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Relative Pay, Productivity, and Labor Supply

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Abstract:
Relative pay—earnings compared with the earnings of others doing a similar job, or compared with one's earnings in the past—affects how much individuals would like to work (labor supply) and their effort on the job; it therefore has implications for both employers and policy makers. A collection of recent studies shows that relative pay information, even when it is irrelevant, significantly affects labor supply and effort. This effect stems mainly from those who compare unfavorably, as essentially all studies find that awareness of earning less than others or less than in the past significantly reduces labor supply or effort on the job. Comparing favorably, however, has mixed effects. For labor supply, awareness of pay differences either has a positive effect, when the comparison is with past pay, or no effect, when the comparison is with others' pay, and it generally has no effect on exertion of effort.

Keywords: relative pay, effort, labor supply, lab and field experiments
JEL Classification: J22, J31

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1. Introduction

Relative pay concerns matter and have a potentially negative effect on labor supply and productivity. To avoid these negative consequences, it is important to consider the work environment when designing optimal incentives. Specifically, the transparency of differential pay and productivity differences across workers, as well as the ease with which differential pay or cuts in pay can be explained to workers can help to determine the success or failure of using differences in pay to incentivize employees. These concerns can result in wage compression being the optimal incentive schedule, if, for instance, differential pay has mainly detrimental effects on productivity; these concerns can also lead to different wage structures across industries and skill levels, depending on the type of tasks required in different industries and the ease of wage comparisons; lastly, comparisons of differences in pay may also contribute to unemployment if differential pay considerations affect labor supply.

According to standard economic theory, a person deciding to accept a job or exert effort on the job balances marginal cost and benefit (pay). Awareness of relative pay that confers no additional information should not be a factor in those decisions. Based on these ideas, companies often use strong competitive incentives and differential pay.

Nevertheless, individuals are generally affected by relative thinking (status is an excellent example), and in the labor market this means that awareness of relative pay—whether relative to one's pay in the past or to others' pay—may matter in an important way. For instance, past wages are thought to influence reservation wages, and, therefore, unemployment (Summers 1986, Feldstein and Poterba 1984); whereas pay cuts are thought to dampen morale and, therefore, productivity (Bewley 1999).

In spite of the suggestive evidence, it is difficult to find a direct causal relationship that answers the question of whether relative pay matters for labor supply. Other relevant questions that are likewise important, yet difficult to answer directly include the following: Does relative pay affect exertion of effort on the job? Does awareness of low relative pay motivate workers to work harder

to get ahead, or does it discourage their efforts? Does awareness of high relative pay lead workers to reciprocate by working harder? A collection of new studies, summarized below, provides direct evidence and answers to these questions, to some extent. The paper is organized as follows: Section 2 summarizes the evidence on the effect of relative pay awareness on labor supply; Section 3 presents evidence on the effect of relative pay awareness on effort, and Section 4 presents results suggesting that explaining differential pay is important. Section 5 discusses the limitations and gaps in the literature, and Section 6 concludes with some policy implications.

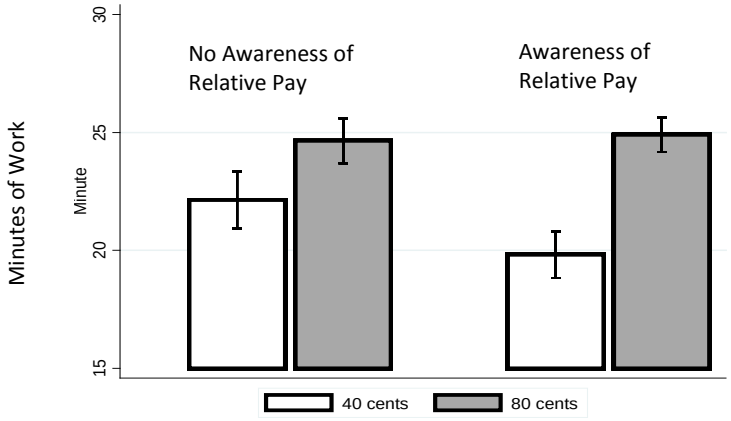
2. Relative Pay and Labor Supply

Lab, field, and empirical work results show that relative pay does affect labor supply.[1] Specifically, it affects those who are compared unfavorably, reducing their supply, while having no effect on those who are compared favorably.

In the lab, Bracha et al. (2015) test the hypothesis that, other things being equal, making a given pay rate high (low) relative to other pay levels will increase (decrease) labor supply. Participants were given the option to choose how much to work on a given task for a piece-rate pay level that is either high or low. In one condition, participants were aware of only one pay rate—theirs—and in the second condition participants were aware of two piece-rate levels—theirs and the other one. The results show that relative pay comparisons do affect labor supply: when participants were aware of the differential pay, lower-paid individuals supplied significantly less work time relative to higher-paid individuals, and significantly less work time than when they were unaware of the higher pay rate. Those who earned the higher rate, however, were not affected by the relative pay information—see Figure 1. Breza et al. (2015) find similar results in a field experiment in India. They use a natural setting of low-skilled manufacturing teams, where team members are the obvious reference group. The authors randomly assigned teams to receive either equal or differential pay, and find that in teams with differential pay, those who earned less than their peers were less likely to show up to work.

[1] Labor supply is defined in this brief as the extensive margin—that is, the decision of whether to work at all and, if so, how much to work—as opposed to the decision of how much effort to exert on the job, which is the intensive margin and is treated separately.

Figure 1: Labor Supply and Awareness of Relative Pay



This result is also found in empirical work. Using survey data, Card et al. (2012) find that job satisfaction declines and the likelihood of quitting increases among University of California employees who are aware of being paid less than their peers. Interestingly, there was no analogous effect on employees who were aware of being paid more than their peers. While this is only suggestive, Dube et al. (2015) complement this result with actual quitting data from a large retail company, where differential pay followed a pay *raise*. They find that a decision to increase salaries for all employees in a way that resulted in differential pay among peers who previously were paid 1 cent apart, led to a higher likelihood of quitting among those who fared unfavorably.

While these results focus on interpersonal relative pay—that is, pay relative to others' pay—Bracha et al. (2015) also provide evidence that past pay has a similar effect. They use intrapersonal comparisons by offering participants different pay rates on different occasions for similar tasks, and find that the individuals who were offered more than before were most likely show up to work; whereas, individuals who were offered less than before were the least likely.

3. Relative Pay and Effort

Relative pay also affects effort on the job. Economists often think of effort as a gift-exchange: the employer gifts the worker with good pay and the worker reciprocates with high effort level. Several lab experiments design environments to mimic this idea, and do indeed find that workers select high effort for high pay (for example, see Fehr et al. 1993). In the context of relative pay, the

question is whether differential pay would affect this reciprocal relationship: would awareness of differential pay make the highly paid workers feel obligated to exert even more effort, and lower paid workers to retaliate with low effort levels?

In two lab experiments that mimic the gift-exchange environment, where workers are identical but receive differential pay, Clark et al. (2010), and Gachter and Thoni (2010) find that a lower wage does indeed lead to lower effort selection. On the other hand, getting a higher wage than others does not lead to greater effort. This result is supported by survey evidence indicating that workers' income rank in their reference group's income distribution correlates positively with the assertion that they are "…willing to work harder than I have to in order to help the firm or organization I work for to succeed" (Clark et al. 2010).

While this lab result can be criticized since the gift-exchange setting measures effort by a number selection, Greiner et al. (2011) show that this pattern also emerges in a real-effort task environment. In their lab experiment, participants were paid a piece-rate and were randomly selected to get a pay increase or a pay cut. When participants were aware of the differential pay, individuals who received a pay cut reduced their effort, whereas there was no effect on effort of those who received a pay raise. More-recent field experiments find the same pattern and add to it: Cohn et al. (2014) show that the effect holds when relative pay is relative to the pay of others and also when it is relative to past pay. Specifically, the authors recruited workers to distribute promotion cards in pairs. After an initial phase, some pairs received the same wage as before, some had one worker's pay cut, and in some pairs both received a pay cut. A decrease in pay relative to the past led to a reduction in performance, and a decrease in pay compared with others' pay led to a further reduction by those who compared unfavorably. There was no effect on those who were in a differential pay condition and earned more than their peers. Breza et al. (2015), mentioned previously, show that, in their settings of manufacturing teams in India, differential pay not only causes individuals who earn less than their peers to be less likely to show up to work, but when they do show up, their productivity is lower. However, they find no effect on productivity of receiving higher pay. Finally, the same results emerge in a field experiment using the online platform TaskRabbit (Cullen and Pakzad-Hurson 2016). This is

important, as the wage at TaskRabbit is not set by the employer; but rather, workers bid their asking price for the job. Cullen and Pakzad-Hurson find that individuals who learn that they are paid less than others for the same job exert less effort, as captured by quality or time to complete their work. No effect was found on those who earned more than their peers.

4. The Effect of Providing a Reason for Differential Pay

While the results may strike one as intuitively true, in many cases workers passively accept differential pay or pay cuts. Indeed, there are two experimental studies that do not find any detrimental effect of relative pay on effort. Charness and Kuhn (2007) and Bolton and Werner (2016), for instance, set a gift-exchange environment where each employer is matched with two workers who differ in their productivity. Both studies find that employers use differential pay, and that in these settings neither the workers who are paid less nor those who earn more than their peer change their efforts in response.

The key difference in these settings is that it was common knowledge that workers are of different productivities. Differential productivities may therefore serve as an acceptable explanation for differential pay. This is consistent with other findings: Bracha et al. (2015) show that when participants in their lab experiment were given a reason for the differential pay, even if the reason was irrelevant to the task (evaluation of a short essay), the negative effect of relative pay disappeared. When the evaluation procedure of the essay was revealed, and therefore it became clear that it was random, the detrimental effect of the relative pay on labor supply re-emerged, due to those who earned less. Likewise, Breza et al. (2015) find that when there was a clear productivity differential in the manufacturing teams in India, the detrimental effect on productivity and labor supply of receiving lower pay was completely offset. And in a gift-exchange setting, Gachter and Thoni (2010) find that intentions matter—when wage differentials were not picked by the employer, the negative effect of differential pay on effort disappeared.

5. Limitations and Gaps

The findings across studies suggest that relative pay, at least unexplained relative pay, has a potentially negative effect on both the extensive margin—labor supply—and the intensive

margin—effort on the job. Yet, most studies focus on one margin only—labor supply *or* effort provision. In gift-exchange settings, for instance, workers decide on effort, and it is therefore the only way for them to express their frustration about relative pay. Dube et al. (2015) and Card et al. (2012), in contrast, focus on quitting intentions or actual rates, that is, labor supply.

While in a few experiments awareness of relative pay had the potential to affect both margins, in effect the settings of these experiments were more suitable for testing one dimension only. For instance, in Bracha et al. (2015), payment was based on a piece rate and there was no employer-employee relationship involved when participants decided to work; thus, the workers' efforts benefited only themselves. Hence, in that setting one's frustration is likely to be expressed on the extensive rather than the intensive margin, and indeed the authors found a detrimental effect of relative pay on labor supply, but no effect on productivity. In two field experiments—one by Cullen and Pakzad-Hurson (2016) at TaskRabbit and the second by Cohn et al. (2014) distributing promotion cards—while the focus was performance, workers could, in principle, quit. But none actually did. Examining the settings of these experiments closely, both used very short-term work engagements (between an hour and a few hours), and workers learned of the differential pay only after accepting the gig. This made it natural to respond to relative pay on the intensive rather than the extensive margin. Furthermore, in Cullen and Pakzad-Hurson (2016) workers bid for work, which likely made workers feel obligated to complete the work they were hired to perform, leaving productivity as the only channel through which they could react to the new awareness of their relative pay situation.

Breza et al. (2015) is perhaps the only study where a natural reaction to awareness of differential pay could be on both fronts: labor supply and effort on the job. While those authors examined a temporary work engagement (it was a month-long engagement), wages were based on a flat daily fee and were set by the employer. This study does find detrimental effects of awareness of differential pay on both margins—labor supply and effort on the job.

Given that there is only one study in which responding to awareness of relative pay is natural on both margins, more research is needed to fully understand how the effects of relative pay manifest themselves in the labor market—on the extensive margin, the intensive margin, or both.

It is also important to note that all recent studies focus on very low-skill tasks. Hence, to find out whether the effect found translates into other settings with more-skilled labor, further studies are needed using different environments, different industries, and with tasks that are more diverse.

6. Summary and Policy Implications

The evidence suggests that awareness of relative pay can negatively affect workers' decisions relevant to the labor market, such as labor supply and on-the-job effort. The effect stems from those whose pay compares unfavorably—whether compared with others' pay or with their own past pay—leading them to supply less labor and exert less effort.

The potential negative effects of relative pay and the conditions under which we find them are clearly important to consider when designing workers' incentives, especially differential pay, and when thinking of unemployment in a time of recession.

One of the conditions that matter and should be considered is the workers' awareness, and/or the reason for relative pay. Workers seem to accept lower relative pay when there is even a weak acceptable explanation for it. Hence, strong differential pay may be effective in environments where productivity differences, past evaluations, or perhaps tenure at the firm, are all obvious or when workers are unlikely to communicate with one another. On the other hand, in environments where workers work in close proximity and are similar in many respects, awareness of relative pay may backfire.

Relative pay also has implications for unemployment, as past pay has been shown to affect labor supply. During the Great Recession, for instance, a majority of work loss was concentrated in the construction industry, where the weekly wage is higher than in industries to which the unemployed could likely switch, such as transportation and hospitality. Although this idea demands further research, relative pay may be part of the explanation of the prolonged unemployment spells workers went through in the recent recession. Likewise, if differential pay across workers is a factor in reducing labor supply, it may also contribute to unemployment. Unlike the effect of current pay relative to past pay, the effect of differential pay on

unemployment may depend on the observability of pay across workers and the extent of the difference across employees (wage compression).

While further research is needed, the evidence is quite convincing that awareness of relative pay—both relative to the pay of other workers and relative to past pay—influences labor-relevant decisions, and that to alleviate its potentially negative consequences, explaining the need for pay cuts in times of recession or providing convincing reasons for adopting differential pay may be beneficial.

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