Monetary Reference Points of Managers

March 2012

VERY PRELIMINARY VERSION

PLEASE DO NOT QUOTE

Authors:

Christian GRUND, University of Duisburg-Essen, Mercator School of Management, Lothar-strasse 65, 47057 Duisburg, Germany, E-Mail: christian.grund@uni-due.de, Tel: ++49 203 379 4369

Johannes MARTIN, University of Duisburg-Essen, Mercator School of Management, Lothar-strasse 65, 47057 Duisburg, Germany, E-Mail: johannes.martin@uni-due.de, Tel: ++49 203 379 4312

Monetary Reference Points of Managers

Abstract

We assemble two reference point based concepts of utility in our empirical study: the own status quo and social comparisons. We explore the relative relevance of these concepts for total compensation as well as for different parts of the compensation package of managers. Making use of a unique panel data set of managers of the German chemical sector, we find that social comparisons of compensation indeed affect reported job satisfaction. Managers compare their total compensation (and fixed salary) with others in the chemical sector and report lower satisfaction scores when they earn less than similar managers. There is less evidence for the relevance of status quo preferences.

JEL-Codes: M5, D03, J30, J28

Keywords: Compensation, Job satisfaction, Reference points, Social comparisons, Status quo preferences

1 Introduction

It is now more and more established in (behavioral) personnel economics that in many situations individuals do not care exclusively for their own outcome, but also take certain reference points into account. These possible reference points include the own hitherto status quo or social comparisons with peers.

Income comparisons among employees played for a long time a minor role in the economic literature (see Drakopoulos (2011) for an overview over the history of earnings comparisons in economics). However, first theoretical foundations of the own hitherto status quo as reference point trace back to the contributions of Duesenberry (1949) and Markowitz (1952). They focused especially on consumption decisions. Prospect Theory (Kahneman & Tversky 1979, Tversky & Kahneman 1991) enhanced these approaches: Individuals evaluate a specific amount of money or other goods not only with respect to its absolute value, but also relative to a certain reference point. In this context, it is often assumed that negative deviations from this reference point lead to a higher increment of disutility than positive deviations in the same size lead to an increment of utility (loss aversion). Easterlin (1995, 2001) explains these status quo preferences with increased aspiration levels over time.

In the context of social comparisons, first theoretical considerations are the Social Comparison Theory of Festinger (1954) and the Equity Theory of Adams (1963). It is argued that individuals compare themselves with similar persons (neighbours or colleagues, for instance). These comparisons may then affect perceived utility and behaviour. Akerlof (1984) and Akerlof & Yellen (1990) apply these arguments to considerations in the economics literature and argue that effort choice in employment relationships depend on fairness considerations. Based on experimental evidence, Fehr & Schmidt (1999) as well as Bolton & Ockenfels (2000) offer specific utility functions, which take individuals' inequality aversion into account. In contrast,

Frank (1985) argues that individuals have certain status preferences perceiving a benefit from a higher status (with respect to wages, for instance) than comparable persons. Besides, Hirschman & Rothschild (1973) describes a tunnel effect, i.e. higher wages of reference persons could reflect a signal for future own wages.

If the two types of reference points matter, individuals acting in a role as an employee may then take their own wage of the previous period or the wage of other employees into consideration in order to evaluate their own current income.

Previous empirical contributions either focus on the status quo *or* social comparisons of individuals. Some papers examine the impact on human behaviour in terms of effort, performance or labour supply (e.g. Camerer et al. 1997, Farber 2005 and 2008, Mas 2006, Mas & Moretti 2009, Ockenfels et al. 2010). Other papers analyse more directly, whether monetary reference points affect subjective well-being or job satisfaction. Hereby, one strand of the literature gears to the previous status quo as possible reference point. Clark (1999) analyses employee data of two waves of the British Household Panel Survey (BHPS). In his cross-sectional investigation, he finds a strong positive correlation between the change in hourly pay and job satisfaction. Grund & Sliwka (2007) confirm this finding with panel data of 19 waves of the German Socio-Economic Panel (GSOEP). The results hold true for highly skilled white-collar workers in particular.

Other contributions analyse the relevance of social comparisons, i.e. the comparison with peers. The empirical strategy varies across studies. The seminal paper of Clark & Oswald (1996) makes use of the 1991 wave of the BHPS. In order to calculate the reference wage, they estimate a Mincer-type wage regression with a bunch of wage determinants and predict the expected wage for all individuals. Hence, the reference point indicates the wage an employee with given individual and firm characteristics can expect in the labor market on aver-

age. They find a significantly negative correlation between job satisfaction and this reference point, given a certain own wage level. Ferrer-i-Carbonell (2005) defines the reference point as the average income of individuals living in the same region with the same education and the same age. She uses panel data of the German Socio Economic Panel (GSOEP) shows that the more individuals earn in comparison to their reference groups, the more satisfied they are. In addition, this effect is asymmetric, which means that individuals with an income below the reference point are more dissatisfied than individuals with an income above the reference point in the same amount are satisfied. Clark et al. (2009a) stick to income comparisons with the nearby neighbourhood. Using administrative data matched with eight waves of the Danish European Community Household Panel (ECHP), they find a positive effect of the richness of the neighbourhood on the economic satisfaction of individuals. However, the relative position within the neighbourhood is important too: The higher individuals are located in the income distribution, the more satisfied they are. FritzRoy et al. (2011) compare the relevance of social comparisons in Germany and in Great Britain using panel data of the GSOEP and the BHPS. They define the reference group as individuals with same age, education, gender and living in the same region. Interestingly, they find an age-dependent impact of the reference income for Germany: Whereas life satisfaction is negatively correlated with the average income of the comparison group for those over 45, this correlation is positive for those under 45. They interpret this finding as a confirmation of Hirschman´s tunnel effect that individuals interpret higher wages of peers as signals for possible own wages in the future. For Great Britain, the satisfaction effect of the reference income is negative for all age groups.

Some few studies analyse social comparisons on the level of firms. Brown et al. (2008) use data of the British Workplace Employee Relations Survey of 1998 and focus on employees. They operationalize monetary reference points by computing the individual wage rank within the firm. They find a highly significant and positive correlation of the wage rank with differ-

ent measures of satisfaction. Moreover, the effect of the relative income position seems to be stronger as of the absolute pay itself. Clark et al. (2009b) match (as in Clark et. al (2009a), too) waves of the Danish ECHP with administrative data. The results show that own earnings matter for job satisfaction, but also average earnings within the establishment do: the higher the mean pay in their firm is, the more satisfied workers are. The authors argue in this context that the definition of the reference group is very important for the direction of the effect. When the wages of other could be my own future earnings (as with respect to wages of co-workers), than the effect is rather positive – wages exert a signal. However, when comparison earnings are not reachable for me, I interpret those as an indication of a higher social status of others and hence the effect should be negative. Card et al. (2010) conduct a field experiment with about 6,000 employees at the University of California. Within this experiment, a treatment group of employees gets information about a new website where wages of University employees are listed. Other employees in the control group are not informed. They find a clear result: The information of the treatment group exerts a negative effect on the satisfaction of individuals who are paid the median wage of their unit and occupation, i.e. workers with comparable tasks. There is no effect, however, for people who are paid over the median. One conclusion by the authors is that it could be better for employers to keep secrecy regarding the payments of their employees. The possibly closest contribution with respect to our data is Ockenfels et al. (2010). They compare executives of one multinational firm in two plants in Germany and the U.S. As they have information about the achievement of individual targets of the managers, they define the reference point as a bonus percentage of 100 percent. The bonus payment depends on how good managers have fulfilled their targets. Thereby, a value of 100 percent means that the manager fully meets the expectations of the supervisor. Furthermore, the bonus budget of supervisors is restricted which implies that they have to cut the payment of one or more managers if they want to pay other managers a higher bonus. In con-

sequence, bonus percentages under the reference point could be understood as negative reference point violations. In the German plant, job satisfaction of managers is significantly reduced if they fall below the reference point, but there is no effect on satisfaction of managers with bonus percentages over 100 percent. In the U.S., there is no significant effect. The authors explain this finding with the communication policy of the firm. American managers get no information about their bonus percentages, whereas German managers are fully informed. Hence, the results of this study suggest too that firms could be better off when keeping secrecy about earnings.

In conclusion, the results imply that individuals perceive a lower utility in most cases when their wage is below a certain social reference wage. But the effects of reference points depend on the selection of the reference person or group. However, all of these studies analyse one possible reference point (either the previous status quo or social comparisons) and one measure of monetary outcome (fixed salaries, bonus, total compensation) only. It is therefore not possible to evaluate the relative relevance of the two concepts up to now. In contrast to previous work that focused on one possible reference point, we assemble both concepts and explore their relative relevance. We address the following questions in particular:

(1) To what extent is job satisfaction affected by deviations from the hitherto compensation (status quo) and by differences from others´ compensation (social comparison)?

(2) Are there differences between wage components?

(3) Are there differences between comparisons on the firm level and on the industry level?

We make use of a unique panel dataset with rich information on income components, work situation and socio-demographics of managers of the German chemical sector. We measure the perceived utility from a job with the reported job satisfaction. In contrast to previous

work, we examine not only one but both of the two types of reference points. First, we have longitudinal information about the manager´s income so that we are able to investigate the relevance of possible *deviations of the hitherto status quo*. Second, the data includes information about the firm and the hierarchical level of the managers and, thus, allows us to define certain reference groups that managers could compare their income with. We hereby distinguish between the market and the firm level. Ex ante it is not clear, whether employees compare themselves with colleagues of the same firm or also with employees in similar jobs of other firms. Evidence may differ across wage components, too. We offer a separate examination for total compensation as well as for fixed salaries and bonus payments..

The remainder of the paper is structured as follows: In chapter 2, we describe our data and our variables. Afterwards, we present our empirical strategy and our results in chapter 3. Finally, chapter 4 discusses the results and concludes.

2 Data and Variables

We can make use of a unique panel data set of highly qualified professionals and executives of the German chemical industry. We conduct a corresponding annual salary survey in collaboration with the German association of executive staff of the chemical industry (Verband angestellter Akademiker und leitender Angestellter der Chemischen Industrie e.V. (VAA)). According to VAA, our sample is representative for the respective employees of the chemical sector. Individuals are asked about their current job next to some demographics and their previous occupational career. In particular, we have detailed information on all components of their compensation such as fixed salaries and bonus payments as well as other integral parts

such as exercised stock options, inventors' gratuities or jubilee payments. Grund & Kräkel (forthcoming) provide some more information of the data.

We can make use of the first three waves of this survey of the years 2009 to 2011. Compensation data are collected in retrospect so that the data cover the period from 2008 to 2010. We restrict our sample to fulltime employees in West German plants who have a university degree in natural science or engineering. The VAA negotiates an annual collective agreement with the employers concerning minimum wage levels and working conditions. This contract is only valid for such managers with a university degree in natural sciences and engineering, who account for 0.88 of our sample. Since we also want to address the role of certain wage components, fixed salary and bonus payments in particular, only employees with a bonus contract are considered. Due to these restrictions, we have got a sample size of 11.077 observations over the three year period. Each year we have information of about 3.700 managers. We can follow individuals over time and have got an unbalanced panel.

We explore the role of compensation for the perceived utility from work. We therefore use reported job satisfaction of managers as its proxy (see already Freeman (1978) for reasoning that job satisfaction is an economically highly relevant variable). General job satisfaction is surveyed with the question "How satisfied are you with your job?" on an 11-digit scale from 0 (totally unhappy) to 10 (totally happy). The average reported job satisfaction is 6.85 with the median and mode at 8 (Table 1 and Figure 1 in the Appendix). The distribution does not differ very much to the whole group of employees in Germany (see Grund & Sliwka 2007) for corresponding evidence).

We have detailed information on individuals' compensation. Bonus payments are prevalent for managers in the sector. Some employees also report other additional monetary parts of compensation such as exercised stock (options) or gratuities for inventions next to their fixed

salary. The average annual total compensation of the managers in our sample amounts to almost € 120.000. The main part (80 %) of compensation is assigned to fixed salaries and 15 % account for bonus payments (see Table 1). The observation period covers an economically successful year of the German chemical sector (2008) and the subsequent economic crisis. The fraction of bonus payments on total compensation in our sample decreases only slightly from 0.17 in the year 2008 to 0.14 in 2010, though.

We explore the role of monetary reference points next to the own compensation of the current period. We use reported compensation of the previous year as our measure for the hitherto status quo. Doing this, we lose a considerable number of observations (in particular those of the first wave of our panel). Additionally we compute social comparison wages by estimating Mincer type wage regressions and using the results for calculating predicted wages for individuals. A manager with certain characteristics – we control for the level of the hierarchy, work experience and firm size – earns on average the predicted wage. We compute these comparison wages at two levels of the analysis. First, we refer to the market level and use all observations of our sample. Second, we run the wage regressions on the firm level arguing that colleagues may be the relevant reference group. Doing this, we can only make use of firms with a considerable number of observations. We restrict our analysis to ten large firms. Some more detailed information on these reference wages are given at the corresponding subsections of the empirical investigation below.

We make use of a bunch of control variables in our regression analysis on job satisfaction of the following section. These control variables include socio-demographic characteristics such as sex, being in a relationship, having children and experience as well as job and firm level factors, which include the distance from home to the workplace (in km), tenure (in years),

firm size (8 dummies) and level of the hierarchy (4 dummies, with level 1 representing top management positions).

Table 1 about here

3 Empirical Strategy and Results

3.1 Status Quo Preferences

We argued above that the salary or certain wage components of the previous year may act as reference points in the sense of a hitherto status quo. We will explore the role of fixed salary and bonus payments next to total monetary compensation. Then the actual salary and also deviations from the previous year may have an effect on job satisfaction (see Clark & Oswald 1996 as well as Grund & Sliwka 2007 for previous evidence).

Individual reported job satisfaction in the actual year acts as the dependent variable. Because of its ordinale scale, ordinal probit estimates would be one possibility. We stick to linear regressions so that the effect size of the results can be interpreted more easily. Job satisfaction is measured on an 11-digit scale so that there are not to few different values. We apply random effects models since we have only three years and an overlap of individuals from year to year of about 0.6. The qualitative results do not differ between linear and ordered probit model estimates. The wage of the current year (t) and the previous year (t-1) act as the decisive independent variables. In a first step, we only insert the wage of the current period (model (1) of Table 2). Indeed, we find a significant relation between the wage and job satisfaction. Because of the structure of our data, we lose a considerable number of observations by including

the wage of the previous period. All observations of the first wave are dropped in particular. Model (2) of Table 2 is just a re-estimate of model (1) with the observations for which we have information for the wage of previous period. The sample size drops from about 11.000 to about 5.000. The results are robust with respect to this restriction. Models (3) and (4) show corresponding specifications with the fixed salary and the bonus payment instead of total compensation. Both are positively associated with job satisfaction. The size of the coefficients does not differ dramatically.

The results for the other independent (control) variables show that job satisfaction is positively related to firm size, being in a relationship and the level of the hierarchy, while it is negatively associated to the distance of the home to the workplace and experience.

Including the wage of the previous year, the following estimation applies:

$$\text{Job satisfaction}_t = \alpha + \beta \cdot \text{wage}_t + \gamma \cdot \text{wage}_{t-1} + \delta' X + \varepsilon. \quad (1)$$

The vector of the other independent variables is characterized by X. A simple transformation shows that the effect of wage increases is directly captured with this approach:

$$JS_t = \alpha + (\beta + \gamma) \cdot \text{wage}_t - \gamma \cdot (\text{wage}_t - \text{wage}_{t-1}) + \delta' X + \varepsilon. \quad (2)$$

Hence, evidence for status quo preferences would be revealed by a negative and significant estimate of γ. The results of estimations of equation (1) and (2) are equivalent in terms of the estimated coefficients α, β, γ, and δ. Model (5) shows that we do not find support status quo preferences concerning total compensation. The coefficient of the compensation of the previous year is not significant and its sign is positive instead of negative as expected. We do not find evidence with respect to changes in fixed salaries or bonus payments, either (model 6).

Table 2 about here

This approach is based on the assumption that the satisfaction effect of the previous status quo is equal for all managers, no matter whether they earn more or less than before. However, under the assumption of loss aversion, managers are supposed to evaluate wage decreases stronger than wage increases. Figure 2 illustrates this idea with two different curves. The dashed line represents the effect on job satisfaction in the absence of loss aversion which is the result of an estimation of equation (2). In contrast, the continuous curve with the kink in the origin stands for the situation under the assumption of loss aversion.

Figure 2 about here

To test this approach econometrically, we extend equation (2):

$$JS_t = \alpha + \beta \cdot wage_t + \gamma \cdot (wage_t - wage_{t-1}) + \delta \cdot (wage_t - wage_{t-1}) \cdot Decrease + \eta' X + \varepsilon. \quad (3)$$

Decrease represents a dummy which adopts the value 1 if the manager earns less than the year before. The evidence of loss aversion would be revealed by positive and significant coefficient δ, which would indicate the steeper slope of the curve below the origin in Figure 2. Note that, due to the interaction term, the coefficients of this equation are no more identical to the coefficients of equations (1) and (2). Table 3 shows the results for total compensation

(model 1) and fixed salaries and bonus payments (model 2). However, we do not find evidence for loss aversion, too.[1]

Table 3 about here

In the following subsection, we explore whether there is more evidence of the role of social comparisons for utility of work reported by job satisfaction.

3.2 Social Comparisons and Job Satisfaction

As mentioned above, we investigate the relevance of social comparisons on two different levels. On the one hand, managers may compare themselves with the whole labor market of the chemical industry. Wages within the sector are transparent to a certain extent, as the VAA publish an annual brochure including a bunch of analyses regarding the earnings of their members (based on the same dataset used in this paper). We think that managers have some possibilities to compare their wages with those of others. We operationalize the reference wage by the predicted wage managers would earn on average with their characteristics on the market. We estimate Mincer-type wage regressions for total compensation, fixed salary and bonus payments. As wages within the chemical industry differ considerably between the three years, we estimate separate cross-sectional OLS regressions by year. Within the estimation equation, we control for firm size, work experience and hierarchical level, as these are the

[1] However, there is a slightly significant and negative effect of the interaction term with respect to fixed salaries. In our data, only 7.5 percent of all managers suffer decreases in their fixed salaries from one year to another. These are mostly due to job or firm changes. Hence, the positive effect on job satisfaction is not supposed to be due to wage cuts, but rather because of positive developments in the work environment.

most important determinants of wages within the chemical industry.[2] In consequence, the predicted wage reflects the wages executives would earn on average with their individual firm size, work experience and hierarchical level in a given year.

Besides these social comparisons with other managers in the market, managers may compare their income with the income of their intra-firm colleagues. Our operationalization of the corresponding reference wage is similar as we also predict wages by running Mincer-type wage regressions. However, we thereby include only observations of the particular firm. Analogously, we run separate cross-sectional regressions for each of the three years. We control for work experience and hierarchical level. Hence, the predicted wage in this case reflects the income managers earn on average with their given work experience on their given level in their firm. Doing so, we can only focus on some bigger firms with sufficient observations in the single years so that we focus on the ten biggest firms.

We then include the predict wage in our estimation equation:

$$JS_t = \alpha + \beta \cdot \text{wage}_t + \gamma \cdot \text{wage}_{ref,\,t} + \delta' X + \varepsilon. \quad (4)$$

A simple transformation leads to a similar equation as in the case of status quo preferences:

$$JS_t = \alpha + (\beta + \gamma) \cdot \text{wage}_t - \gamma \cdot (\text{wage}_t - \text{wage}_{ref,\,t}) + \delta' X + \varepsilon. \quad (5)$$

Hence, γ indicates the relevance of social comparisons. Given a significant influence, a negative sign would indicate preferences for an own wage that is higher than that of the peers. Estimations of the models (4) and (5) would lead to equivalent results with respect to the estimated coefficients.

[2] The Adjusted R^2 of these OLS estimations reaches over 60 percent.

In all other respects, the estimations are identical to those presented in section 3.1 for status quo preferences. The results are shown in Table 4. In model (1) we include total compensation and the total reference compensation on the market level. The highly significant and negative sign indicates that the more managers earn relative to managers on the market, the higher is their job satisfaction. The effect of the own total compensation is highly significant too, but much smaller than that of the reference wage. Model (2) reveals the results for both fixed salary and bonus payments. The picture for fixed salary is similar to total compensation with a positive influence of the own wage and a negative effect of the reference wage. Regarding bonus payments, however, we get a positive and highly significant effect of the own bonus, but no significant influence of the reference bonus. The sign is even positive.

In model (3) and (4), we focus on intra-firm social comparisons. As mentioned above, we thereby concentrate on the ten biggest firms. However, we don´t get many significant results. Only the own fixed salary exert a significant influence on job satisfaction.

Table 4 about here

Similar to the situation of status quo preferences and loss aversion, there are also some hints that managers who earn less than their peer group are more influenced by the reference income than managers with an income above the reference wage are. One explanation could be the higher relevance of negative than positive inequality aversion (Fehr & Schmidt 1999). We define this case as *social loss aversion*. To test whether there is evidence for this assumption, we extend model 5:

$$JS_t = \alpha + \beta \cdot wage_t + \gamma \cdot (wage_t - wage_{ref,t}) + \delta \cdot (wage_t - wage_{ref,t}) \cdot Below + \eta' X + \varepsilon. \qquad (6)$$

Below is a dummy adopting the value 1 when the manager earns less than the respective reference income. Hence, a positive and significant coefficient δ would prove that the effect of the reference income is especially strong for managers with wage < $wage_{ref}$. Table 5 shows our results. There is evidence of social loss aversion regarding total compensation on both market and firm level as well as regarding bonus payments on the market level.

Table 5 about here

4 Conclusion

In the traditional view of economics, individuals are egoistic and exclusively care of their own income. However, several approaches in the field of behavioral economics suggest that workers also take certain monetary reference points into account when evaluating their income situation. Using a unique dataset of executives in the German chemical sector, we explore the relevance of two different possible reference points: the own wage from one year before (status quo preferences) and the wages of comparable managers (social comparisons). Job satisfaction (as a proxy for utility from work) is significantly correlated with the absolute value of total compensation, fixed salaries, and bonus payments. Though, we find no evidence for status quo preferences, i.e. wage payments from previous years seem to be not relevant for managers. However, we find highly significant effects with respect to social comparisons with other managers in the labor market, at least for total compensation and fixed salaries. The partial effects are even higher than those of the own wages. This effect is even stronger when executives earn less than the reference income. When we investigate social comparisons with co-workers in the same firm, however, we find less evidence associations to job satisfaction.

The analysis of subgroups with respect to sex is left for future research. Furthermore, instead of absolute wage differences, one may assess the impact of relative wage differences. Instead of estimated reference wages, ranks and percentiles may also be useful measures for reference incomes (see Brown et al. 2008). Finally, the synthesis of both reference point concepts is an exciting task for future research: It may well the case that managers compare their own wage increases to the wage increases of their co-workers in particular.

References

Adams, J. S. (1963): Toward an Understanding of Inequity. In: Journal of Abnormal and Social Psychology (67), 422-436.

Akerlof, G. A. (1984): Gift Exchange and Efficiency-Wage Theory: Four Views. In: American Economic Review (74), 79-83.

Akerlof, G. A.; Yellen, J. L. (1990): The Fair Wage-Effort Hypothesis and Unemployment. In: Quarterly Journal of Economics (105), 255-283.

Bolton G.E.; Ockenfels A. (2000): A Theory of Equity, Reciprocity, and Competition. In. American Economic Review 100:166-193.

Brown, G. D. A.; Gardner, J.; Oswald, A. J.; Qian, J. (2008): Does wage Rank Affect Employees Well-being? In: Industrial Relations 47, 355-389.

Camerer, C. F., Babcock, L., Loewenstein, G., Thaler, R. (1997): Labor Supply of New York City Cab Drivers: One Day at a Time. In: Quarterly Journal of Economics, 111, 408-41.

Card, D., Mas, A., Moretti, E., Saez, E. (2010): Inequality at Work: The Effect of Peer Salaries on Job Satisfaction. NBER Working Paper 16396.

Clark, A. E. (1999): Are Wages Habit-Forming? Evidence from Micro Data. In: Journal of Economic Behavior & Organization, 39, 179–200.

Clark, A. E., Kristensen, N., Westergård-Nielsen, N. (2009a): Economic Satisfaction and Income Rank in Small Neighbourhoods. In: Journal of European Economic Association, 7(2-3), 519-527.

Clark, A. E., Kristensen, N., Westergård-Nielsen, N. (2009b): Job Satisfaction and Co-Workers Wages: Status or Signal? In: Economic Journal 119, 430-447.

Clark, A. E.; Oswald, A. J. (1996): Satisfaction and Comparison Income. In: Journal of Public Economics, 61, 359–381.

Drakopoulos, S. A. (2011): The Neglect of Comparison Income: An Historical Perspective. In: The European Journal of the History of Economic Thought 18, 441-464.

Duesenberry, J. S. (1949): Income, Saving and the Theory of Consumer Behavior. Harvard University Press: Cambridge, MA.

Easterlin, R. A (1995): Will Raising the Incomes of All Increase the Happiness of All? In: Journal of Economic Behavior and Organization 27, 35-48.

Easterlin, R. A. (2001): Income and Happiness: Towards a Unified Theory. In: The Economic Journal 111, 465–484.

Farber, H. (2005): Is Tomorrow Another Day? The Labor Supply of New York City Cab Drivers. In: Journal of Political Economy 113 (February 2005), 46-82.

Farber, H. (2008): Reference-Dependent Preferences and Labor Supply: The Case of New York City Taxi Drivers. In: American Economic Review 98, 1069-1082.

Fehr, E., Schmidt, K. M. (1999): A Theory of Fairness, Competition and Cooperation. In: Quarterly Journal of Economics (114), 817-868.

Ferrer-i-Carbonell, A. (2005): Income and Well-Being: An Empirical Analysis of the Comparison Income Effect. In: Journal of Public Economics 89, 997-1019.

Festinger, L. (1954): A Theory of Social Comparison Processes. In: Human Relations 7, 117-40.

Frank, R.H. (1985): Choosing the Right Pond: Human Behavior and the Quest for Status. New York: Oxford University Press.

Freeman, R. B. (1978): Job Satisfaction as an Economic Variable. In: American Economic Review 68, 135-141.

FritzRoy, F. R., Nolan, M., Steinhardt, M. F. (2011): Age, Life Satisfaction, and Relative Income: Insights from the UK and Germany. IZA Discussion Paper No. 6045.

Grund, C., Kräkel, M. (2012): Bonus Payments, Hierarchy Levels and Tenure: Theoretical Considerations and Empirical Evidence. Forthcoming in: Schmalenbach Business Review (sbr, April 2012).

Grund, C., Sliwka, D. (2007): Reference Dependent Preferences and the Impact of Wage Increases on Job Satisfaction: Theory and Evidence. In: Journal of Institutional and Theoretical Economics 163, 313-335.

Hirschman, A. O., Rothschild, M. (1973): The Changing Tolerance for Income Inequality in the Course of Economic Development. In: Quarterly Journal of Economics 87(4), 544-566.

Kahneman, D., Tversky, A. (1979): Prospect Theory: An Analysis of Decision under Risk. In: Econometrica, 47, 263–291.

Markowitz, H. (1952): The Utility of Wealth. In: Journal of Political Economy 60, 151–158.

Mas, A. (2006): Pay, Reference Points, and Police Performance. In: Quarterly Journal of Economics, 121, 783-821.

Mas, A., Moretti, E. (2009): Peers at Work. In: American Economic Review, 99, 112-145.

Ockenfels, A.; Sliwka, D.; Werner, P. (2010): Bonus Payments and Reference Point Violations. IZA Discussion Paper No. 4795.

Tversky, A, Kahneman, D (1991): Loss Aversion in Riskless Choice: A Reference-Dependent Model. In: Quarterly Journal of Economics 106, 1039–1061.

Tables and figures

Figure 1: Histogram of Job Satisfaction

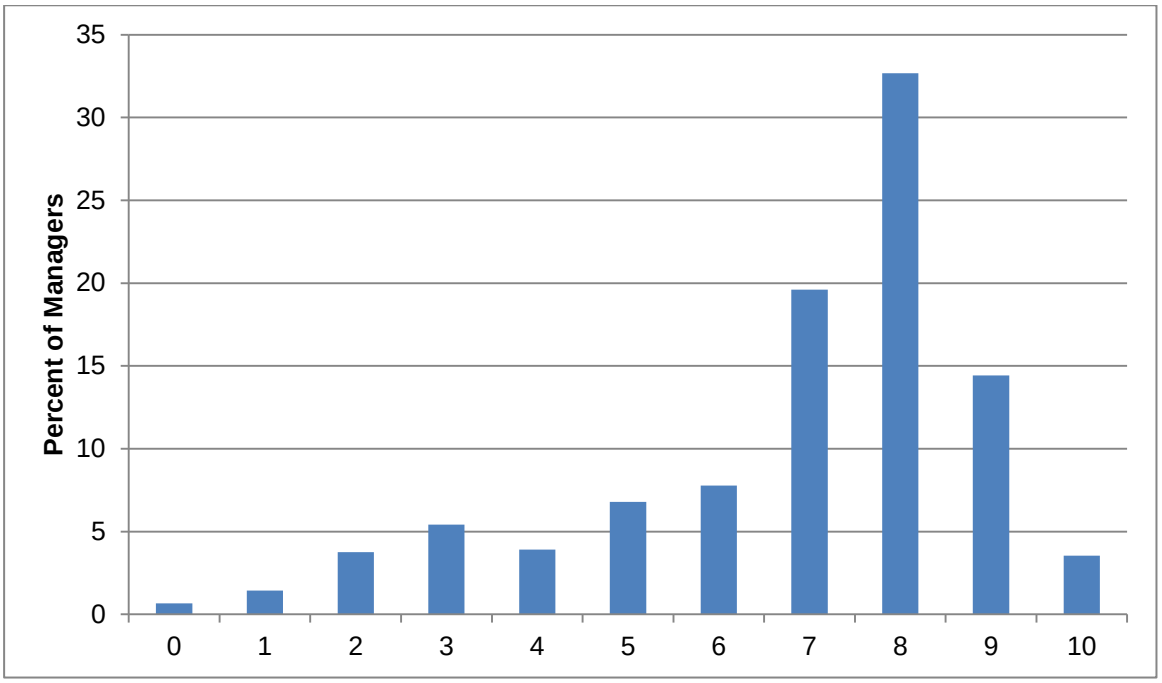

Table 1: Descriptive statistics

Variable	n	Mean	Standard deviation
Job satisfaction	11,077	6.85	2.13
Total Compensation in t (in 1,000 €)	11,077	118.81	47.79
Total Compensation in t-1 (in 1,000 €)	4,766	118.30	42.49
Fixed Salaries in t (in 1,000 €)	11,077	95.10	26.01
Fixed Salaries in t-1 (in 1,000 €)	4,766	90.30	24.82
Bonus Payments in t (in 1,000 €)	11,077	18.04	17.85
Bonus Payments in t-1 (in 1,000 €)	4,766	18.71	16.76
Female (dummy, 1=yes)	11,077	0.094	
Being in Relationship (dummy, 1=yes)	11,077	0.921	
Children in household (dummy, 1=yes)	11,077	0.664	
Distance to workplace (in km)	11,077	23.51	23.94
Tenure (in years)	11,077	15.54	8.53
Experience (in years)	11,077	21.81	7.51
Firm size (number of employees)			
≤100	408	0.037	
101-300	475	0.043	
301-1,000	1,136	0.103	
1,001-2,000	1,136	0.103	
2,001-5,000	1,420	0.128	
5,001-10,000	1,391	0.126	
10,001-30,000	2,898	0.262	
>30,000	2,213	0.200	
Hierarchical Level			
Level 1 (top management)	197	0.018	
Level 2	1,596	0.144	
Level 3	5,818	0.525	
Level 4	3,466	0.313	
Year			
2008	3,618	0.327	
2009	3,763	0.340	
2010	3,696	0.334	

Table 2: Comparisons with the Status Quo (Random Effects Linear Regressions)

	(1) only total compensation in t	(2) only total compensation in t	(3) Fixed salary/ Bonus t	(4) Fixed salary/ Bonus t	(5) Total compensation t and t-1	(6) Fixed salary/ Bonus t and t-1
Total Compensation	0.0026*** (0.0006)	0.0031*** (0.0010)			0.0026** (0.0011)	
L.Total Compensation					0.0010 (0.0012)	
Fixed Salary			0.0031** (0.0015)	0.0044* (0.0023)		0.0066* (0.0035)
L.Fixed Salary						-0.0030 (0.0034)
Bonus Payment			0.0039** (0.0016)	0.0066** (0.0032)		0.0066** (0.0032)
L.Bonus Payment						0.0007 (0.0025)
Female (dummy)	-0.0776 (0.0821)	-0.0378 (0.1274)	-0.0776 (0.0822)	-0.0310 (0.1277)	-0.0354 (0.1275)	-0.0370 (0.1274)
In Relationship (dummy)	0.1285 (0.0867)	0.3232** (0.1339)	0.1254 (0.0868)	0.3014** (0.1334)	0.3190** (0.1340)	0.3041** (0.1335)
Children in Household (1=yes)	0.0727 (0.0541)	0.0194 (0.0798)	0.0690 (0.0542)	0.0170 (0.0800)	0.0178 (0.0799)	0.0175 (0.0800)
Distance to workplace (in km)	-0.0020** (0.0010)	-0.0024* (0.0014)	-0.0020** (0.0010)	-0.0025* (0.0014)	-0.0024* (0.0014)	-0.0025* (0.0014)
Up to 100 employees	0.2085 (0.1566)	-0.2410 (0.2598)	0.2185 (0.1572)	-0.2276 (0.2604)	-0.2312 (0.2611)	-0.2196 (0.2606)
1-300 employees	0.0112 (0.1414)	-0.0001 (0.2045)	0.0158 (0.1413)	0.0390 (0.2080)	0.0059 (0.2050)	0.0439 (0.2081)
301-1,000 employees	0.1881* (0.0967)	0.1880 (0.1458)	0.1911** (0.0969)	0.1813 (0.1458)	0.1903 (0.1459)	0.1826 (0.1459)
1,001-2,000 employees	---	---	---	---	---	---
2,001-5,000 employees	0.0459 (0.0937)	0.0090 (0.1347)	0.0440 (0.0938)	-0.0045 (0.1347)	0.0070 (0.1348)	-0.0032 (0.1347)
5,001-10,000 employees	0.0425 (0.0951)	-0.0872 (0.1411)	0.0387 (0.0953)	-0.1060 (0.1416)	-0.0905 (0.1411)	-0.1040 (0.1415)
10,001-30,000 employees	0.4355*** (0.0839)	0.3362*** (0.1227)	0.4255*** (0.0846)	0.3008** (0.1240)	0.3284*** (0.1234)	0.3013** (0.1243)
At least 30,001 employees	0.4450*** (0.0872)	0.4882*** (0.1275)	0.4413*** (0.0873)	0.4478*** (0.1294)	0.4799*** (0.1278)	0.4410*** (0.1313)
Tenure (in years)	-0.0048 (0.0047)	-0.0019 (0.0073)	-0.0047 (0.0047)	-0.0021 (0.0073)	-0.0021 (0.0073)	-0.0017 (0.0073)
Experience (in years)	-0.0202*** (0.0053)	-0.0208** (0.0085)	-0.0211*** (0.0055)	-0.02321*** (0.0087)	-0.0218** (0.0086)	-0.0220** (0.0089)
Level 1 (Top Management)	0.6726*** (0.2179)	0.6003 (0.3800)	0.6357*** (0.2209)	0.4998 (0.3770)	0.5670 (0.3843)	0.4869 (0.3808)
Level 2	0.1781** (0.0736)	0.1542 (0.1074)	0.1770** (0.0745)	0.1458 (0.1080)	0.1435 (0.1083)	0.1446 (0.1081)
Level 3	---	---	---	---	---	---
Level 4	-0.2607*** (0.0511)	-0.3484*** (0.0763)	-0.2528*** (0.0515)	-0.3127*** (0.0776)	-0.3412*** (0.0766)	-0.3148*** (0.0776)
2008	0.0380 (0.0408)		0.0315 (0.0417)			
2009	0.0055 (0.0375)	0.0241 (0.0452)	0.0020 (0.0375)	0.0113 (0.0455)	0.0202 (0.0457)	0.038 (0.0472)
2010	---	---	---	---	---	---
Constant	6.7274*** (0.1391)	6.5745*** (0.2091)	6.6933*** (0.1549)	6.5052*** (0.2333)	6.5556*** (0.2094)	6.5202*** (0.2382)
Observations (persons)	11,077 (6,571)	4,766 (3,203)	11,077 (6,571)	4,766 (3,203)	4,766 (3,203)	4,766 (3,203)
R^2 (overall)	0.0283	0.0331	0.0286	0.0332	0.0329	0.0338

Figure 2: Status Quo Preferences and Loss Aversion

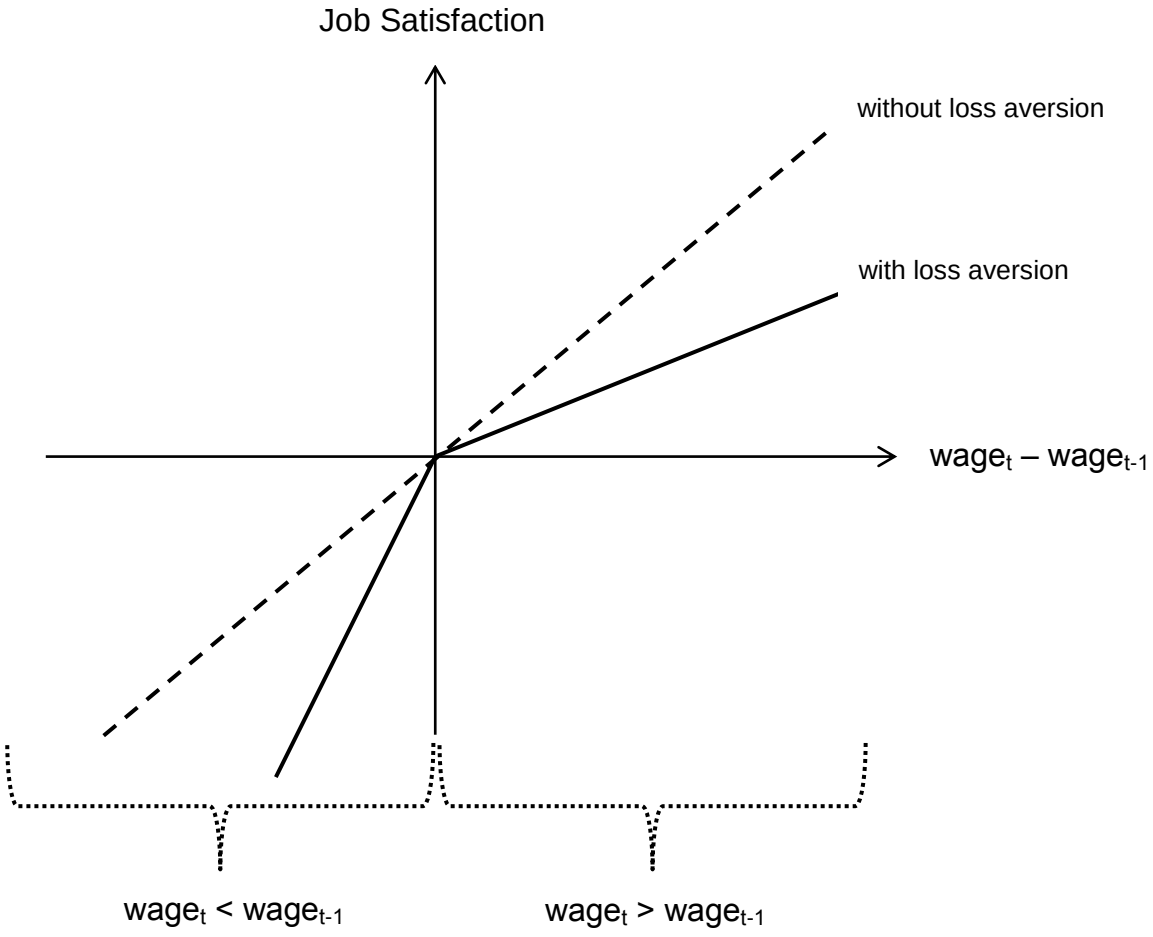

Table 3: Status Quo Preferences and Loss Aversion (Random Effects Linear Regressions)

	(1) Total compensation	(2) Fixed salary/ Bonus
Total Compensation	0.0043*** (0.0013)	
(Total Comp$_t$ – Total Comp$_{t-1}$)	-0.0027 (0.0020)	
(Total Comp – L.Total Comp)*Decrease	0.0037 (0.0033)	
Fixed Salary		0.0037 (0.0025)
(Fixed Salary – L.Fixed Salary		0.0058 (0.0040)
(Fixed Salary – L.Fixed Salary)*Decrease		-0.0154* (0.0080)
Bonus Payment		0.0075* (0.0039)
(Bonus – L.Bonus)		-0.0031 (0.0051)
(Bonus – L.Bonus)*Decrease		0.0039 (0.0070)
Female (dummy)	-0.0321 (0.1275)	-0.0313 (0.1264)
In Relationship (dummy)	0.3151** (0.1340)	0.2903** (0.1314)
Children in Household (1=yes)	0.0171 (0.0799)	0.0225 (0.0326)
Distance to workplace (in km)	-0.0024* (0.0014)	-0.0025* (0.0014)
Up to 100 employees	-0.2246 (0.2618)	-0.2178 (0.2611)
1-300 employees	0.0099 (0.2048)	0.0398 (0.2085)
301-1,000 employees	0.1903 (0.1459)	0.1901 (0.1459)
1,001-2,000 employees	---	---
2,001-5,000 employees	0.0045 (0.1348)	0.0026 (0.1343)
5,001-10,000 employees	-0.0960 (0.1413)	-0.1044 (0.1413)
10,001-30,000 employees	0.3159** (0.1239)	0.2942** (0.1240)
At least 30,001 employees	0.4708*** (0.1280)	0.4361*** (0.1310)
Tenure (in years)	-0.0024 (0.0073)	-0.0012 (0.0073)
Experience (in years)	-0.0226*** (0.0086)	-0.0226** (0.0089)
Level 1 (Top Management)	0.5432 (0.3845)	0.4654 (0.3834)
Level 2	0.1411 (0.1081)	0.1430 (0.1091)
Level 3	---	---
Level 4	-0.3320*** (0.0769)	-0.3103*** (0.0776)
2009	0.0210 (0.0457)	0.0003 (0.0472)
Constant	6.5217*** (0.2115)	6.4926*** (0.2405)
Observations (persons)	4,766 (3,203)	4,766 (3,203)
R^2 (overall)	0.0333	0.0342

Table 4: Social Comparisons (Random Effects Linear Regressions)

	(1) Market level Total Compensation	(2) Market level Fixed salary / Bonus	(3) Firm level Total Compensation	(4) Firm level Fixed salary / Bonus
Total Compensation	0.0032*** (0.0006)		0.0018 (0.0015)	
Reference Total Compensation	-0.0146*** (0.0034)		0.0012 (0.0026)	
Fixed Salary		0.0043*** (0.0015)		0.0072* (0.0041)
Reference Fixed Salary		-0.0432*** (0.0082)		-0.0060 (0.0086)
Bonus Payment		0.0044*** (0.0016)		0.0051 (0.0047)
Reference Bonus Payment		0.0074 (0.0081)		-0.0114 (0.0080)
Female (dummy)	-0.0672 (0.0820)	-0.0654 (0.0820)	0.0913 (0.1586)	0.0989 (0.1579)
In Relationship (dummy)	0.1290 (0.0867)	0.1237 (0.0867)	-0.1282 (0.1595)	-0.1559 (0.1588)
Children in Household (1=yes)	0.0921* (0.0542)	0.1139** (0.0546)	0.1357 (0.1092)	0.1356 (0.1088)
Distance to workplace (in km)	-0.0021** (0.0010)	-0.0020** (0.0010)	-0.0038 (0.0024)	-0.0037 (0.0037)
Up to 100 employees	-0.2653 (0.1916)	-0.6070*** (0.2083)		
1-300 employees	-0.2325 (0.1526)	-0.3689** (0.1550)		
301-1,000 employees	0.0752 (0.1006)	0.0453 (0.1001)		
1,001-2,000 employees	---	---		
2,001-5,000 employees	0.0894 (0.0937)	0.1379 (0.0955)		
5,001-10,000 employees	0.1923* (0.1003)	0.2409** (0.1004)		
10,001-30,000 employees	0.6921*** (0.1020)	0.8529*** (0.1099)		
At least 30,001 employees	0.7136*** (0.1053)	0.6387*** (0.1022)		
Firm dummies	No	No	Yes	Yes
Tenure (in years)	-0.0045 (0.0047)	-0.0044 (0.0047)	-0.0115 (0.0108)	-0.0128 (0.0108)
Experience (in years)	0.0084 (0.0086)	0.0372*** (0.0117)	-0.0128 (0.0122)	-0.0057 (0.0155)
Level 1 (Top management)	1.7914*** (0.3317)	2.4097*** (0.3556)	0.3297 (0.4475)	0.7182 (0.5080)
Level 2	0.6935*** (0.1428)	0.9354*** (0.1482)	0.1793 (0.2537)	0.5818* (0.3001)
Level 3	---	---	---	---
Level 4	-0.5203*** (0.0787)	-0.7328*** (0.0961)	-0.4344*** (0.1135)	-0.5277*** (0.1422)
2008	0.0557 (0.0411)	-0.0740 (0.0543)	0.0757 (0.0780)	0.1228 (0.0901)
2009	-0.0180 (0.0375)	-0.0482 (0.0390)	0.0440 (0.0702)	0.0671 (0.0707)
2010	---	---	---	---
Constant	7.5838*** (0.2384)	9.1232*** (0.4767)	7.4265*** (0.2800)	7.7205*** (0.5222)
Observations (persons)	11,077 (6,571)	11,077 (6,571)	2,939 (1,707)	2,939 (1,707)
R^2 (overall)	0.0304	0.03245	0.0582	0.0622

Table 5: Social Comparisons and Social Loss Aversion (Random Effects Linear Regressions)

	(1) Market level Total Compensation	(2) Market level Fixed salary / Bonus	(3) Firm level Total Compensation	(4) Firm level Fixed salary / Bonus
Total Compensation	-0.1063*** (0.0033)		0.0053*** (0.0021)	
(Total Comp – Total Comp^{ref})	0.0127*** (0.0034)		-0.0061* (0.0034)	
(Total Comp – Total Comp^{ref})*Below	0.0052** (0.0022)		0.0095* (0.0050)	
Fixed Salary		-0.0390*** (0.0082)		0.0020 (0.0081)
(Fixed Salary – Fixed Salary^{ref})		0.0430*** (0.0083)		0.0026 (0.0100)
(Fixed Salary – Fixed Salary^{ref})*Below		0.0006 (0.0040)		0.0052 (0.0109)
Bonus Payment		0.0137* (0.0080)		-0.0044 (0.0073)
(Bonus – Bonus^{ref})		-0.0111 (0.0082)		0.0064 (0.0099)
(Bonus – Bonus^{ref})*Below		0.0094* (0.0056)		0.0164 (0.0131)
Female (dummy)	-0.0597 (0.0821)	-0.0644 (0.0820)	0.1004 (0.1580)	0.1023 (0.1576)
In Relationship (dummy)	0.1259 (0.0867)	0.1234 (0.0866)	-0.1351 (0.1590)	-0.1534 (0.1588)
Children in Household (1=yes)	0.0877 (0.0541)	0.1127** (0.0546)	0.1343 (0.1092)	0.1355 (0.1089)
Distance to workplace (in km)	-0.0021** (0.0010)	-0.0021** (0.0010)	-0.0038 (0.0024)	-0.0037 (0.0024)
Up to 100 employees	-0.2559 (0.1917)	-0.6104*** (0.2084)		
1-300 employees	-0.2256 (0.1526)	-0.3700*** (0.1552)		
301-1,000 employees	0.0781 (0.1005)	0.0476 (0.1000)		
1,001-2,000 employees	---	---		
2,001-5,000 employees	0.0901 (0.0937)	0.1350 (0.0956)		
5,001-10,000 employees	0.1871* (0.1003)	0.2324** (0.1007)		
10,001-30,000 employees	0.6836*** (0.1020)	0.8426*** (0.1100)		
At least 30,001 employees	0.7127*** (0.1052)	0.6263*** (0.1023)		
Firm dummies	No	No	Yes	Yes
Tenure (in years)	-0.0054 (0.0047)	-0.0050 (0.0047)	-0.0125 (0.0108)	-0.0138 (0.0108)
Experience (in years)	0.0087 (0.0086)	0.0378*** (0.0117)	-0.0141 (0.0122)	-0.0054 (0.0155)
Level 1 (Top management)	1.8222*** (0.3331)	2.4577*** (0.3585)	0.0890 (0.5983)	0.5479 (0.5443)
Level 2	0.7047*** (0.1434)	0.9496*** (0.1490)	0.1367 (0.2565)	0.5882 (0.2995)
Level 3	---	---	---	---
Level 4	-0.5185*** (0.0786)	-0.7337*** (0.0962)	-0.4037*** (0.1130)	-0.5168** (0.1425)
2008	0.0582 (0.0412)	-0.0734 (0.0543)	0.0730 (0.0778)	0.1253 (0.0902)
2009	-0.0171 (0.0375)	-0.0469 (0.0390)	0.0410 (0.0702)	0.0650 (0.0708)
2010	---	---	---	---
Constant	7.5478*** (0.2375)	9.1433*** (0.4771)	7.2759*** (0.2834)	7.6584*** (0.5243)
Observations (persons)	11,077 (6,571)	11,077 (6,571)	2,939 (1,707)	2,939 (1,707)
R^2 (overall)	0.0309	0.0332	0.0601	0.0634

Appendix 1: Variable definitions and operationalizations

Job satisfaction	Overall satisfaction with the job, measured on a 11-digit scale from 0 (totally unhappy) to 10 (totally happy)
Total Compensation	Gross annual total monetary compensation in 1,000 Euro. Computed as the sum of fixed salaries, bonus payments and other income components (such as exercises stock options, inventors´ gratuities or jubilee payments)
Fixed Salaries	Gross annual fixed salaries in 1,000 Euro, guaranteed by the work contract
Bonus Payments	Gross annual bonus payments in 1,000 Euro
Reference Total Compensation (Fixed Salaries, Bonus Payments)	Average gross annual total monetary compensation (fixed salaries, bonus payments) in 1,000 Euro of a reference group. *Regarding social comparisons on the market level:* managers with the same work experience in the same firm size on the same hierarchical level in the same year. *Regarding social comparisons on the firm level:* managers with the same work experience on the same hierarchical level in the same firm in the same year
Female	Dummy for females (1=yes)
In Relationship	Dummy for being in a relationship (1=yes)
Children in household	Dummy for minor child(ren) in household
Distance to workplace	One-way distance to the workplace in kilometers
Tenure	Tenure with the firm in years
Experience	Work experience, measured by the years since graduation
Firm size	Dummies for the size of the actual firm in which the manager is occupied. As a proxy, the number of employees of the firm is used. There are eight different categories: (1) Up to 100 employees, (2) 101-300 employees, (3) 301-1,000 employees, (4) 1,001-2,000 employees, (5) 2,001-5,000 employees, (6) 5,001-10,000 employees, (7) 10,001-30,000 employee and (8) at least 30,001 employees
Hierarchical Level	Dummies for the hierarchical level on which the managers works. Within the questionnaire, respondents are asked to allocate them to one of four management levels, whereas level 1 represents the top-management level
Year	Dummies for the observation year