2008) in their study on fairness intentions (76% reciprocal). These tests have been performed in an experimental setting, though should hold in survey

studies as well. Since none of these tests have shown results that propose the reciprocal composition in their sample group to be lower than 50 percent, it can be expected that at least half of the sample will show reciprocal behavior.

Hypothesis 2: More than 50 percent of the respondents is reciprocal

The studies that underline the above hypothesis treat reciprocity as a general trait present in an individual. Although they indeed found support for either positive or negative forms of reciprocal behavior, the possible distinction of these two forms within an individual have not been discussed often. Dohmen, Falk, Huffman & Sunde (2008) are one of the first to include this distinction in their research and show that there is no significant correlation between positive and negative reciprocity in an individual ($r = 0.021$, p -value = undisclosed).

Relating this to pay dispersion this would mean that the same person that enhances effort due to fair wages, would not necessarily decrease effort when high pay dispersion is present in an organization. Falk, Fehr & Fischbacher (2008) suggest the same by presenting findings where individuals show exclusively positive or negative reciprocal behavior, as well as a combination of both in a moonlighting game. They found that although 40 percent of their sample showed both positive and negative reciprocity, the percentages of exclusive positive or negative reciprocity were 21 and 15 respectively. This proves that it cannot be assumed that a person that is positively reciprocal will indeed show negative forms of this trait as well.

Concerning these differences within an individual Fehr & Gächter (2002) find that anger is an important factor concerning punishment, and thus negative reciprocity.

Dohmen et al. (2008) therefore consider that negative as well as positive reciprocity is built on different emotions, and for that reason cannot be regarded as single trait.

The distinction of positive and negative reciprocity is in this light very important in relation to pay dispersion, while reciprocity cannot be assumed as a general trait present in workers, and with that their response to pay dispersion will differ accordingly. Respondents that show only positive reciprocal behavior, cannot be used to infer relationships that relate to punishing pay dispersion, while this reaction is based on negative reciprocity. On the other hand solely negative reciprocators cannot be used to test for rewarding no pay dispersion. This shows the importance the distinction has to test for reciprocity, while the omission would lead to wrong conclusions when testing for their moderating effects..

Hypothesis 3: There is no correlation between positive and negative reciprocity within individuals

3.3 Reciprocal moderation

As has been discussed before reciprocal workers are likely to respond to pay dispersion with decreasing effort levels, according to their perceived (un)fairness of wages. Therefore this trait is likely to exhibit itself as a moderating variable on the relationship between pay dispersion and effort. As has been shown important is the distinction of positive and negative reciprocity within an individual, while this will expose itself in different responses to pay dispersion, and can be mutually exclusive. As Brown et al. (2004) propose, successful long-term relationships exhibit generous rent sharing and high effort. This underlines the assumption that positive reciprocal workers will enhance effort when fair wage schemes are imposed on them. Therefore

this feeling of fairness, thus with fair wages, would most likely lead to a stronger positive effect for positive reciprocators on effort.

On the other hand very high pay dispersion can be present in firms, and as proposed by experimental games where punishment was installed (Fehr & Gächter, 2000; Carpenter & Seki, 2005), people are willing to punish at own cost to restore equity in a team. As well that an unkind treatment in the form of high dispersion of pay, will lead to lower effort levels as shown by Kube et al.(2006). Therefore it is expected that the negative effect of high pay dispersion on effort is stronger for negative reciprocators.

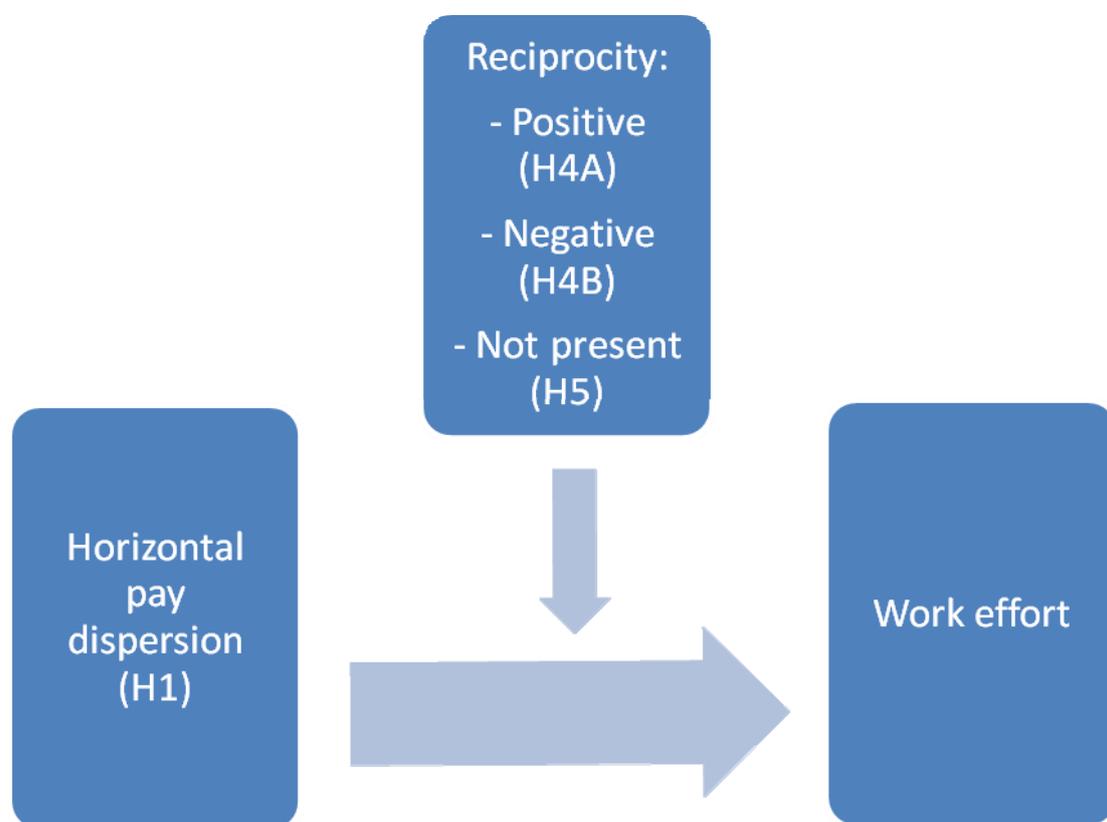
Hypothesis 4a: Positive reciprocators exert more effort in case of absence of horizontal pay dispersion

Hypothesis 4b: Negative reciprocators exert less effort in case of high horizontal pay dispersion

Concerning non-reciprocal workers, the dispersion of pay is not likely to influence effort levels. This type of workers will not indulge in social comparison and will not change their work effort levels according to the relative fairness of their pay compared to their peers. For example altruistic workers show a form of unconditional kindness, therefore one can expect them to exert high effort levels regardless of the dispersion of wages present in a firm (Fehr & Gächter, 2000). Another example of non-reciprocal workers are self-regarding workers that are only in pursuit of their own well being, not caring about social goals (Rabin, 1993). Relating this to pay dispersion, expected is that workers that show other social value orientations than reciprocity will

not consider equity important, and will therefore not change their effort level according to the dispersion of pay.

Hypothesis 5: Horizontal pay dispersion has no effect on effort levels of non-reciprocal workers



These hypotheses cover the most basic segmentations of how the presence of reciprocity moderates the relationship between pay dispersion and effort, but does not include many other moderating variables such as job satisfaction or age, which might be related to the magnitude of positive or negative reciprocity. The results of this study applies to all firms, but should be considered within a team or department and

do not hold for entire firms. As stated in the text social comparison is done with peers and not across all areas of corporations. Effort can be considered a general variable which does not cover a specific form of effort such as cooperation, knowledge sharing or other more specified effort features. As well as the fact that pay dispersion is not divided into types of pay, such as variable and fixed. With these limitation in mind this study should give a proper indication of how the relationship between horizontal pay dispersion and work effort is, and provides a foundation on which further research can elaborate.

4 Research design

The design of this research is based on a survey as well as a vignette study. This quantitative research design allows for proper statistical analysis, and is therefore suitable for establishing relationships between the proposed variables. As a result it is very useful for this particular research question, while quantitative inferences are necessary. Another advantage of this method is that it lends itself for the acquisition of a larger amount of data in comparison to qualitative research, which will make the results more generalizable. The usage of a vignette will further enhance the validity as being the closest to actual experiments with regard to control. And the reliability of this study is enriched by keeping the respondent anonymous. The usage of quantitative collection methods erodes the possibility of observer error or bias (Saunders, Lewis & Thornhill, 2009).

The respondents (N=185) consist of 49 percent males and 51 percent females, that are mostly (85%) from Dutch origin. The sample is largely drawn from students at the University of Amsterdam, at the faculty of business and economics. This results in a highly educated sample group, consisting of 81 percent master level students,

compared to 16 percent at the bachelor level. Only a minor amount of the respondents have a vocational (2%) or lower educational (1%) level. The lack of real workers in the sample group is not a constraint, since reciprocity can be present in all people, and therefore their responses are a valid representation of the overall population. The sample size of 185 is large enough to properly infer the hypothesized relationships, based on the amount of treatments (2). The respondents are presented a very short survey of six questions, which has already been used before by Dohmen et al. (2008), and showed valid results. This survey measures positive and negative reciprocity, or when not present non-reciprocal behaviour. In advance of this survey they are offered a vignette where either no or high pay dispersion is present, and they are asked to give their level of work effort this will yield. As stated the survey that is used has already been extensively tested by Dohmen et al. (2008), and was included in the German socio-economic panel study (SOEP, 2005). The respondents were asked to indicate on a 7-point Likert scale how close a statement is to their personality (for survey see Appendix 9.1).

Statements 1, 4 and 6 of this survey measure for positive reciprocity, while 2, 3 and 5 measure for negative reciprocity. An example of a statement measuring for positive reciprocity is “If someone does me a favour I am prepared to return it”. A 1 on the Likert scale indicates that it does not apply to the respondent at all, while a 7 means that it perfectly suits the respondent. Therefore respondents that in general score low on all statements do not show much signs of reciprocity, and can therefore be used for testing hypothesis 5. Respondents that score high on questions 1, 4 and 6 are used as evidence for hypothesis 4a, while respondent with medium to high scores on statements 2, 3, and 5 are used as evidence for hypothesis 4b.

Before this survey a vignette is presented after which the respondents are asked to score their work effort on a scale from -7 to 7, which ranges from counter productive effort levels in the negative part of the scale to positive effort levels in the positive part. The usage of a vignette method allows for proper research control, as being closest to an actual experiment as research method. Hughes & Huby (2002) propose vignette studies as valuable research tools in the study of respondents lives, attitudes and behavior. This method provides two different test groups with a different treatment to test for a different response. In this case the different treatments consist of either high or no pay dispersion, while their response is in effort level. Because only the tested variable provides the difference in the vignette setup, inferences can be made that apply to that specific variable only. One vignette will be presented here as an example while the other can be found in the appendix (9.1):

There is a medium sized firm that employs several workers. These workers perform the same duties. And they have the same educational background, work experience, and firm tenure. There is a difference of 400 Euro in wages per month between the highest and lowest paid worker.

With the application of negative levels of work effort in the scale that ranges from -7 to 7, respondents are capable of showing their reluctance to high pay dispersion, by showing counter-productive effort levels. The negative figures on the scale should be considered as an effort level where the respondent is deliberately hindering the achievement of goals within the organization. The proposed wage difference of 400 Euro is based on Dutch governmental wage boxes (wage boxes Dutch government, 2009). Dutch governmental workers have their wages based on transparent wage

boxes, which are wage levels that align with function level and tenure. Since this is the largest employer in the Netherlands, which is the country where the sample is taken, a difference of one wage box will most likely be considered as a wage difference worthy of changing effort levels by the respondents.

5 Results

In the following chapter the results of the study are discussed. The first section starts with a reliability analysis of the compounded variables, which is followed by descriptive statistics of the variables used, before the hypotheses will be tested. At the end of the chapter there are some notions on other findings that are not specifically related to the proposed hypotheses.

5.1 Reliability

The collection of data resulted in several items that had to be transformed into variables. The computation of both positive and negative reciprocity required the calculation of means for three items from the survey respectively. To analyze whether the reliability of these items in relation to the eventual variable was sufficient, tests were run to check on the Cronbach alpha. For negative reciprocity the tests showed a Cronbach alpha ($\alpha=0.8$) between the three items that were used to test for this trait, which is clearly higher than the generally assumed threshold ($\alpha=0.7$). The same tests were run for the items resulting in the variable of positive reciprocity, and this showed a Cronbach alpha ($\alpha=0.6$), which is lower than the required threshold as mentioned before. Though not only would the reliability plummet from deleting any of those items, it can also be assumed that when this same test is exposed to a larger sample it would most likely show higher reliability, as it has been used and published by the German Socio-Economic panel before on a very large sample, showing reliable results.

5.2 Descriptive statistics

Before any inferences were executed the variables were examined using descriptive statistics as presented in table 1. Positive reciprocity has a mean ($M = 5.51$, $S = 0.82$) that is indicating on a 7-point Likert scale that the respondents in general showed clear signs of this trait. Negative reciprocity ($M = 3.06$, $S = 1.27$) on the other hand, showing significantly lower features of this trait among the respondents. When looked at how many respondents scored above a 4 on either of the traits, 178 (96%) of the respondent show signs of positive reciprocity (Figure 1, Appendix 7.3), while only 49 (26%) show signs of negative reciprocity (Figure 2, Appendix 7.3). Here must be stressed that individuals can show positive reciprocity, negative reciprocity or a combination of both. Therefore the percentages of positive and negative reciprocity overlap, showing that there are respondents in the sample that are both positively as well as negatively reciprocal.

When exploring the demographics of the sample group, the variable gender shows a very balanced sample, with 49 percent males compares to 51 percent females. The educational data show that the sample includes quite highly educated respondents. 149 (80%) study at Master level, while 29 (16%) out of the 185 study at Bachelor level. The number of respondents that had vocational (4) or high school (2) as their highest attended education is negligible. When considering the nationality of the respondents the majority is Dutch, with 158 (85%) against only 27 (15%) of foreign nationality (see Table 2).

Regarding effort ($M = 9.29$, $S = 3.35$) this variable shows that in general the respondents show a small amount of effort. Through the first 7 points on the scale respondents show counter-productive effort, which are the negative returns as explained in the research design. These have been placed in a positive scale ranging

from zero through fifteen, for statistical purposes. And thus with 8 being no effort, a 1.29 point increase over this level of no effort represents little effort. Though when looked at how this variables changes according to the pay dispersion in place, it shows that respondents that were presented a vignette with no dispersion show a higher effort level (M=9.96, SD=3.1), while respondents that were presented a vignette with high pay dispersion show a lower effort level (M=8.63, SD=3.5) (see table1).

Table 1

	N	Mean	Std. Deviation
Positive Reciprocity	185	5.51	0.821
Negative Reciprocity	185	3.06	1.270
Effort	184	9.29	3.347
Effort with no dispersion	92	9.96	3.085
Effort with high dispersion	92	8.63	3.482

Table 2

	Absolute	Percentage
Gender: Male	91	49%
Gender: Female	94	51%
Education: Master	149	81%
Education: Bachelor	29	16%
Education: Vocational	4	2%
Education: High school	2	1%
Nationality: Dutch	158	85%
Nationality: Foreign	27	15%

When the effort levels of the respondents are specified according to their reciprocal characteristics, positive reciprocity shows a higher effort level (M=9.84, SD=3.45) in comparison to negative reciprocity (M=9.33, SD=4.59). Though either form of reciprocity shows higher results in regard of effort levels when compared to non-reciprocal respondents (M=8.75, SD=3.14). These descriptive data are based on a threshold value of reciprocal presence averaging 5.5. As described before, an overlap of positive and negative reciprocity exists, while individuals can exhibit solely positive or negative reciprocity, as well as a combination of both. Thus when an individual shows both positive and negative reciprocity, they are included in the calculations of effort means and standard deviations of both positive and negative reciprocity in Table 3.

Table 3

	Positive reciprocal	Negative reciprocal	Non-reciprocal
Effort Mean	9.84	9.33	8.75
Effort Stand. Dev.	3.45	4.59	3.14

Another important feature that should be regarded in advance of testing the hypotheses is whether there is correlation among the variables used (see Table 4). Important to look at is whether there is no possibility for multicollinearity between independent variables, which is not the case between both pay dispersion and reciprocity ($r = .041, p \text{ value} = .582$; $r = -.007, p \text{ value} = .926$), as well as between positive and negative reciprocity ($r = -.055, p \text{ value} = .455$). What it does show is a correlation between effort and pay dispersion ($r = .199, p \text{ value} = .007$), which is something that will be looked into later in this chapter. Important to mention in this

section is that the dummy variable that has been used to code the vignettes, code a high dispersion with 0, and no dispersion with 1. Therefore positive relationships between effort and pay dispersion in this sense, show that there is a positive relationship with no pay dispersion.

Some other interesting correlations that are found are a negative correlation between males and negative reciprocity ($r = .190$, p value = .01), indicating that males are more likely to show signs of this trait in comparison to females ($r = -.190$, p value = .01). And finally a positive correlation ($r = .220$, p value = .003) between positive reciprocity and effort, demonstrating that people who are positively reciprocal are more likely to exert higher effort. Other correlations such as the correlation between the nationality items and pay dispersion is a random outcome, that does not infer any true relationship. The significant correlations of high school with effort and negative reciprocity do not infer much either, since as mentioned above only two respondents can be categorized in the group with high school as highest attended education, which cannot be conceived as generalizable.

Table 4

		Pay dispersion	Effort	Positive Reciprocity	Negative Reciprocity	Gender	Nationality	High school	Vocational	Bachelor	Master
Pay dispersion (No =1, High =0)	Corr.	1									
	Sig.										
Effort	Corr.	,199**	1								
	Sig.	,007									
Positive Reciprocity	Corr.	,041	,220**	1							
	Sig.	,582	,003								
Negative Reciprocity	Corr.	-,007	-,116	-,055	1						
	Sig.	,926	,116	,455							
Gender (Male= 1, Female= 0)	Corr.	,049	-,005	,080	-,190**	1					
	Sig.	,510	,944	,278	,010						
Nationality (Dutch = 1, Foreign = 0)	Corr.	-,166*	-,036	,135	,034	,131	1				
	Sig.	,024	,623	,066	,644	,075					
Highschool	Corr.	-,104	-	,041	,147*	-,002	,105	1			
	Sig.	,159	,007	,577	,046	,982	,156				
Vocational	Corr.	,075	-,013	-,062	,003	,072	,149*	-,016	1		
	Sig.	,309	,860	,399	,965	,331	,043	,834			
Bachelor	Corr.	,047	,065	-,087	-,035	-,230**	-,136	-,045	-,064	1	
	Sig.	,526	,383	,239	,639	,002	,065	,542	,386		
Master	Corr.	-,044	-,003	,093	-,008	,187*	,043	-	-,308**	-,893**	1
	Sig.	,552	,968	,208	,917	,011	,558	,216**	,000	,000	

5.3 Testing hypotheses

After thoroughly exploring the variables and checking the reliability the hypotheses can be tested.

Hypothesis 1 predicts that no pay dispersion has a positive effect on effort, and that high pay dispersion has a negative effect on effort. Simple linear regression analysis (Table 4) was conducted to test for this relationship. In this regression the dummy variable of pay dispersion was used as independent variable, and effort is used as dependent variable. Gender, nationality and education were included as control variables but showed no significant effects. The first model that consists only of control variables is not significant (p value = .168), though when the independent variable of pay dispersion is included it becomes significant (p value = .014) at the 5% level. This model has an R-square of 0.075, indicating that this model predicts 7.5 percent of the variation in effort. Neither of the control variables but high school education (p value = .011) show significant results, and the significance of high school can be questioned due to the fact that only two respondents can be classified in this group. Though pay dispersion does have a significant ($B= 1.230$, p value= 0.014) positive effect on effort. Since the dummy variable of pay dispersion codes no dispersion with one, and high dispersion with zero, this result shows that no pay dispersion results in a 1.230 higher effort level compared to high dispersion. Therefore hypothesis 1 is supported. No pay dispersion has a positive effect on effort, and high pay dispersion has a negative effect on effort.

Table 4

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	,206 ^a	,042	,016	3,321	,042	1,579	,168
2	,273 ^b	,075	,043	3,274	,032	6,165	,014

Coefficients			
Model		B	Sig.
1	(Constant)	9,781	,000
	Gender (Male =1, Female =0)	,063	,902
	Nationality (Dutch =1, Foreign =0)	-,074	,918
	Highschool	-6,775	,006
	Vocational	-,791	,664
	Master	-,515	,460
	2	(Constant)	9,111
Gender (Male =1, Female =0)		-,022	,966
Nationality (Dutch =1, Foreign =0)		,236	,741
Highschool		-6,219	,011
Vocational		-1,136	,528
Master		-,450	,513
pay dispersion (Absent =1, High =0)		1,230	,014

Hypothesis 2 states that a minimum of 50 percent of the sample is reciprocal. This is tested using the two computed variables of positive and negative reciprocity. A threshold score of 5 or higher on the 7-point Likert scale was used to determine the presence of positive, negative or no reciprocity within an individual, and dummy variables were created to establish this presence. The dummy variable that measures non-reciprocal workers was used to determine the presence of reciprocal workers in

general, since this dummy variable measures the presence of either kind of reciprocity, and therefore the 0-value in this variable is equal to the combination of both positive and negative reciprocity. Consequently this variable has been subject to a binomial test (Table 8, Appendix 9.2) where a hypothesized value of 0.5 was used to determine whether the test score was significantly different. The results from this test indicate that with this threshold, there is a significant (p value < 0.01) difference between the amount of reciprocal workers (82 percent) and the hypothesized value of 0.5. Therefore hypothesis 2 is supported; more than 50 percent of the respondents is reciprocal.

Hypothesis 3 predicts that there is no correlation between positive and negative reciprocity within an individual. The difference in means between positive and negative reciprocity already suggest that they are not similar traits, since positive reciprocity is present more clearly ($M=5.51$) in the sample, compared to negative reciprocity ($M=3.06$) (see Table 1). The difference in their respective effort levels propose the same, with positive reciprocators having a higher effort level ($M=9.84$) compared to negative reciprocators ($M=9.33$) (see Table 3). But to genuinely test for a lack of correlation between positive and negative reciprocity the correlation matrix (Table 4) is examined. Here the variables of positive reciprocity and negative reciprocity, without being transformed into dummy variables, show no significant correlation ($r = -.055$, p value = $.455$). Therefore hypothesis 3 is supported, there is no correlation between positive and negative reciprocity within individuals.

Following from the supported hypothesis 1, the moderating effect of reciprocity is tested. Hypothesis 4a predicts that the positive effect of no pay dispersion on effort is moderated by positive reciprocity. Testing for this moderation requires a hierarchical regression, where a dummy variable was used for the positive

reciprocal trait. Similar to the before mentioned dummy variables the threshold that is used to determine the trait present or lacking is 5.5. Furthermore these variables have been centred before an interaction variable is created to counter multicollinearity. This stepwise regression (Table 5) develops four subsequent models in where step by step variables are included to test whether it develops significant results.

Table 5

Model	R	R Square	Adjusted R Square	Change statistics		
				R Square Change	F Change	Sig.
1	.206 ^a	.042	.016	.042	1.579	.168
2	.273 ^b	.075	.043	.032	6.166	.014
3	.314 ^c	.099	.063	.024	4.701	.031
4	.314 ^d	.099	.058	.000	.006	.937

	Model 1		Model 2		Model 3		Model 4	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.
High school	-6.793	.006	-6.234	.011	-6.188	.011	-6.186	.011
Vocational	-.792	.664	-1.133	.530	-.999	.576	-1.007	.575
Master	-.517	.460	-.444	.519	-.418	.540	-.416	.543
Gender (Male=1)	-.062	.902	.029	.953	.148	.767	.151	.764
Nationality (Dutch=1, Foreign =0)	-.074	.917	.233	.745	.069	.922	.066	.926
Pay dispersion (No=1, High =0)			1.230	.014	1.153	.020	1.153	.020
Positive reciprocity					.527	.031	.527	.032
PositiveRecipocity x Paydispersion							-.019	.937

The first two models in this test are similar to the test done for hypothesis 1. Model one includes solely the control variables, while in the second model pay dispersion is included. In the third model the moderating dummy variable of positive reciprocity is

included. The fourth and last step includes an interaction variable, which is a product of positive reciprocity and pay dispersion.

The first model shows to be insignificant (p -value = .168). High school as control variable is significant (p -value = .006), though the amount of respondents that can be classified in this group is negligible (2). The second model is significant (p -value = .014) at the 5% level, and shows an R-square value of .075, which obviously is similar to hypothesis 1. Pay dispersion was positively ($B= 1.230$) related to effort at the 5% level in this model. When the dummy variable of positive reciprocity is included the model shows a significant (p -value = .031) increase in the R-square of .024, indicating that these variables together explain more of the variation in effort, then pay dispersion on itself. Positive reciprocity has a positive effect ($B = .527$) on effort which is significant at the 5% level. Though when the interaction effect is included in the fourth model it becomes insignificant (p -value = .937), with no increase in explanatory power (R square change = .00). Therefore hypothesis 4a is not supported, positive reciprocity does not moderate the positive effect of no pay dispersion on effort.

Hypothesis 4b predicts that negative reciprocity moderates the negative effect of high pay dispersion on effort. The same procedure is required as for hypothesis 4a, thus a stepwise regression is performed. The dummy variable of pay dispersion is inversed, since we are testing for negative effects of high pay dispersion, therefore high pay dispersion in this test has been labelled a 1, while low dispersion has been labeled a 0. The interaction variable is created similar to hypothesis 4a, but with the difference of inversed pay dispersion, and negative reciprocity instead of positive reciprocity.

Table 6

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig.
1	.206 ^a	.042	.016	3.321	.042	1.579	.168
2	.273 ^b	.075	.043	3.274	.032	6.165	.014
3	.273 ^c	.075	.038	3.283	.000	.000	.985
4	.273 ^d	.075	.032	3.292	.000	.005	.945

	Model 1		Model 2		Model 3		Model 4	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.
High school	-6.775	.006	-6.219	.011	-6.219	.011	-6.224	.012
Vocational	-.791	.664	-1.136	.528	-1.136	.529	-1.136	.530
Master	-.515	.460	-.450	.513	-.451	.515	-.452	.516
Gender (Male=1)	.063	.902	-.022	.966	-.021	.967	-.021	.967
Nationality (Dutch =1, Foreign =0)	-.074	.918	.236	.741	.236	.742	.239	.740
Pay dispersion (Absent=0, High =1)			-1.230	.014	-1.230	.014	-1.230	.015
Negative reciprocity					.005	.985	.005	.985
Negative reciprocityx Paydispersion							-.034	.945

The first model shows the same insignificant (p -value = .168) figures as the first model of positive reciprocity, since it includes the exact same variables. Subsequently the second model is similarly significant as well (p -value = .014). Though when the variable of negative reciprocity is included the model becomes very insignificant (p -value = .985). This means that not only a moderation effect of negative reciprocity does not exist, but there is no effect from negative reciprocity on effort at all (Table 6). Therefore hypothesis 4b is not supported. Negative reciprocity does not moderate the negative effect of high pay dispersion on effort.

Hypotheses 5, pay dispersion has no effect on effort levels of non-reciprocal workers will be tested similar to hypothesis 4a and 4b. Though instead of that the presence of a moderation effect would support the hypothesis, it would here refute it. To test for this effect the same hierarchical regression analysis is performed as with hypotheses 4a and 4b, though then predicted that there will be no significant model when the interaction effect is included.

Table 7

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics		
					R Square Change	F Change	Sig.
1	.206 ^a	.042	.016	3.321	.042	1.579	.168
2	.273 ^b	.075	.043	3.274	.032	6.166	.014
3	.310 ^c	.096	.060	3.245	.021	4.165	.043
4	.312 ^d	.097	.056	3.252	.001	.239	.626

	Model 1		Model 2		Model 3		Model 4	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.
High school	-6.793	.006	-6.234	.011	-6.202	.011	-6.189	.011
Vocational	-.792	.664	-1.133	.530	-1.024	.567	-1.071	.551
Master	-.517	.460	-.444	.519	-.442	.518	-.428	.532
Gender (Male =1)	-.062	.902	.029	.953	.116	.816	.136	.787
Nationality (Dutch =1, Foreign =0)	-.074	.917	.233	.745	.089	.900	.073	.919
Pay dispersion (Absent=1, High =0)			1.230	.014	1.157	.020	1.171	.019
Nonreciprocal					-.495	.043	-.496	.043
Nonreciprocalx Pay dispersion							.119	.626

Similar to the above mentioned tests, model 1 provides insignificant results, while model 2 provides significant effects. Model 3 in this matter is significant as well (p –

value = .043) at the 5% level with an R-square of 0.096, showing an increase of .021. The dummy variable of non-reciprocal workers shows a negative effect on effort ($B = -.495$) at the 5% level. This shows that non-reciprocal workers are related negatively with effort, meaning non-reciprocal workers have a negative influence on effort levels of an organization. In the fourth model the interaction variable is included and the significance (p -value = .626) of the model is eroded, with only a very minor increase in explanatory power (R square change = .001) (Table 7). Therefore hypothesis 5 is supported. There is no moderation effect of non-reciprocal workers on the relationship between pay dispersion and effort.

5.4 Negative reciprocity and Gender

Resulting from the correlation cross tabulation executed in the beginning of the statistical analysis there were some interesting relationships that were further explored. It showed a significant ($r = -0.190$, p value = 0.01) correlation between negative reciprocity and gender. Since this suggests that males are more likely to show signs of negative reciprocity, it provides an interesting relationship to explore, since it might be of interest to scholars that include gender in their studies on reciprocity. To analyze this a one-way ANOVA (Table 9, Appendix 9.2) was executed. This showed that there was a significant (p -value = .01) difference between males and females in their negative reciprocity scores, with males ($M = 3.30$, $S = 1.297$) showing higher scores compared to females ($M = 2.82$, $S = 1.203$).

6 Discussion

In the following section the results of this study will be discussed. After a sample group of 185 was tested on their reciprocal traits and reaction to pay dispersion several inferences were made. The results will be discussed after which the contribution it has to existing theory is illuminated. The chapter is closed with recommendations for future research and practice.

6.1 Interpretation of results

Interpreting the results from this research, the hypothesis will be discussed in manner. Regarding the first hypothesis that is looking at the relationship between pay dispersion and effort, Schmitt & Marwell (1972) had already proposed, workers would rather work in a team when pay was equal, though when pay was not fair, workers preferred to work alone. Resulting from this research, as well as the public good games where punishment was installed (Fehr & Gächter 2000, Carpenter & Seki, 2005), suggested is that low pay dispersion has a positive effect on effort levels. The hypotheses that low horizontal pay dispersion has a positive effect, and high pay dispersion has a negative effect on effort, are well supported from the data, with significant effort differences between the two vignettes used. This not only confirms the hypothesis as presented by Schmitt & Marwell (1972), but extends this into clear quantitative findings. The difference of 1.230 in effort level between low and high pay dispersion shows a 8.2 percent increase in effort when a fair wage scheme is imposed on a firm.

The second hypothesis stating that a minimum of 50 percent of the respondents are reciprocal was supported as well. The threshold that is used, deciding

whether an individual is considered reciprocal, is naturally a deciding factor in this cause. When the threshold would be increased to where only individuals that scored either an averaged six or seven are considered reciprocal, it would mean that the hypothesis would not be supported. Though since this would consider only strong reciprocal people, it would not be in line with the hypothesis. Therefore the findings are in line with the research done by Fehr & Falk (1999) and Gächter & Falk (2002). It supports the notion that depending on the method used, and the strength of reciprocity that is required, a minimum of 50 percent of a population consists of reciprocal people.

Thirdly I predicted no correlation between positive and negative reciprocity, showing that these are separate traits, that in no sense have to be present within the same person at all times. This hypothesis has been supported in line with the findings ($r=0.021$) by Dohmen et. al (2008). There is little difference in the correlation between both studies, where both figures lay around zero. This study therefore underlines again that positive and negative reciprocity are built upon different emotions, and with that are different traits, and should be treated as such.

Extending on these findings the moderating effect of reciprocity has been tested. The first inference regarding positive reciprocity show that this trait does not act as a moderator in this relationship. The finding that positive reciprocity is not moderating this effect, but does have an effect of its own on effort shows that there are others factors through which positive reciprocity relates to effort, or that positive reciprocals in itself show higher levels of effort. These findings are quite interesting, since it infers that fair horizontal pay dispersion does have a positive effect on effort, but that positive reciprocal workers are not interacting in this effect, thus should this not be imposed to encourage solely this group of workers. A reason for this can be

found in the assumptions made by Bridoux, Coeurderoy & Durand (2010). They propose that the effect motivational systems have on effort levels of reciprocators can be caused by how other workers change their effort level. Meaning that other workers decrease their contribution due to a motivational system, and this decrease in effort of co-workers is considered unfair by reciprocators. Subsequently reciprocators will decrease their own contribution due to their fairness principles. Relating this to positive reciprocators is that they are reluctant to free riding and modify their effort level according to this type of fairness, and not directly to their own conception of a fair pay dispersion. When looked at negative reciprocal workers on the other hand, the results show that there is no relation at all between negative reciprocators and effort levels. This might be best explained to the above mentioned emotions on which negative reciprocity is build. Like Fehr & Gächter (2002) explain, negative reciprocity is built on emotions such as anger. Likely these emotions do not so much relate to effort levels shown by workers, but illuminates itself in other forms.

The last hypothesis that concerns non-reciprocal workers was supported by the data from this study. The non-reciprocal data does not show any moderation effects, though it does show a negative effect on effort levels in general. This means that non-reciprocal workers provide a significant negative effect on effort levels of organizations. This can be explained by the fact that a large part of a non-reciprocal work force can be classified as self-interested. And since self-interested workers are only in pursuit of their own well being, not caring about social goals, their contribution to the collective value creation of firms is restrained by their own payoff (Rabin, 1993). Concluding that although there are no moderation effects found, it is found that the effects on effort of different reciprocal traits can be classified clearly.

Positive reciprocity has a positive effect on effort, non-reciprocal traits show a negative effect, and negative reciprocity has no effect on effort at all.

A final extra finding concerning the significant relationship between gender and negative reciprocity is very interesting, though it might not be related to the central topic. Male workers thus show to be more negatively reciprocal in comparison to female workers, which might be interesting for future research. And though I found that negative reciprocity has no effect on effort, and thus the importance of males showing more negative reciprocity is not present in this specific matter, it might have an important effect in other studies..

6.2 Contribution to existing theory

A large contribution has been made regarding the results of hypotheses 1: absence of horizontal pay dispersion has a positive effect on effort. This hypothesis was based on findings by Schmitt & Marwell (1972) that found in an experimental setting that people would rather work alone compared to working in a team with unfair pay dispersion. This study was based upon a small sample of 42, and was not related to effort level, but solely to a preference for individual or group work. Therefore the findings in regard of hypothesis 1 show a new relationship, between horizontal pay dispersion and individual effort levels that has not been researched before, which is a clear contribution to theory.

A second contribution of this study is found in the testing for reciprocal moderation. Though the hypotheses were not supported, interesting results were retrieved from this test. At first the finding that positive reciprocity does not moderate the relationship between pay dispersion and effort, but does have a significant positive effect on effort by itself. This shows that as Brown et al. (2004) have proposed that

successful long term work relationships show both generous rent sharing and high effort, is not supported by this data. The results suggest that positive reciprocators are in general of positive influence on effort, but this is not linked to pay dispersion present in a firm. This can be related to the propositions made by Bridoux, Coeurderoy & Durand (2010) as well. They propose to develop wage schemes based on the relative reciprocal composition of the workforce. Though as the findings of this study suggest positive reciprocators will not enhance their effort level according to their perceived fairness, or egalitarian distribution, of wages. Secondly it contradicts the proposition by Kube et al. (2006) in regard of negative reciprocity. Kube et al. (2006) proposed that negative reciprocators will punish high dispersion of pay with low effort, but my results showed that neither does negative reciprocity provide a moderating effect, as well as an individual effect on effort. Therefore this study suggests that negative reciprocity should not play any role in work effort considerations, and again are not to be considered a variable in wage scheme development as proposed by Bridoux, Coeurderoy & Durand (2010) and Englmaier & Leider (2008). Finally the non-reciprocal testing showed results in line with the hypothesis, and proved in a different method that non-reciprocal workers, such as altruistic or self-regarding workers, do not care about dispersion of pay. Concluded from the results of the moderation testing, only positive reciprocity is of importance in the consideration of work effort levels of firms, while negative reciprocity does not influence this variable at all. Non-reciprocal workers show a negative influence on work effort levels, although this is most likely only to be attributed to the sub-group of self-interested workers.

6.3 Limitations

Several limitations in this study should be acknowledged. At first the methodology that is used makes use of a purely hypothetical analysis. Therefore the results might not reflect results that are drawn from the true work field.

Another limitation regarding this study is that the respondents of this study are from a single sub-culture of a population, which might be skewed caused by the level and type of education most respondents had. The little amount of lower educated respondents, as well as the collection of data mostly from Amsterdam based students might create an image that is not representative of by example lower educated workers in another country.

The final limitation of this research can be found in the quite ambiguous definition of effort and pay. Effort is a general term, that could be quite ambiguous to some respondents, as well as ambiguous to people interpreting the results. And pay can be classified into more specific terms, to create a clearer image in this matter.

6.4 Recommendations for future research

Regarding future research I would advise scholars to pursue studies in exploring when workers consider co-workers their horizontal peers that would qualify for wage comparison. This study shows that horizontal pay dispersion has a negative effect on the effort levels of workers, though it is not clear from this study, when someone considers their peers as horizontal. For example, does a car factory worker that creates windshields only considers the other workers that perform this duty their horizontal peer, or does he or she considers every worker in the factory a horizontal peer?

Secondly more research is needed into the relation between positive reciprocity and effort. It is clear that it does not positively moderate the effect of fair

pay dispersion, though there should be other reasons why having positive reciprocal workers in a firm, leads to higher effort levels. On the other hand it can also be very interesting to study why non-reciprocal workers have such a negative effect on effort, and how these workers can be managed to tackle this phenomenon. More empirical research is needed in both these matters.

Another interesting avenue for future research can be found in what may be considered as a limitation in this particular research, the methodology that is used makes use of a purely hypothetical analysis. It might be very interesting to conduct a field research, whether certain reciprocal compositions of a work force do moderate the negative relationship between pay dispersion and effort, which is in line with the expectations of Bridoux, Coeurderoy & Durand (2010).

Another recommendation for further studies is to incorporate a sample that is more representative for an entire population. In this study the sample group was largely drawn from students at the University of Amsterdam, and with that skewed towards this sub-culture. A more rigorous approach would be to collect data from a wide array of sub-cultures within a population.

The final recommendation for future research is to specify effort and pay into clearer terms. Effort could for example be specified into cooperation or knowledge sharing, making it clearer for the respondent as well as easier to interpret. Pay on the other hand could as well be classified into fixed and variable pay.

6.5 Recommendations for practice

Practice should use the results of this study in their advantage by incorporating fair wage schemes to increase the effort levels of their workers. As found in this study imposing a horizontal fair wage scheme will increase effort levels by 8.2 percent,

which is a difference that is difficult to accomplish for a firm with other measures. The quite clear advantages that can be gained with this measure would naturally outweigh any possible advantage of imposing horizontal unfair dispersion of wages. Another implication for practice is that they can incorporate reciprocal testing in their selection procedures, since this study has shown that positive reciprocal workers are advantageous for a firm when considering effort levels, as opposed to non-reciprocal workers that show negative effects in this substance.

7 Conclusion

This vignette study, studied a sample (N=185) of mainly business and economic students on several hypotheses regarding horizontal pay dispersion and reciprocity. Hypotheses include the amount of reciprocal respondents in the sample, the correlation between positive and negative reciprocity, the effect of horizontal pay dispersion on effort, and the moderating effect of reciprocity. The main finding is that workers exert a significantly lower effort level when an unfair dispersion of pay is present in a firm, which is the most important contribution of this study to theory and practice. Secondly the effects of reciprocity are included, and in the contrary to the hypothesized expectation that reciprocity plays a moderating role in this relationship, it shows neither as positive or negative form any interaction effects. The dissection of reciprocity into positive and negative reciprocity does provide some interesting information though. It showed that reciprocity should not be considered as a general trait in this cause, since negative reciprocity does not play any role in the effort levels of workers, and despite the fact that positive reciprocity does not moderate this relationship it does have a positive effect on effort. Finally as hypothesized non-

reciprocal workers do not have a moderating role in this relationship, since they are not likely to be touched by fairness issues, but they do have a negative effect on effort in general, which is an interesting fact to be further explored.

8 References

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9 Appendices

9.1 surveys

1. If someone does me a favour I am prepared to return it
2. If I suffer a serious wrong I will take revenge as soon as possible, no matter what the cost.
3. If someone puts me in a difficult position, I will do the same to him/her.
4. I will go out of my way to help someone, who has been kind to me before
5. If someone insults me, I will insult him/her back.
6. I am ready to undergo personal costs to help someone who helped me before.

There is a medium sized firm, that employs several workers. These workers perform the same duties. And they have the same educational background, work experience, and firm tenure. There is a difference of 400 Euro in wages per month between the highest and lowest paid worker.

Or

There is a medium sized firm, that employs several workers. These workers perform the same duties. And they have the same educational background, work experience, and firm tenure. There is no difference between the wages made by these workers.

When you would be a worker in this firm, how would your work effort be, measured on the following scale, ranging from counter-productive to very high respectively:

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

9.2 Tables

		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)
Reciprocity	Rec	,00	151	,82	,50	,000 ^a
	Non_Rec	1,00	34	,18		
	Total		185	1,00		

Anova on Negative reciprocity					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.707	1	10.707	6.853	.010
Within Groups	285.938	183	1.563		
Total	296.645	184			

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
male	91	3.30	1.297	.136	3.03	3.57	1	6
female	94	2.82	1.203	.124	2.57	3.07	1	7
Total	185	3.06	1.270	.093	2.87	3.24	1	7

9.3 Figures

Figure 1

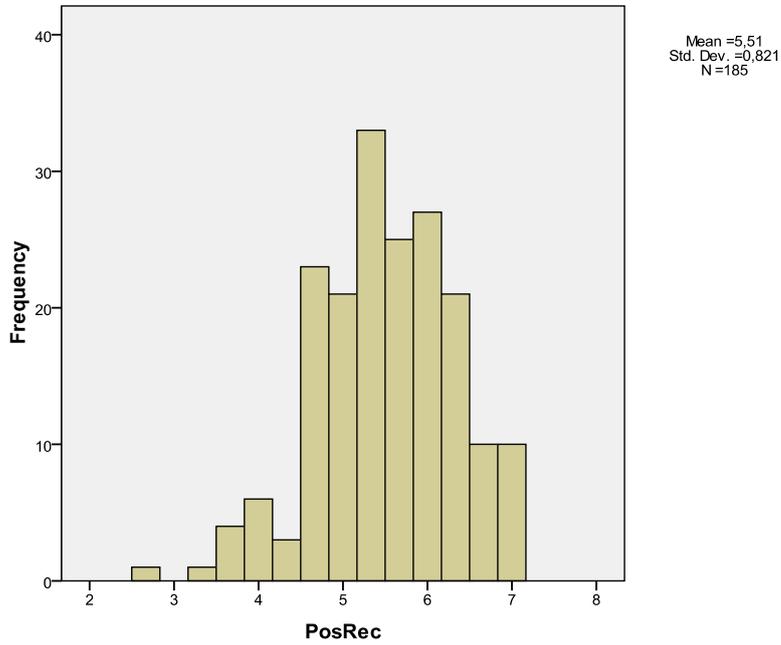


Figure 2

