

# Reference Points and Bonus Payments – Field Evidence

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## Abstract

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## 1 Summary

We analyze the impact of reference points both on job satisfaction and performance with the example of a bonus system for executives of a world-wide operating company. The connection of survey, compensation and performance data on the individual level enables us to assess economic implications of reference points on job satisfaction and also on performance. In particular, the implemented system has the advantage that it provides a clear reference point for the managers to evaluate their bonus payments.

We find that - in line with loss aversion and inequality aversion - negative deviations from reference points have significant detrimental effects on reported job satisfaction while the impact of positive markups is nil. Furthermore, lack of transparency mitigates the importance of reference points, and spot bonuses have a stronger effect on satisfaction than regular bonus payments even though their economic relevance for the managers is much smaller. With respect to performance, we find that violations of managers' reference points affect the corresponding supervisor performance negatively. This result is robust against alternative specifications of reference point violation, evaluation behavior and team composition. In the following, we present related literature and provide a short description of the data and the compensation system. Finally, we briefly discuss our results.

## 2 Related Literature

In an often-cited survey study of more than 300 US companies, Bewley (1999) concludes that "within a company, pay inequity offends (indeed, sometimes outrages) employees and destroys trust". We provide empirical evidence from company data that reference points influence employees' perceptions of compensation fairness and affect both job satisfaction and performance.

The importance of relative comparisons is well established in happiness research: Subjective well-being and reported life satisfaction are highly related to relative wealth positions (for economic applications of these phenomena see Frank & Sunstein (2000) and Clark, Frijters and Shields (2007)). There is also a growing empirical and experimental literature suggesting an impact of relative comparisons on satisfaction and (real or experimental) per-

formance of subjects in labor market environments (see Pfeffer & Langton (1993), Brown et al. (2007) and Torgler et al. (2008) for empirical studies and Greenberg (1988) and Clark et al. (2006) for experiments). Generally, these studies document detrimental effects of wage/payout dispersion or status inequalities. This effect is usually driven by the negative reactions of persons in inferior positions.

In economic models, the impact of relative positions have been incorporated in various ways. Akerlof & Yellen (1990) proposed a negative relationship between a worker's effort and her wage relative to a visualized 'fair' wage. If realized wages are lower than the wages perceived as fair, effort exertion of employees is undermined. Moreover, the existence of positional concerns among workers, i.e. the dependency of utility on one's rank in a reference population, may lead to wage compression in firms (see Frank (1984*a*), Frank (1984*b*)).

The importance of relative payoffs in a labor market environment can be motivated also by theories of inequality aversion (Bolton & Ockenfels (2000) and Fehr & Schmidt (1999)). These models assume that utility or motivation does not depend solely on absolute payoffs of a person, but also on her payoff standing relative to a social reference point or to other persons.

Finally, theories of loss aversion play a role in the context of our study. Loss aversion postulates that utility is evaluated relative to a reference point. Losses, i.e. negative deviations from a given reference point, decrease utility stronger than same-sized positive deviations increase utility (see Kahneman & Tversky (1979) and (1991) and Kahneman, Knetsch and Thaler (1991)).

The application of this concept to labor market environments is, however, difficult. For given incentive schemes, there are multiple reference points that could influence subjects. For this reason, theoretical and empirical evidence in this context is scarce. Köszegi & Rabin (2006) proposed a model of reference-dependent preferences in which reference points are formed on the basis of rational expectations and apply this concept among other things to labor supply decisions. In an empirical study, Mas (2006) showed that police performance in the US was sensitive to pay rises compared to reference points set by final offer arbitrations. If arbitrators in a compensation dispute decided in a way unfavorable to the demand of the police force, the number of crimes cleared decreased afterwards.

To our knowledge, there is no study investigating the impact of reference

points for the functioning of incentive schemes. In business practise, substantial importance is attached to the design of variable pay systems. There is a large literature on the optimal design of incentive schemes (see Prendergast (1999) and Englmaier (2004) for surveys of incentive theories with and without consideration of social preferences). Empirical studies show a generally positive impact of variable pay on performance (see Lazear (2000) and Bandiera et al. (2007)). However, we are not aware of an empirical test of the importance of reference points for the success of variable compensation systems.

### **3 Employee Survey and Compensation Data**

We study if social preferences and reference points affect employees' perceptions of payment systems. These questions are addressed using survey and compensation data from managers of a multinational company (>100,000 employees). In cooperation with the company, we conducted a survey among managers located in Germany (autumn 2007) and the United States (summer 2008). The managers are subject to the same system of variable compensation, however, the handling of the system differs in small but important details. Some of these differences enable us to validate the impact of reference points on satisfaction and performance. Altogether 4,997 executives took part in the survey (3,122 in Germany and 1,875 in the US).

The bonus system analyzed in our paper is applied to all executive managers in the company except for sales representatives. Individual bonus budgets are determined by linking company performance and fixed salary of a manager. Each supervisor receives the sum of individual bonus budgets to distribute among the managers in her department. Then, she decides on personal payout percentages (markups on or reduction below 100% bonus budget). As bonus payments are linked to a subjective individual performance rating of a person, the budgeting of bonus funds creates externalities: In order to assign one manager a bonus payment >100% of her budget, a supervisor must assign another manager a bonus <100%.

In general, the economic relevance of bonus payments is roughly comparable between Germany and the US, as average payments are similar throughout the years in focus (2004-2006 for Germany and 2004-2007 for the United States). However, the communication of the system differs in one

crucial aspect that enables us to assess the economic impact of reference points. In Germany, managers receive information highlighting their personal bonus payout percentages together with the notice about their yearly bonus payments. Contrary, when US managers are sent the notice about their bonuses, only absolute amounts are communicated.

In addition to regular bonus payments, supervisors can allocate individual spot awards to employees, for example for exceptional performance in particular projects. However, there exist no formal allocation rules, and the economic significance of these payments is low compared to the regular bonuses.

## 4 Description of the Results

### 4.1 Reference Points and Job Satisfaction

Our proxy variable for job satisfaction is the answer to the question: „I am very satisfied with my job.“ Subjects could respond on a scale from 1 (totally disagree) to 7 (fully agree), so that increasing values of the score reflect higher satisfaction. The distributions of answers in the US and Germany are similar. To analyze the impact of compensation instruments on individual job satisfaction, we estimate regression models with job satisfaction as the dependent variable. In neither country we find a significant impact of the absolute bonus payments. Contrary, although the amounts are much lower, spot bonuses are significantly associated with a higher satisfaction score in case of Germany. Finally, a person’s performance rating is strongly positively correlated with job satisfaction in both country samples indicating the positive impacts of good ratings for further salary increases and career opportunities<sup>1</sup>.

Given that absolute bonus payments do not matter for satisfaction, we investigate if relative payments have an effect. Our result confirm patterns of loss aversion in the case of Germany and are also consistent with inequality aversion. Markups on 100% do not increase self reported satisfaction significantly. However, decreases below 100% have a significant negative effect on satisfaction levels. The farther away a person’s payout percentage is from the threshold of 100%, the lower is her estimated job satisfaction. The ref-

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<sup>1</sup>Generally we find a positive correlation between personal performance ratings and promotions to higher hierarchy levels.

erence point effect remains robust, if we control for example for the effect of performance ratings. Contrary, the models for US managers do not provide evidence for a sensitivity regarding the reference point. In all specifications, the respective coefficients are far from being significant. This result can be explained by the lower level of transparency concerning bonus payouts. As managers do not focus on their bonus budgets, negative deviations from this threshold do not significantly influence their job satisfaction.

## 4.2 Reference Points and Performance

In the next step, we analyze the determinants of performance in our sample. We are especially interested in the effect of deviations from the reference point of 100% bonus budget on incentives for good performance. To measure performance, we rely on proxy measures: Functional areas of the managers in our company sample are very diverse, and in most cases direct measures are not available. Therefore, we assume that a supervisor's rating in a given year is correlated with the effort provided by her subordinates in the preceding year.

We use ordered probit models as well as linear models with fixed effects on the level of the supervisors. The models show that - controlling for background and compensation data as well as for evaluation behavior of the supervisor - reference point violations negatively affect performance in Germany. The share of managers rated 'average' and receiving less than 100% bonus is negatively associated with a corresponding supervisor's performance. Thus, the more employees are reduced below the reference point with their bonus payments, the lower is the estimated performance of the supervisor in the subsequent period. This effect is found also in fixed effects models. Moreover, the described results remain robust in alternative specifications for team composition and reference point violations. Among other things, we include the average bonus payout percentage per supervisor as an alternative to the share of 'average' managers below 100%. The coefficient is positive and significant, indicating that the stronger is the reduction of this employee group, the lower are the incentives.

Similar to the models for job satisfaction, we do not find any effect of reference points in the US data. Here, reference points do not play a significant role for incentives, presumably because they are not triggered by the system communication.