



IAAEU

Institut für Arbeitsrecht
und Arbeitsbeziehungen
in der Europäischen Union

IAAEU Discussion Paper Series in Economics
No. 06/2024



**Bonuses, Profit-sharing and Job
Satisfaction: the More, the Better?**

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February 2024

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February 01, 2024

Abstract

Managers frequently offer unconditional bonuses and profit-sharing payments to their employees. The isolated effects of the former payment type on job satisfaction, in particular, have received little empirical attention. This study uses German panel data and shows that, even when total income is held constant, workers report significantly higher levels of job satisfaction when wages contain such bonuses, mostly regardless of their relative size. Conversely, profit-sharing payments show a positive association only if they are sufficiently large. However, when endogeneity issues are taken into account, the latter correlation becomes weaker or vanishes. The findings have significant implications for managers when designing salary packages since they imply that monetary gifts in the form of unconditional bonus payments can be a beneficial alternative to incentives in enhancing employee's job satisfaction.

Keywords: bonuses, profit-sharing, gift-exchange, incentives, job satisfaction

JEL Codes: J33, M52, M54, I31

*I thank Laszlo Goerke, Anthony Lepinteur, Jan Sauermann and members of the IAAEU staff for valuable comments and suggestions. Furthermore, this paper has benefited from valuable feedback received by participants of the 2022 virtual Workshop on Labour Economics (WLE) at the IAAEU in Trier, the 2022 Labour Economics Meeting at UCLM in Albacete, the 2022 UECE Conference on Economic and Financial Adjustments in Lisbon, the 2023 Workshop on Performance Pay at the IAAEU in Trier and the 2023 COPE in Amsterdam.

1 Introduction

The importance of job satisfaction as a proxy for workers' well-being and the consequences on labor market outcomes are widely discussed in the fields of economics and psychology. Studies find that job satisfaction helps predict the intention and probability of future job quits (Scott and Taylor, 1985; Firth et al., 2004). In a similar vein, it is relevant in workers' retirement decisions, as lower levels of job satisfaction are associated with earlier retirement (Clark et al., 2015). Increasing job satisfaction may even work as a substitute to circumvent widely debated regulatory approaches, including prolonging the retirement age (Kautonen et al., 2012). Finally, higher job satisfaction is associated with higher individual productivity levels (Bhatti and Qureshi, 2007; Halkos and Bousinakis, 2010; Oswald et al., 2015).

One important factor influencing workers' satisfaction is the wage package. Employers in Germany often provide bonus payments, such as Christmas or vacation bonuses, that are mostly unrelated to a specific performance target.¹ However, the relevance of bonus and profit-sharing payments is not limited to the German context: According to a recent report (Paylab, 2017) on 12 European countries, between 4% and 44% of employees receive a Christmas bonus, with the size ranging from 21% to 91% when compared to the average base salary in the country. The proportion of employees receiving an end-of-year bonus (such as profit-sharing) is typically smaller (10%-27%), but the payment is more generous (47%-114% of base salary). For employers, the employee's preferences and response in terms of job satisfaction can be an important consideration to make when shaping the wage package.

This study aims to look beyond a sole income effect (due to a change in bonus or profit-sharing payments) and disentangle a worker's preferences about wage components, namely base wages, bonuses and profit-sharing payments.

Besides higher income levels, variable payments can affect a worker's job satisfaction in multiple ways. Given the characteristics of bonuses, which are frequently given unconditionally, potentially as a surprise, and with little control from the employee, Gift-exchange theory (Akerlof, 1982) suggests that such payments can be perceived as a form of trust and appreciation from the employer, which in turn can affect morale and motivation, resulting in a positive relationship with job satisfaction. Profit-Sharing payments, conversely, are only given with expectations about the companies' performance, and the gift-exchange mechanism may not apply here. Still, agency theory predicts a positive relationship between

¹According to the data used in this study, 45 percent of employees received an additional Christmas or vacation bonus in 2019. Furthermore, companies in Germany are increasingly making use of payments tied to the company's success, such as profit-sharing payments. In the last four decades, the percentage of individuals working for companies that share profits with their employees increased from approximately 4% in 1984 to 15% in 2019.

profit-sharing and job satisfaction. Linking compensation to production outcomes that at least partially correlate with the agent's performance will help the agent and the principal's interests match up (Kunz and Pfaff, 2002). Apart from the positive effects, there are various mechanisms under which profit-sharing and bonus payments yield lower levels of job satisfaction: First, group rewards may enhance the possibility of free-riding, leading to increased co-worker peer pressure and monitoring, which can decrease workers' utility (Bryson et al., 2016). Second, insufficient transparency or communication of the performance target or the bonus calculation can lead to dissatisfied employees (Lawler III, 1992; Long, 2000). Third, a higher fraction of variable pay can be associated with higher earnings risk, yielding lower levels of job satisfaction, especially for risk-averse employees (Cadsby et al., 2007; Grund and Sliwka, 2010). Furthermore, job satisfaction may suffer if the payment is compared to a peer group of employees and perceived as unfair. Overall, the variety of channels and mechanism implies that the association of bonuses and profit-sharing payments with job satisfaction is an empirical issue.

This study extends two main strands of empirical literature. The first strand covers research on consequences of monetary gift exchange (Kube et al., 2012; Currie et al., 2013; Neckermann and Yang, 2017; Englmaier and Leider, 2020). In this study I use information about individual bonus payments to study the consequences of monetary gifts on job satisfaction. The second strand includes employees response to group-based performance pay (e.g. Heywood and Wei, 2006; Green and Heywood, 2008; Artz, 2010; Pouliakas, 2010; Bryson et al., 2016) analyzed via the prevalence of profit-sharing payments. Additionally, within those strands I extend findings on the importance of (relative) payment size (Gneezy and Rustichini, 2000; Freeman et al., 2010; Pouliakas, 2010; Bryson et al., 2016; Chen, 2018; Gilchrist et al., 2016; Isselhard et al., 2022). The notion here is that contrary to agency theory predictions, small payments can have no, or even negative effects.

The aforementioned literature strands include payment types that differ by nature. In this study I make three significant contributions with the overall aim of isolating and comparing the effectiveness of both monetary gifts and incentives utilizing data provided by the German Socio-Economic Panel covering the years from 1985-2020. First, I show that both payment types are positively correlated with job satisfaction, even when total income is held constant. However, this hides an important heterogeneity: Employees with (relatively) small profit sharing payments display no positive relationship, while bonus payments positively affect workers job satisfaction irrespective of the payment size. This strengthens previous findings on job satisfaction (e.g. Pouliakas, 2010; Bryson et al., 2016) that incentives should be large enough to have a positive effect, while also demonstrating that small monetary gifts (bonuses)

can be a valid alternative to performance-oriented group-based incentives (profit-sharing) in increasing employee job satisfaction.

Second, this study sheds light not only on differences in perception of bonuses versus profit-sharing payments but also on differences in the underlying mechanisms that moderate the relationship. The findings reveal that bonuses work better for workers who report higher levels of (positive) reciprocity, which suggests that such payments may capture the character of a monetary gift. Additionally, enhancing job satisfaction with bonus payments only works in the private sector and works better in smaller companies, where the distance between employer and employee is smaller and labor market institutions play a smaller role. Furthermore, the findings reveal stronger correlations for workers that are with the firm for a longer period of time and benefit from special tenure-related bonus payments. Profit-sharing payment effectiveness shows fewer variations overall and is mostly driven by workers in smaller companies, possibly due to a bigger individual contribution to the companies profit target.

Last, this study employs a number of estimation strategies including individual fixed effects, worker-in-firm fixed effects and instrumental variables to address endogeneity issues. Irrespective of the estimation strategy, the main results on the relationship between bonus payments and job satisfaction hold. Conversely, even larger profit-sharing payments show smaller correlations when adding further control variables related to other compensation components and the firms economic situation and the main results vanish even for payments when instrumenting the prevalence of larger payments. The different results underlie the importance of distinguishing between payment types even more, which is challenging in a number of survey data-sets.² However, even if the data structure allows to look at the isolated effects of profit-sharing payments, it appears that they likely capture other (unobserved) characteristics in research designs that rely on individual level survey data.

The remainder of the study continues as follows: Section 2 sets the stage by discussing the literature on performance pay, gift exchange and job satisfaction. The data used is presented in Section 3. The empirical strategy is shown in Section 4. Section 5 presents the results and Section 6 concludes.

2 Literature Review

The topic of bonuses, profit-sharing payments and job satisfaction fits within two key strands of literature: monetary gift exchange and performance pay. The former strand, mostly comprises the effects of unconditional bonus payments on productivity and effort, while job satisfaction receives little at-

²For instance, in the British Household Panel Survey, unconditional bonuses and revenue sharing payments are treated as one type of payment due to questionnaire design.

tention. On the other hand, studies on performance-related pay provide evidence on the relationship between profit-sharing payments and job satisfaction. However, due to data issues, especially unconditional bonuses and group-based performance pay are often aggregated to one measure, which yields little implications about the practical effectiveness of each type of payment.

Monetary Gift Exchange Gift-exchange theory is based on Akerlof (1982) and implies that increasing an employee's wage, for instance through an unconditional bonus payment, above the market-clearing level may result in reciprocal behavior, i.e. excess effort.

While there is little direct empirical evidence on the relationship between monetary gifts and job satisfaction, the effects on effort, productivity and performance have been extensively studied. As studies suggest that higher job satisfaction is associated with higher levels of such outcomes (Bhatti and Qureshi, 2007; Halkos and Bousinakis, 2010; Oswald et al., 2015), the empirical findings are worth mentioning. A large strand of literature finds positive effects in terms of effort in line with Akerlof's original hypothesis (Fehr and Gächter, 2000; Charness, 2004; Bellemare and Shearer, 2009; Kube et al., 2012; Currie et al., 2013). However, several recent studies also fail to identify a positive effect of monetary gifts (Neckermann and Yang, 2017; Englmaier and Leider, 2020; Bogliacino et al., 2021).

In studies that explicitly study unconditional bonus payments, the results are also mixed. Bellemare and Shearer (2009) conducted a field experiment in which workers were given a surprise bonus on top of their regular piece rate, resulting in higher productivity rates. In contrast, a recent study of Bogliacino et al. (2021) finds reductions in productivity in response to bonus payments as workers may interpret the monetary bonus as a sign that the manager is pleased with their work and is unlikely to punish or even fire them, leading them to believe that they have the right to reduce their effort. These results, however, may not imply lower job satisfaction levels.³ Gilchrist et al. (2016) discover that simply increasing base wages does not lead to higher effort levels. However, if an unconditional bonus is paid, employees display productivity increases. In other words, employees are more likely to reciprocate when the gift is more visible. In line with that, firm-level evidence by Isselhard et al. (2022) shows that an unconditional monetary gift is effective depending on its relative size (compared to base wages). The authors find that employees with a relatively high wage react stronger to performance pay, while those with a lower wage enhance performance for monetary gifts. They claim that employees react stronger if the bonus makes up for a larger portion of the wage and workers react in a more reciprocal way. Apart from effort, Choi

³Indeed, De Ree et al. (2018) find that unconditionally doubling teachers' base salary did lead to higher satisfaction but not effort.

(2014) finds that a signing bonus has a positive impact on employees' trust in the employer. This finding may also result in higher levels of job satisfaction in response to monetary gifts.

Performance-related Pay and Job Satisfaction A large body of literature studies the relationship between performance pay and job satisfaction. The focus here primarily lies in the effect of individual performance pay schemes. While the latter is associated with the alignment of employee and employer interests, improved productivity (see Lazear, 2000), and a positive income effect, a large number of studies show that individual performance pay may also cause workers' utility to decrease as the prevalence of such pay schemes (especially in the form of piece rates) is associated with higher levels of stress (Cadsby et al., 2016; Allan et al., 2021; Baktash et al., 2022b), more workplace injuries (Artz and Heywood, 2015), lower physical and mental health (Bender and Theodossiou, 2014; Dahl and Pierce, 2020) and increased alcohol consumption (Baktash et al., 2022a). However, these detrimental effects seem not enough to cancel out positive productivity and motivational aspects as the empirical literature usually displays an overall positive effect on job satisfaction (e.g. Heywood and Wei, 2006; Green and Heywood, 2008).

Group rewards such as profit-sharing may be an option to avoid the negative channels associated with individual performance pay by putting less pressure on the individual and incentivizing the group as a whole. Previous studies mainly analyzed the relationship between the incidence of profit-sharing payments and job satisfaction, with positive findings (e.g. Heywood and Wei, 2006; Green and Heywood, 2008; Artz, 2010). Furthermore, the success of profit-sharing plans is found to differ across groups. Heywood and Wei (2006) show that profit-sharing schemes are associated with higher levels of job satisfaction, while women, in particular, seem to get no additional satisfaction from these payments. Artz (2008) finds no significant effect of profit-sharing on overall job satisfaction in medium and large firms. On the other hand, he claims that group-based rewards work better in small companies where the distance to the employer is shorter.

In addition to individual characteristics, the success of profit-sharing payments is claimed to depend on payment size. Only a handful of studies analyzed the role of profit-sharing size in terms of well-being. Three studies are similar to mine: First, Pouliakas (2010) uses British household survey data and goes beyond the mere incidence of bonuses and group payments. The author discovers that the proportion of workers' salaries tied to bonuses and group rewards is important in explaining job satisfaction. The study concludes that these payments are only significant in determining job satisfaction if sufficiently large. Second, Bryson et al. (2016) highlight the effects of share capitalism (and its size) on

workers' well-being using British household and European Working Condition data. The authors discover that various group-performance schemes are associated with higher levels of job satisfaction and help mitigate the impact of poor working conditions. Additionally, small bonus/profit-sharing payments do not significantly affect job satisfaction. In line with this, recent US survey evidence (Chen, 2018) using General Society data demonstrates that individual and group-performance pay increases job satisfaction only if the payment is sufficiently large. However, because of the questionnaire design, neither of the three aforementioned studies can distinguish the effect of profit-sharing size from the size of other types of payments.⁴

With this study, I contribute to both of the mentioned strands of literature. Most research on monetary gift exchange focuses on productivity or effort outcomes. Worker well-being can constitute a channel for influencing such outcomes that is worth exploring. I demonstrate that monetary gifts in the form of unconditional bonus payments do affect worker job satisfaction, even if the gift is small in value, which is in contrast to the findings of Isselhard et al. (2022). In the second strand, which focuses on performance-based pay, the data mostly prevents to isolate the effects of (relative) profit-sharing and bonus size on worker job satisfaction. This study builds a measure of both using detailed individual-level information from such payments over a long period of time.

3 Data

This study uses 36 waves of the German Socio-Economic Panel (GSOEP, version 37) between 1985-2020.⁵ The GSOEP is an annual representative household panel study of the German population that, in recent waves, included approximately 30,000 individuals and 14,000 households (Goebel et al., 2019).

Dependent Variable Employees were asked about their current job satisfaction on a scale of 0 to 10 in all survey years ("How satisfied are you today with the following areas of your life?: Work"). 0 represents the lowest level of job satisfaction and 10 the highest level of job satisfaction. The ordinal scaled job satisfaction variable will be treated as continuous throughout the study.

Independent Variables The GSOEP includes detailed information on employee bonuses and profit-sharing payments. Importantly, the data allows to distinguish between bonuses that are likely *performance-*

⁴For instance, Bryson et al. (2016) look at the size of bonuses and profit-sharing payments as one component and Chen (2018) include an aggregate measure of individual performance pay and profit-sharing payments. Notably, the latter may be more influenced by the aforementioned health channels.

⁵GSOEP provides data from 1984. However, questions regarding profit-sharing were not asked in that year.

unrelated, such as Christmas bonus, 13th salary, 14th salary, vacation bonus or other bonus payments and profit-sharing as a measure of *group performance pay*.⁶ The data provided allows inferring not only about the prevalence of these payments but also about their size. In addition to such payments, the data includes monthly gross earnings (bonuses excluded) for all relevant survey years.⁷ To obtain a relative measure of bonus and profit-sharing payments, I construct the following two main independent variables bonus intensity (BI) and profit-sharing intensity (PSI):

$$BI_{i,t} = \begin{cases} 0, & \text{if } B_{i,t} = 0 \\ \frac{B_{i,t}}{E_{i,t}}, & \text{if } B_{i,t} > 0 \end{cases} \quad (1)$$

$$PSI_{i,t} = \begin{cases} 0, & \text{if } PS_{i,t} = 0 \\ \frac{PS_{i,t}}{E_{i,t}}, & \text{if } PS_{i,t} > 0 \end{cases} \quad (2)$$

With $B_{i,t}$ ($PS_{i,t}$) indicating the total bonus (profit-sharing) amount paid in the previous calendar year and $E_{i,t}$ reported gross earnings in the last month (bonus and profit-sharing payments are excluded). Consequently, an intensity of 1 means that the sum of bonuses (profit-sharing payments) equals one monthly gross salary. This measure is also referred to as the 'bonus-to-base ratio' and gives important implications about the relative size of the bonus/profit-sharing payment. Similar to Pouliakas (2010), I employ a continuous and categorical measure of BI/PSI (see section 5.3). The latter makes clear whether potential consequences on job satisfaction differ along the distribution. Therefore for both BI and PSI, I estimate the 0th, 25th and 75th quantile of the conditional bonus/profit-sharing distribution as cut-off points to categorize intensities into four groups. The respective intervals denote at (0;0.4), [0.4;1.1) and ≥ 1.1 for BI, and (0;0.2), [0.2;1.0) and ≥ 1.0 for PSI.⁸ Receiving zero payments will function as the baseline category in the upcoming estimates.

The components of the independent variable differ in the time dimension, which is one restriction on the data. Bonus/profit-sharing payments are reported for the previous calendar year, whereas gross earnings are reported for the previous month. Individuals who have recently changed jobs would report

⁶The exact survey question states: "Did you receive any of the following bonuses or extra pay from your employer last year? If yes, please state the gross amount." Possible answers include Christmas bonus, 13th salary, 14th salary, vacation bonus, other bonus or profit-sharing payments. The information is available from 1985-2020.

⁷The exact survey question is: "What did you earn from your work last month? Please state both: gross income, which means income before the deduction of taxes and social security, and net income, which means income after the deduction of taxes, social security, and unemployment and health insurance. If you received extra income, such as vacation pay or back pay, please do not include this. Please do include overtime pay"

⁸Note that Pouliakas (2010) uses a more detailed level of categories. However, as the findings do not change qualitatively and for simplicity reasons, the 5th, 50th and 95th percentiles are not displayed but can be received from the author upon request.

variable payments from their previous employer and gross earnings from their new employer. As a result, estimates for intensity variables may be imprecise. The issue will be addressed in section 5.3, where I use a measure of workers' gross earnings that aligns with the time dimension of the bonus/profit-sharing components. Further sensitivity checks w.r.t. the definition of the independent variables will be also applied in that section.

Control Variables Employees' BI/PSI is likely to be related to socioeconomic characteristics, which may also correlate with job satisfaction. Therefore, I include a large set of control variables such as gender, number of children, marital status, age, and individual years of education. Furthermore, BI and PSI differ across firms, occupations, and industries. GSOEP provides data on a detailed level of occupation according to the International Standard Classification of Occupations (ISCO-88).⁹ For the main specification, I use 1-digit ISCO-88 codes. In addition to the occupational level, I include ten broad (1-digit) industry dummies that could be related to both job satisfaction and BI/PSI. A set of job-related control variables is also included. For example, I consider contractual hours and overtime, which should be positively correlated with incentive pay (profit-sharing), but negatively correlated with job satisfaction. Critically, the logarithm of total earnings (defined as the sum of yearly gross earnings and yearly bonus/profit-sharing payments) is included to estimate effects that go beyond a mere increase in income.¹⁰

Estimation Sample The sample is restricted to the working age population between 15 and 65 years and excludes self-employed, marginally employed, workers in vocational training and those who report no earnings in the previous month. After omitting missing values, total variable pay (sum profit-sharing payments and bonuses) is top-coded at the 99th percentile to account for outliers and ensure that my results are not driven by high-ranked individuals who report extraordinary payments.¹¹ With those adjustments, the final estimation sample contains 234,230 observations and 42,275 individuals.

⁹Note that for the years 2018 and 2019, ISCO-08 classifications were transformed into ISCO-88 classifications based on Ganzeboom and Treiman (2019).

¹⁰Further control variables are: age squared, part-time dummy, public sector dummy, company size dummies, tenure, tenure squared, residence state dummies.

¹¹Indeed, those excluded in my data are, to a large extent, corporate managers and highly skilled financial professionals. The full sample estimates without top-coding will also be discussed in section 5.3.

4 Estimation Strategy

The empirical strategy is defined in this section. The main strategy includes OLS specifications with individual fixed effects, which is defined in section 4.1. Furthermore, in section 4.2, the instruments that will be used as extra robustness tests are described.

4.1 Ordinary Least Squares Specifications

As a starting point, I estimate the association between bonus/profit-sharing payments and job satisfaction using the following equation,

$$JS_{i,t} = \alpha_1 + \alpha_2 PSI_{i,t} + \alpha_3 BI_{i,t} + \alpha_4 X'_{i,t} + \alpha_5 \lambda_i + \alpha_6 \lambda_t + \varepsilon_{i,t} \quad (3)$$

where $JS_{i,t}$ indicates employees' job satisfaction from 0-10, $PSI_{i,t}$ and $BI_{i,t}$ indicate both the continuous and categorical profit-sharing and bonus intensity as defined in the previous section. Consequently, α_2 and α_3 are the coefficients of interest. Furthermore, I put the importance of bonuses and profit-sharing payments in perspective to the findings of the literature by using a binary dummy, indicating the incidence of the respective payment (see section 5.2).

To address potential omitted variable bias, a set of control variables is included (see section 3). The entire set of control variables is referred to as $X'_{i,t}$ and shall be used throughout the remainder of the study. If not stated otherwise, standard errors are clustered on the individual level.

To make use of the panel structure of the data, I include year fixed effects (FE) (λ_t) and individual FE (λ_i). The latter is standard procedure in variable pay and well-being literature (e.g. Heywood and Wei, 2006; Green and Heywood, 2008; Pouliakas, 2010) and addresses the issue that individual time-invariant factors cannot be observed and give rise to omitted variable bias. Individual fixed effect estimations require within-person variation over time. Therefore, I calculate how often individuals change their bonus/profit-sharing status. Of the 42,275 respondents, 10,271 make the YES/NO switch and 11,180 individuals did the reverse. For profit-sharing, I find 5,714 individuals make the YES/NO and 6,369 the NO/YES switch, respectively. Overall, it appears that within-person variation is sufficient to use the panel structure of the data.¹²

To demonstrate how the effect varies between groups, I interact the intensity variables with various individual and job-related characteristics to the aforementioned specifications in section 5.4.¹³

¹²Especially since the continuous intensity measures should provide even more within-person variation than the dummies.

¹³Those factors include individual risk preferences, reciprocity, gender, public sector information, company size and tenure.

In section 6.2, I make further use of the data's panel structure and instead of worker-fixed-effects, I include worker-in-firm FE.¹⁴ Additionally, in this section, I include a control for recent job changes and several other time-variant firm characteristics that are unavailable in the full sample and may correlate with both intensity measures and workers' job satisfaction.

4.2 Two-Stage Least Squares Specifications

Bonus and profit-sharing payments are not assigned randomly. Even though the proposed estimation strategies account for time-invariant individual and individual-in-firm characteristics, other unobserved factors that change over time and on an individual level may influence both intensities and job satisfaction. Furthermore, reverse causality may play a role: For example, if the profit-sharing payment is tied to a performance measure and happier workers are more committed to achieving those targets, then a higher job satisfaction would cause higher PSI.¹⁵

To tackle those issues, I follow an instrumental variable approach based on aggregation (see, Fisman and Svensson, 2007; Cornelissen et al., 2011; Baktash et al., 2022b). Namely, I assume that an individual is more likely to receive a bonus or profit-sharing payment if a peer group of comparable workers receives such a payment. A peer group is defined on the industry-year level based on the 2-digit NACE classification. The instrument is then defined as the average incidence of bonus/profit-sharing payments within that nace-year cell. In the sample, this yields 2124 cell means for the instruments. The person affected by the instrument is excluded from the calculation. With that, I estimate the following two-stage model:

$$JS_{i,t} = \alpha_1 + \alpha_2 P\hat{S}_{i,t} + \alpha_3 \hat{B}_{i,t} + \alpha_4 X'_{i,t} + \alpha_5 \lambda_i + \alpha_6 \lambda_t + \varepsilon_{i,t} \quad (4)$$

$$\hat{B}_{i,t} = \delta_1 + \delta_2 z_{1,i,t} + \delta_3 z_{2,i,t} + \delta_4 X'_{i,t} + \delta_5 \lambda_i + \delta_6 \lambda_t + \varepsilon_{i,t} \quad (5)$$

$$P\hat{S}_{i,t} = \beta_1 + \beta_2 z_{1,i,t} + \beta_3 z_{2,i,t} + \beta_4 X'_{i,t} + \beta_5 \lambda_i + \beta_6 \lambda_t + \varepsilon_{i,t} \quad (6)$$

with (5) and (6) defining the first and (4) the second stage of the two-stage model. $z_{1,i,t}$ constitutes the industry-year specific bonus density and β_2 is the coefficient of interest in equation (5). Critically, the exclusion restriction requires that the bonus density ($z_{1,i,t}$) has no direct impact on job satisfaction

¹⁴The procedure will be further elaborated in section 6.2.

¹⁵For evidence of the relationship between well-being and productivity see, e.g., Bhatti and Qureshi (2007); Halkos and Bousinakis (2010); Oswald et al. (2015).

and only influences it indirectly through the individual bonus incidence ($\hat{B}_{i,t}$). More formally speaking, $z_{1,i,t}$ should not affect $P\hat{S}_{i,t}$ in equation (6) and should have no direct effect on $JS_{i,t}$. Additionally, conditional on covariates, $P\hat{S}_{i,t}$ and $\hat{B}_{i,t}$ should be uncorrelated with the error term $\varepsilon_{i,t}$ in (4). The same line of argument can be applied to the second instrument ($z_{2,i,t}$). Importantly, with $X'_{i,t}$, I control for the broad industry classification used in previous specifications and cluster standard errors at the nace-year level to ensure the influence of the exogenous variable does not simply capture industry differences. To account for time-invariant factors that may correlate with the aggregate instruments, I again employ individual FE. Also, in section 6.1, the definition of ($z_{2,i,t}$) will be adjusted based on the main FE findings. Last, I perform several sensitivity checks, namely ensuring valid cell means, using alternative instrument specifications and including worker-in-firm FE to provide some credibility for the main findings. However, despite the sensitivity checks, a valid exclusion restriction can only be argued and not formally tested. The IV estimators should thus be viewed primarily as an additional attempt to account for endogeneity in the baseline estimates rather than as average treatment effects.

5 Main Results

The main empirical findings are presented in this section. Section 5.1 provides an overview of BI/PSI distributional characteristics and observable differences. The findings for the incidence of bonus/profit-sharing payments are shown in section 5.2. Finally, section 5.3 emphasizes the significance of payment size, while section 5.4 discusses whether those results differ across groups.

5.1 Descriptive Evidence

Figure 1: (Conditional) BI and PSI Distribution

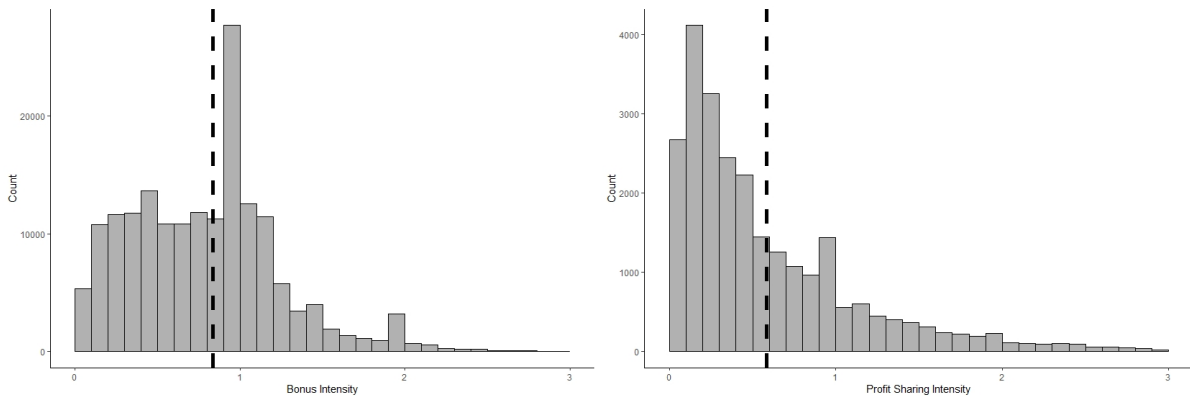


Figure notes: The figures present the distribution of bonus and profit-sharing intensities conditional on receiving the respective payment. The dashed line indicates the median of the distribution. The sample covers the years between 1985 and 2020.

Figure 1 displays the distribution of the main independent variables BI and PSI, conditional on receiving the respective payment.¹⁶ For BI, one can observe that payments between 0.90 and 1 (bonus equals one monthly gross salary) are the most common category. Profit-Sharing payments typically take a smaller fraction of the wage package. Critically, in the upcoming section, I look at the differences of these payments along the distribution. If the findings of Pouliakas (2010) and Chen (2018) hold and small payments are irrelevant, this would affect a significant fraction of profit-sharing recipients in the sample.

Table 1: Summary Statistics

Panel A: BI	BI = 0		BI ∈ (0, 0.44]		BI ∈ [0.44, 1.04)		BI ≥ 1.04	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
job satisfaction	6.88	2.10	6.99	2.06	7.09	1.96	7.19	1.90
gross earnings (base salary)	2346.96	1627.20	2335.06	1176.52	2701.12	1195.74	2865.40	1204.37
female	0.46	0.50	0.45	0.50	0.43	0.49	0.41	0.49
age	41.34	11.34	40.50	11.59	42.59	10.85	42.41	10.64
years of education	12.50	2.73	12.00	2.53	12.12	2.52	12.07	2.44
public sector	0.19	0.39	0.27	0.44	0.33	0.47	0.36	0.48
contractual working hours	35.18	8.99	36.59	7.26	36.05	6.85	36.05	6.56
overtime	2.28	3.67	2.26	3.58	2.19	3.39	2.11	3.33
tenure	8.01	9.48	9.56	9.88	12.87	10.20	13.96	9.87
Christmas bonus	0.00	0.00	0.73	0.44	0.60	0.49	0.41	0.49
13 th salary	0.00	0.00	0.09	0.28	0.38	0.48	0.67	0.47
14 th salary	0.00	0.00	0.00	0.02	0.00	0.06	0.09	0.29
vacation bonus	0.00	0.00	0.48	0.50	0.64	0.48	0.89	0.31
other bonus	0.00	0.00	0.03	0.18	0.02	0.14	0.04	0.21
N	66,170		42,132		83,913		42,015	

Panel B: PSI	PSI = 0		PSI ∈ (0, 0.19]		PSI ∈ [0.19, 0.88)		PSI ≥ 0.88	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
job satisfaction	7.04	2.02	6.98	1.94	7.10	1.82	7.21	1.76
gross earnings (base salary)	2478.80	1222.94	3100.45	1672.95	3370.14	1580.06	4372.19	1854.03
female	0.45	0.50	0.36	0.48	0.37	0.48	0.28	0.45
age	41.86	11.17	41.11	10.59	42.16	10.27	43.51	9.67
years of education	12.09	2.54	12.56	2.44	12.79	2.63	13.79	2.79
public sector	0.31	0.46	0.21	0.41	0.13	0.34	0.05	0.22
contractual working hours	35.79	7.63	37.04	5.46	36.72	5.70	38.00	4.65
overtime	2.11	3.42	2.60	3.57	2.73	3.59	4.01	4.38
tenure	11.22	10.17	12.09	10.04	13.12	10.26	13.28	10.29
N	209,244		6,252		12,448		6,246	

Table notes: The table displays the weighted means for various intensity categories. Panel A includes sample means conditional on bonus intensity, while Panel B includes sample means conditional on profit-sharing intensity. As explained in section 4.1, intensity measures are defined in relation to the sample distribution. To save space, statistics for the entire sample are suppressed but can be obtained from the author upon request.

Table 1 provides descriptive statistics for the conditional BI (PSI) distribution. Panel A displays the BI results, while Panel B displays the PSI results. At first glance, the higher the BI, the higher the reported levels of job satisfaction appear to be. The same cannot be observed for profit-sharing intensities, which show a decrease in job satisfaction for small payments (compared to no payments). Looking at the control variables, an increase in BI is associated with a higher likelihood of working

¹⁶Note that for visibility reasons, the graph is limited to observations of PSI and BI below 3, as those payments above the threshold only affect a handful of observations.

in the public sector. Moreover, employees are typically longer employed within the firm, potentially indicating the prevalence of tenure-related bonus payments. Christmas and vacation bonuses, as well as 13th salaries, are the most common types of bonus payments. The results for PSI (Panel B) show that those with higher (relative) payments also have a higher base salary¹⁷, are less likely to work in the public sector, are more educated, stay with the company for a more extended period of time, and work longer hours. The overall note here is that the data exhibits various sorting characteristics depending on the nature of the payment. Hence, controlling for such factors is crucial in the upcoming estimates.

5.2 The Prevalence of Variable Pay

In this section, I shed light on the correlation of the incidence of bonus/profit-sharing payments and job satisfaction. Table 2 presents the main estimates.¹⁸ Column 1 displays the correlation when only including year FE. In column 2, I add the set of control variables; column 3 includes the total income, and column 4 the individual FE.

The results for both bonuses and profit-sharing show that ignoring socioeconomic and job characteristics leads to upwardly biased estimates. Significantly, in column (3), the coefficients are further reduced as I account for the fact that people who work in jobs with bonuses or profit-sharing typically have a higher (total) income. Still, even after accounting for higher wages, the coefficients remain positive, indicating that bonus/profit-sharing payments are associated with higher levels of job satisfaction and employees not exclusively value the monetary value of the payment.

Additionally, including individual FE (column 4) decreases the relevance of bonus and profit-sharing payments, implying sorting effects into bonus/profit-sharing pay schemes. Workers with specific (time-invariant unobserved) characteristics that are positively related to job satisfaction appear to prefer positions with a higher likelihood of receiving a bonus or profit-sharing payment. In the final specification, receiving a bonus (profit-sharing payment) increases job satisfaction by 0.041 (0.020) SD, which amounts to approximately 80 % (40 %) of the effect of working in the public sector (+0.052) and is economically meaningful. The positive sign for both components is in line with previous research on bonus and profit-sharing payments and job satisfaction (see Heywood and Wei, 2006; Pouliakas and Theodossiou, 2009), even if the payments are looked at separately. Furthermore, the distinction between profit-sharing and bonus payments shows that bonus payments result in a greater increase in job satisfaction than profit-sharing payments.¹⁹

¹⁷The same applies for BI, however, differences are way smaller.

¹⁸The full output can be found in Table A2.

¹⁹Indeed, the linear hypothesis test shows that the coefficients are statistically different from each other (p-value = 0.04).

Table 2: Bonus/Profit-sharing Incidence and Job Satisfaction

	(1)	(2)	(3)	(4)
Bonus (0/1)	0.085*** (0.007)	0.110*** (0.008)	0.070*** (0.008)	0.041*** (0.007)
PS (0/1)	0.045*** (0.010)	0.070*** (0.010)	0.028*** (0.010)	0.020** (0.008)
log(total income)			0.235*** (0.011)	0.248*** (0.013)
Year	X	X	X	X
$X'_{i,t}$		X	X	X
Ind. FE				X
Num.Obs.	234230	234230	234230	234230
R2 Adj.	0.006	0.023	0.028	0.398
R2 Within				0.031

Table notes: The table shows the relationship between the incidence of bonuses (profit-sharing) and job satisfaction in Germany. The sample covers the years between 1985-2020. Additional control variables included are logged total (monthly) income, gender, children, marital status, age, age squared, years of education, average weekly working hours, a dummy for part-time employment, a public sector dummy, company size dummies, tenure, tenure squared, and a set of dummies for industry (10 categories), ISCO-88 1-digit codes (9 categories), residence state and year. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Other control variables (see full output Appendix A2) also confirm the results of previous studies: For instance, individuals with children and workers in the public sector are more satisfied with their jobs on average. Moreover, job satisfaction decreases with the level of education and age (see Bender et al., 2005; Green and Heywood, 2008).

5.3 Incentive Intensity and Job Satisfaction

This section will shed light on the role of payment size. I estimate equation (4.2) using the continuous (Models 1 and 2) and categorical (Models 3 and 4) definitions of BI and PSI. The results are displayed in Table 3.

The regression results show interesting findings on the relationship between BI/PSI and job satisfaction. In the FE models, an BI (PSI) increase by one standard deviation is associated with an increase in job satisfaction of 0.015 SD (0.007 SD). Increasing BI (PSI) by one SD (that is, 0.54 for BI and 0.29 for PSI) has the same effect as 25% (10%) of the effect of working in the public sector, which is economically significant, especially given that income is held constant. Again, bonuses correlate stronger with job satisfaction than profit-sharing payments.²⁰ To put the magnitude into perspective, consider the average sample worker, who earns €2,420 per month before taxes. Assuming no discounting and without considering month-to-month inflation, the aforementioned increase in job satisfaction is obtained

²⁰The linear hypothesis test shows that the coefficients for PSI and BI statistically differ from each other (p-value: 0.033).

Table 3: Bonus/Profit-sharing Intensity and Job Satisfaction

	(1) OLS	(2) FE	(3) OLS	(4) FE
PSI	0.012*** (0.003)	0.007** (0.003)		
BI	0.034*** (0.004)	0.015*** (0.003)		
BI (categorical)				
BI ∈ (0, 0.44]			0.049*** (0.009)	0.036*** (0.008)
BI ∈ (0.44, 1.04]			0.082*** (0.009)	0.045*** (0.008)
BI ≥ 1.04			0.099*** (0.011)	0.049*** (0.010)
PSI (categorical)				
PSI ∈ (0, 0.19]			-0.010 (0.015)	0.010 (0.012)
PSI ∈ (0.19, 0.88]			0.026** (0.013)	0.019* (0.010)
PSI ≥ 0.88			0.075*** (0.018)	0.044*** (0.015)
Num.Obs.	234230	234230	234230	234230
R2 Adj.	0.029	0.398	0.029	0.398
R2 Within		0.031		0.031

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany. The sample covers the years between 1985-2020. Columns 1 and 2 use the continuous measure and columns 3 and 4 the categorical definition. The sample covers the years from 1985 to 2020. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

by increasing BI (PSI) by 0.54 (0.29) - or one standard deviation - which translates into 1316.56€ (701.84€). As a result, companies might shift roughly 110€ (58€) per month towards the yearly bonus (profit-sharing payment) for the average worker, resulting in improved levels of job satisfaction without paying additional income.

Looking at the intensity distribution (columns 3 and 4), further differences between bonuses and profit-sharing payments occur. The positive association of bonus payments and job satisfaction increases with (relative) size, showing significant coefficients throughout the distribution. However, the increase in coefficients is only marginal, especially when moving between the last two quantiles. The positive relationship between BI and job satisfaction appears primarily due to the incidence of such a payment. On the contrary, smaller profit-sharing payments do not affect job satisfaction. For PSI values up to 0.19, there is no significant association with job satisfaction in the FE model and even a negative (but insignificant) effect in the OLS specification without FE. Even for the second category (intensity up to 0.88), I only find a weak significant association with job satisfaction (column 4). The PSI coefficients have significantly lower economic significance than the BI coefficients, particularly in the first two categories. The significant relationship between PSI and job satisfaction (column 2) is driven primarily by higher profit-sharing payments ($PSI \geq 0.88$). In economic terms, the results display that a worker

with a constant income and comparably more significant fraction of bonus (profit-sharing payments) reports on average 0.049 SD (0.044 SD) higher levels of job satisfaction, which translates to 0.10 (0.87) on the job satisfaction scale, or 83% (75%) of the effect of working in the public sector.

To further analyze whether the effects for BI do not simply capture "incidence effects," the model can be re-specified by including both a dummy for the incidence of bonus (profit-sharing) payments and the intensity measures (see Table A4). The findings confirm what has been found so far: while the incidence of bonuses largely captures the overall effect presented in this section for bonuses, especially in the specification including individual fixed effects, the results for profit-sharing indicate that it is more about the payments' size, as only the PSI interaction terms show a significant coefficient in the OLS specification.²¹ It appears that profit-sharing payments only matter when they are "big enough," which strengthens the findings of Pouliakas (2010) that employers should be careful in introducing incentives that are too "small." In addition to the author's findings, this seems accurate, even if wages are held constant. Furthermore, the results highlight the importance of distinguishing between bonuses and profit-sharing payments, as workers' responses to payment size vary. Small monetary gifts may be less likely to be perceived as payments if viewed as a gesture of trust and reward in the form of a monetary gift (or bonus).

The results presented in Table 3 (including individual FE) are robust to a number of adjustments in the intensity measure (see Table A5). I focus on the most complete specification including individual FE and look at the continuous measure of intensities.²² First, I exclude 13th and 14th salaries when calculating the bonus intensity measure to address concerns about a worker's response to such payments. Both types of payment may not be paid at the employer's discretion every year but rather as one fixed component of the wage package. Hence, those payments may not reflect the characteristics of a monetary gift. Compared to the baseline estimates, the results show a decrease in the coefficient size (columns 1 and 2). Nonetheless, there is a positive relationship between BI and job satisfaction. Furthermore, I argue that 13th and 14th salaries may be formally different from vacation or other bonuses. In practice, however, Christmas bonuses and 13th salaries could be perceived as similar as they are paid at the same point in time. As a result, they may still be viewed as a monetary gift by employees and are essential when constructing the BI measure.

²¹Despite being insignificant, the FE coefficient of the interaction falls just short of the 10 percent significance level (p-value = 0.102), while the dummy remains insignificant

²²All the sensitivity checks including the categorical measure show qualitatively the same results and can be obtained from the author upon request.

Next, I include a squared term of BI and PSI to capture non-linear effects at the top end of the distribution (columns 3 and 4). Employees may perceive greater earnings risk if the fraction of bonus or profit-sharing payments becomes too large, especially if the payment is not guaranteed. As a result, one may anticipate a negative coefficient in the squared intensities. However, despite the fact that the squared term has negative coefficients for both BI and PSI, they are statistically insignificant and provide no clear indication of whether the effect differs towards the right tail of the distribution.

Last, as mentioned in section 3, the intensity components do not align in time. As a result, instead of earnings from previous months, I use the average monthly earnings of the prior calendar year as the denominator in the BI/PSI calculation. However, the information has some limitations: First, it requests the previous calendar year's average monthly earnings, which may cause reporting bias. Second, the data does not indicate whether or not a bonus or profit-sharing payments are included, making it impossible to disentangle the effect beyond an income effect. Finally, information is missing until 1990, reducing the sample size. Still, the restricted sample results (columns 5 and 6) confirm a positive relationship between BI/PSI and job satisfaction showing even higher coefficients.

5.4 Effect Heterogeneity

The effect of bonus and profit-sharing payments on job satisfaction may be contingent on specific characteristics. This section examines critical factors identified in prior research on performance pay and gift exchange, aiming to illuminate distinctions between these forms of compensation and the mechanisms in which they affect job satisfaction. To accomplish this, in the upcoming analysis I use the continuous BI/PSI measure and interact it with various individual and job-related characteristics.²³ The results are displayed in Figure A1 for the former and in Figure 3 for the latter characteristics. The full output, including all the coefficients, can be found in Table A6.

5.4.1 Individual Characteristics

Risk-Tolerance Higher fractions of variable pay may be associated with higher levels of income risk. In line with that suspicion, previous studies on variable pay (Cadsby et al., 2007; Grund and Sliwka, 2010, e.g.)²⁴ find that such payments are perceived as less beneficial for risk-averse employees, as they

²³A large number of interaction terms are produced by the categorical intensity measure. As a result, I rely on the continuous measure here for illustration purposes. However, previous results on bonus/profit-sharing distribution apply here as well. For example, heterogeneous effects for bonuses apply across the entire intensity distribution, whereas heterogeneous effects for profit-sharing payments are mostly driven by larger payments. All results can be obtained by the author upon request.

²⁴Note that those studies mainly focus on the incidence of individual performance pay measures. However, if base wages are comparably low, the rationale of more uncertainty should also apply to profit-sharing payments.

want to avoid bearing additional earnings risk. For bonuses, the link may be twofold. If bonuses are not guaranteed, risk-averse individuals may find a higher intensity of them less appealing than risk takers, as it brings more income uncertainty. On the other hand, if workers do not associate any additional earnings risk with the bonus but instead perceive it as guaranteed, then the individual's risk adversity should have no moderating role. Given those reasons, I expect a stronger positive relationship between PSI and job satisfaction for risk lovers, while the moderating role of risk adversity is a priori uncertain for bonuses.

In the GSOEP, individuals were asked to state their willingness to take risks from 0-10.²⁵ I define a respondent as a risk taker if the reported risk tolerance exceeds the sample median. The results (Figure 2a) do not confirm the expectation mentioned above, as the interaction coefficients for both BI and PSI with the risk-taking dummy do not differ statistically from zero, implying that (unconditional) bonuses and profit-sharing payments may not be associated with additional earnings risk. Figure A1a verifies this result, showing that workers with the lowest level of risk-taking (first quartile of the distribution) do not differ statistically from those with greater reported risk levels (final quarter of the distribution).

Reciprocity While the moderating role of risk adversity is typically analyzed in the context of performance pay, literature on gift exchange emphasizes the role of individual workers' reciprocity to evaluate the effectiveness of (monetary) gifts. In simple words, reciprocity can be defined as responding kind to kindness (positive reciprocity) and unkind to unkindness (negative reciprocity) (see Perugini et al., 2003). In line with gift-exchange theory by Akerlof (1982), (monetary) gifts may lead to reciprocity between employer and employee. In other words: If workers receive a (monetary) gift as a form of trust or reward, they may respond by returning the gift, increasing both employees' and employers' utility. If that mechanism applies to bonus and profit-sharing payments, too, then workers that are more reciprocal in general should benefit more from a monetary gift than workers that are somewhat unwilling to return gifts.²⁶ Still, as the incidence of the payment of profit-sharing depends on a specific performance outcome at the end of the year, one may not perceive such payments as "real" gifts. With that, one would expect higher levels of bonus intensity to be more effective for workers more likely to reciprocate, while for PSI, the moderating role of reciprocity is a priori uncertain.

In the GSOEP information about individual reciprocity is available in eight years between 2005-2020. On a seven-point Likert scale, participants are asked to rate how well six statements (three for

²⁵The question was asked from 2004-2020, except in 2005.

²⁶Indeed, Perugini et al. (2003) states that positive reciprocators are expected to be especially sensitive to positive interpersonal behaviors.

Figure 2: Heterogenous Effects - Individual Characteristics

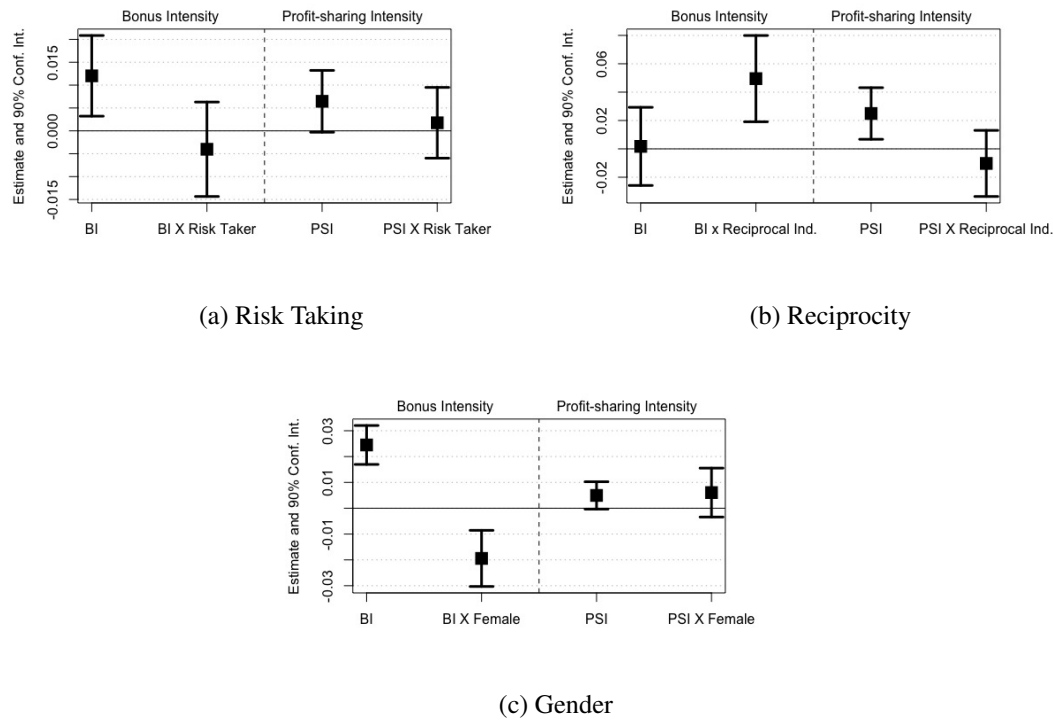


Figure notes: The figures present the moderating role of individual characteristics in the relationship between BI/PSI and job satisfaction. The sub-figures show the main and interaction coefficients, as well as their corresponding confidence intervals. The exact coefficients can be found in Table A6.

positive, three for negative reciprocity) apply to them. In this study, I focus on positive reciprocity and define the measure following Dohmen et al. (2008) and Gauly (2017) as the average value of the three statements. Then I define someone as reciprocal if the average value of the three questions exceeds the sample median. The results (Figure 2b) indicate that positive reciprocators drive previous results for BI as the overall effect for that group ($0.02 + 0.05 = 0.07$) is more than four times larger than the initial coefficient shown in Table 3. Strikingly, those employees that report lower levels of positive reciprocity show no positive relationships between BI and job satisfaction on average. In contrast, PSI coefficients are not moderated by reciprocity. Overall, the results strengthen the above hypothesis that bonuses are perceived as a monetary gift enhancing the positive effects for reciprocal workers. Furthermore, the results hold true when looking at a more detailed categorization of reciprocity: While the positive relationship of BI and job satisfaction increases rather linearly with the level of reciprocity, the PSI coefficient remain stable as interaction terms are statistically insignificant even for the highest levels (4th quartile of the reciprocity distribution).

Gender Gender differences may moderate the relationship between intensities and job satisfaction, as they also capture differences in the abovementioned factors. If women take lower risks on average

(see Carter et al., 2017, for evidence on executives) due to, for example, selection into less competitive environments in jobs with lower fractions of variable pay (Socin and Socin, 2019)²⁷, then the correlation of profit-sharing/bonus payments and job satisfaction is expected to be lower compared to men. Whether gender differences also capture differences in reciprocity is uncertain²⁸ and the data does not show a statistically significant difference here. Overall, the moderating role of gender in the perception of bonus and profit-sharing payments is a priori uncertain.²⁹ The analysis of the estimates (Figure 2c) exposes a noteworthy distinction in the evaluation of bonus payments contingent on gender. Specifically, the main coefficient (approximating 0.15) of the entire sample (Table 3) is driven by males with a sizeable BI coefficient for that group amounting to 0.24. Yet, females exhibit only a small positive relationship between BI and job satisfaction ($0.24 - 0.19 = 0.05$). Furthermore, the correlation between PSI and job satisfaction is not moderated by gender.

5.4.2 Job and Firm Characteristics

Sector and Company Size Small businesses frequently have more latitude when it comes to compensation and benefits, so they may be able to customize bonuses to meet their employees' unique requirements and preferences. In contrast, the employer has less discretion in larger companies, as bonuses and profit-sharing payments are often negotiated on the union level, via collective wage agreements or by the works council.³⁰ In large companies, this may result in bonuses not tailored to the specific employee's needs and preferences, which may result in lower levels of job satisfaction. The latter argument can be extended to the public sector, where bonuses and profit-sharing payments are more likely to be bargained on a collective wage basis.³¹ Furthermore, based on the concepts of intrinsic and extrinsic motivation (see Frey et al., 1997), studies have shown that public sector employees are less extrinsically motivated than their private sector counterparts (e.g. Buelens and Van den Broeck, 2007; Judge et al., 2010; Pouliakas, 2010; Georgellis et al., 2011; Coccia and Igor, 2018). Overall, the relationship between

²⁷In the restricted sample, including information on the willingness to take risks, women report an of 4.4 (on a scale from 0-10), compared to men with 5.2.

²⁸E.g., Dittrich (2015) finds that women are less likely to reciprocate, while Buchan et al. (2008) states the opposite.

²⁹The empirical literature presents mixed results for profit-sharing payments (e.g. Brown and Sessions, 2003; Heywood and Wei, 2006; Donohue and Heywood, 2004; Dohmen and Falk, 2011).

³⁰In the GSOEP, information on such institutions is only available for a limited number of years (10 years for trade union membership, six years for collective wage agreements and five years for works council). However, using only those years' samples reveals that employees in companies with at least 2000 employees are 76% likely to be covered by wage agreements, 34% in a trade union, and 91% have works council representation in their current firm, whereas, in smaller firms with fewer than 2000 employees, the probabilities are 51%, 18%, and 50%, respectively.

³¹In the restricted samples, public sector employees are more likely than private sector employees to be subject to the aforementioned institutions (87% versus 49%), to be trade union members (28% versus 20%), and to have a works-council (90% versus 49%) at their place of work.

intensities and job satisfaction is likely to be stronger in smaller companies and the private sector for both profit-sharing and bonus payments.

Figure 3: Heterogenous Effects - Job Characteristics

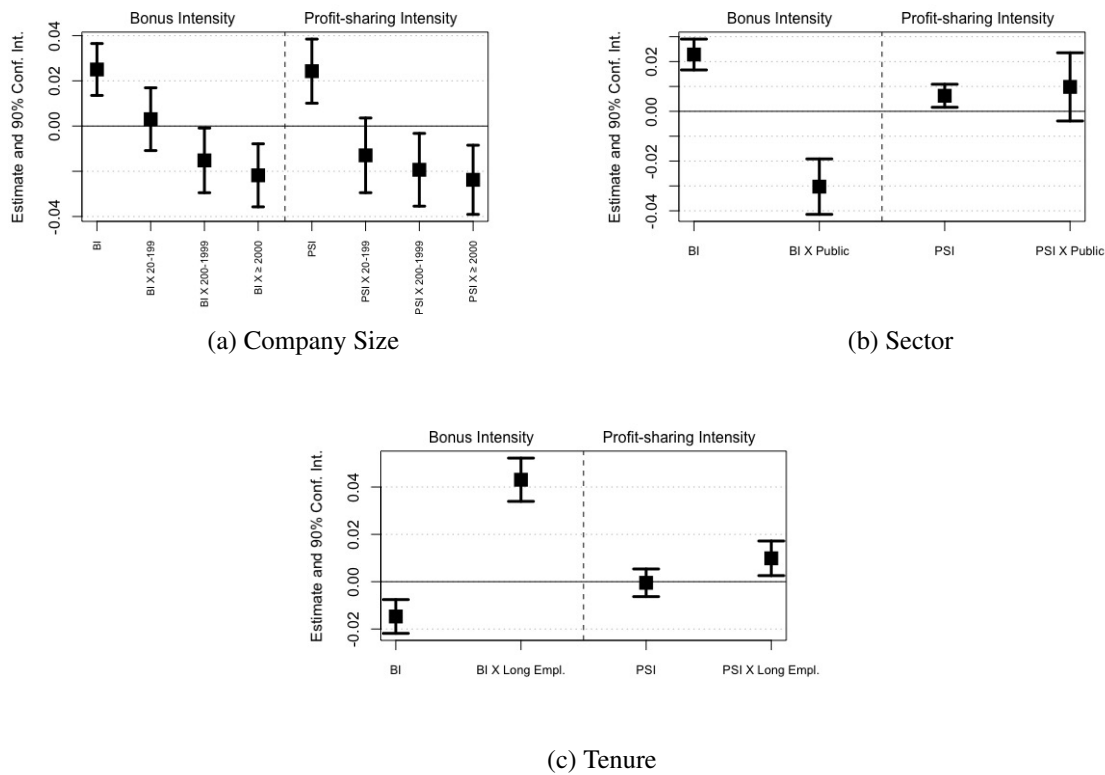


Figure notes: The figures present the moderating role of job and firm characteristics in the relationship between bonus incentive (PSI) and job satisfaction. The sub-figures show the main and interaction coefficients, as well as their corresponding confidence intervals. The exact coefficients can be found in Table A6.

The findings (Figure 3a and 3b) mainly support this expectation, as the coefficients for PSI and BI decrease with increasing company size. Especially in large companies (≥ 2000 employees), there is an economically negligible relationship between BI (PSI) and job satisfaction as the interaction coefficients offset the base coefficients.³² Consequently, the positive relationship in the baseline results is mainly driven by employees in small companies. Turning to the sector differences, Figure 3b shows that BI is irrelevant and even negatively associated with job satisfaction in the public sector ($0.023 - 0.030 = -0.070$) and the baseline estimates are driven by private sector employees. This supports the idea that external motivators are less effective in the public sector. The results for PSI do not show any difference based on sector.

³² $BI + BI X \geq 2000 = 0.025 - 0.022 = 0.003$ and $PSI + PSI X \geq 2000 = 0.024 - 0.024 = 0$. The the results for PSI strengthen Artz (2008)'s findings that profit-sharing has no effect in medium to large firms.

Tenure As a sign of appreciation for a worker's commitment to the firm and to prevent workers from seeking other job opportunities, employers in Germany can offer bonus payments, the frequency and size of which may vary depending on the employee's tenure.³³ Firms may also distribute a larger share of profits to employees with longer tenure, though this is less likely in practice. The GSOEP data offers some support for both types of payments: Employees with longer tenure (over the sample median of 8 years) have a higher incidence (0.81 versus 0.62 for bonuses and 0.12 versus 0.09 for profit-sharing payments) and a higher average intensity (0.69 versus 0.46 for BI and 0.08 versus 0.05 for profit-sharing payments) in the estimation sample compared to workers with shorter tenure. If workers with more tenure are more likely to receive "special treatment" in the form of bonuses or a larger share of profits, the relationship between bonuses and job satisfaction may be particularly strong for that group. An opposing notion is that people become accustomed to receiving bonuses, diminishing the gift nature of such payments.

To analyze the relationship of interest, I define a dummy variable that is equal to one when an employee reports longer tenure than the sample median (referred to as "long empl."), and zero otherwise. The results in Figure 3c indicate that tenure moderates the relationship between BI and job satisfaction: employees with tenure below the median display a negative relationship between BI and job satisfaction (BI coefficient), while those who have been employed for a longer time show a positive relationship (BI + BI X Long. Empl. = -0.015 + 0.043 = 0.028). Though smaller in magnitude, a similar pattern is also present for profit-sharing payments.

In sum, moderating effects show that previous findings on BI are driven by males, positive reciprocators, workers who have been employed for a longer period of time, work in the private sector, and work in smaller companies, whereas workers in smaller companies primarily drive PSI coefficients. Hence, the findings support the notion that (unconditional) bonuses follow different mechanisms than typically found for incentives, such as profit-sharing. Therefore, it underlines the importance of distinguishing between such payment types. Especially for the aforementioned sub-groups, bonuses may be a valuable alternative to performance-pay schemes in motivating employees.

³³For example, "Jubiläumsgeld," regulated in section 34 of the Tarifvertrag-V (collective agreement), is a legal entitlement for public sector employees in state and municipal administrations, specifically upon reaching 25 years of employment, they receive a payment of 350 Euro. Upon reaching 40 years of employment, they receive a payment of 500 Euro. Part-time employees receive the full amount as well.

6 Addressing Endogeneity Issues

In this section, I examine whether the main findings are robust to a variety of modifications. First, in section 6.1, I employ an instrumental variable approach based on aggregation. Furthermore, in section 6.2, I account for other control variables related to the firm, occupation or to other salary components that could be a source of omitted variable bias in the initial estimates.

6.1 Instrumental Variables

As shown earlier, the relationship of bonuses and job satisfaction is mainly explained by the incidence of such payments. In contrast, for profit-sharing, a strong correlation was observed only for medium to large amounts. Therefore, the aggregate bonus instrument (see, section 4.2) is based on the incidence of bonuses of other workers in the same industry and year (bonus density), while the profit-sharing instrument is based on the prevalence of medium to large payments, meaning that I instrument a workers incidence of receiving a medium or large bonus³⁴ by the incidence of medium to large payments (PS density) of other workers within the same industry and year.

The full sample IV estimates (see Table 4) show a positive relationship between bonus density (PS density) and the respective endogenous variable, confirming that the first stage exists. The F-Statistics denoting way above the critical value of 10 show that the instrument is sufficiently strong in both the 2SLS and IVFE specifications and for both instruments. In the second stage, bonus incidence confirms a positive relationship with job satisfaction. At the same time, the prevalence of medium to large profit-sharing payments is statistically insignificant in both 2SLS and IVFE specifications. This implies that the intensity of profit-sharing payments may correlate with other unobservables and has no effect on job satisfaction, even if the payment is large.

As the validity of the exclusion restriction can not be tested formally and usually gives rise to debate, I perform several tests to enhance the credibility of the results. All robustness tests focus on the most comprehensive specification, the IVFE estimates.

Ensuring valid cell-means Because the industry-year cell means could be calculated using only a few observations, the procedure may undermine the instrument's validity. As a result, I limit the sample to cell means calculated from at least ten observations to ensure sufficient identification. The findings for

³⁴The instrumental variable dummy takes the value 1 if PSI exceeds 0.19 and zero otherwise.

Table 4: Bonuses/Profit Sharing and Job Satisfaction - IV Estimates

dep. Var	2SLS			IVFE		
	First Stage		Second Stage	First Stage		Second Stage
	Bonus	Pofit-sharing	Job Sat.	Bonus	Profit-sharing	Job Sat.
Bonus Density	0.072*** (0.003)	-0.008*** (0.001)		0.041*** (0.003)	0.000 (0.001)	
PS Density	-0.016*** (0.002)	0.047*** (0.001)		-0.005*** (0.002)	0.019*** (0.002)	
B (0/1)			0.569*** (0.077)			0.738*** (0.154)
PS (0/1)			0.032 (0.082)			-0.020 (0.247)
F-Statistics	1,296.0	2,005.2		263.2	176.8	
Num.Obs.	234158	234158	234158	234158	234158	234158

Table notes: The table shows the effect of bonus and profit-sharing payments on job satisfaction using instruments based on aggregation. The sample covers the years from 1985 to 2020. The instrument is defined as the industry-year-specific density of bonus and profit-sharing payments. The latter only includes payments that are relatively large, i.e., with a profit-sharing intensity exceeding 0.19. Small payments below that threshold are treated as no payment. Additional control variables are the same as in Table 2. The standard errors are clustered at the nace-year level in line with the instrument specification. * p < 0.1, ** p < 0.05, *** p < 0.01

IVFE (Table A8, Panel A) confirm a positive and significant relationship between the bonus incidence and job satisfaction.³⁵

Alternative instrument specifications The PS instrument’s definition may raise concerns about the loss of within-person variability. Fewer people may switch from receiving no or small PS payments to receiving a ”large” payment (and vice versa). IVFE may not work if there is insufficient variation, which could explain the ”no results” for profit-sharing on job satisfaction. Therefore, I define $z_{2,i,t}$ as the average PSI of others for each nace-year cell. The continuous variable should provide enough variation to identify the within-person effects. The results (Table A8, Panel B) still show no effect of PSI and a positive effect of bonus density on job satisfaction.

Including a more detailed industry control Even though the IVFE specification includes broad-level industry controls, the significant results for bonus payments may still stem from the fact that the instrument’s inclusion measures industry differences on a more detailed level, as it is defined on the year-nace level. Hence, in Table A8, Panel C, Dummies for each nace (2-digit) classification are used as a control variable to account for industry-year differences captured by the instrument. The results remain qualitatively unchanged, with a positive coefficient for bonus payments and a null result for profit-sharing payments.

³⁵I also re-estimated the IVFE for those with $n = 20$ and $n = 30$. The results are robust and can be received from the author upon request.

Overall, I discover a positive relationship between bonus incidence and job satisfaction that is robust to the adjustments of the instrument. Profit-Sharing, conversely, does not produce results that differ significantly from zero, potentially due to reasons found in the next sections.

6.2 Additional Control Variables

The results of previous section suggest that PSI coefficients may be subject to omitted variable bias. Hence, in this section I will highlight some of the potential sources. The main estimates presented in section 5 have considered individual FE and a large number of control variables, however, the correlation may capture other effects. First, a variation in BI (PSI) and job satisfaction may stem from a firm switch. Previous estimates of BI and PSI may thus be correlated with those unobserved factors associated with the new firm, i.e., the error term. Second, even if the initial switch is unimportant, bonus and profit-sharing payments, as well as their relative size, are likely to differ between firms, their economic situation and occupational differences. Last, the initial estimates only account for part of the wage package and other performance-related pay measures as well as non-monetary benefits, that change over time, may be captured by the initial estimates. To study if and how the main coefficients change I include additional control variables for all these and restrict the sample to years were the respective information is available. All estimations use the main OLS specification including individual fixed effects.³⁶

Firm and Occupational Characteristics A job change may affect workers job satisfaction³⁷ and likely causes a change in bonus and profit-sharing payments. The panel structure of the data allows to identify switchers by leveraging that workers' tenure is available in all the interview periods. I define a switcher if their reported tenure in the current interview is below their reported tenure in the previous interview plus the passage of time. With that, approximately 26% of employees (10,973 out of 42,131) are classified as switchers at least once during the observation period. I include the dummy as additional control variable. Following that, I define a specific worker-firm ID and include worker-in-firm FE to capture all the (time-invariant) firm characteristics.³⁸ The results in Table A7 show slightly larger coefficients when accounting for a switch in firms (columns 2 and 5) than in the baseline specifica-

³⁶Note that the IV estimates cannot be used, as the sample sizes become too small especially when including additional compensation information.

³⁷For instance, Chadi and Hetschko (2018) show that the reason of previous job quits strongly affects job satisfaction in the new job.

³⁸As an additional robustness test, I limit the sample to those that report a tenure larger than one, which accounts for potential measurement error in the intensity variables, as employees may report gross earnings from their current employer as well as bonus/profit-sharing payments from their previous employer. With that, I find that there is still a positive and significant relationship between BI (PSI) and job satisfaction. The results are available upon request.

tion (columns 1 and 4), indicating potential downward bias in the previous estimates. For example, a higher PSI/BI may be offset by the new firm's poorer working conditions. When worker-in-firm FE are included, the estimates fall below the initial level (columns 3 and 6). Furthermore, medium-sized profit-sharing payments even lose statistical significance, and only large payments show a significant association. What the results suggest is that previous findings are sensitive to firm-switch controls and unobserved worker-firm characteristics. Ignoring the former will result in a downward bias and ignoring the latter will result in an upward bias in the baseline estimates. Nonetheless, especially the initial estimates for bonus payments hold when accounting for such factors, with both BI coefficients indicating a positive relationship with job satisfaction. Again, the final standardized coefficients show that bonuses are perceived to be more advantageous than profit-sharing payments in determining workers' job satisfaction.

Next, I account for the fact that the provision of bonuses or profit-sharing payments is contingent on the firm's economic success. The data allows to proxy of the current firm's economic situation. For that purpose, I use a variable asking whether the firm's number of employees decreased, remained or increased compared to previous year. If firms are in a dire economic situation (approximated with a decrease in the number of employees in the previous year), it is less likely that they pay bonuses or share the profits and also job satisfaction of workers should be lower in those years. Hence initial BI/PSI coefficients may capture the general economic situation of the firm. The information on the change of number of employees is only available in a restricted number of years. Hence the sample size shrinks to 68,724. The results are presented in Table A9. Columns 1 and 3 contain OLS specifications, while columns 2 and 4 include individual fixed effects. The continuous intensity measure (Panel A) results show that a decline or no change in the number of employees (the baseline category is an increase in the number of employees) correlates negatively with job satisfaction. Furthermore, the inclusion of that control variable reduces the PSI coefficients in both OLS and fixed effects specifications. As a result, the PSI coefficient turns even insignificant in OLS specifications. Despite the fact that all of the coefficients for the categorical specification of PSI (Panel B) are statistically insignificant, the shift in coefficients demonstrates that the results is consistent across the distribution. The coefficients for BI are similarly altered, but to a lesser extent and they remain significant, irrespective of the model or variable specification. The findings suggest that especially the profit-sharing coefficient may reflect a firm's economic situation: if a firm is doing well, it is more likely to share its success with its employees. A worker's high profit-sharing intensity may thus simply reflect the firm's economic success, resulting in upwardly biased estimates.

Finally, employees may stay in the same firm but switch between occupations. The 1-digit ISCO control partly captures this, however, only to a weak extent. I address occupational characteristics that may be correlated with bonuses/profit-sharing schemes and job satisfaction. To do so, I include a more detailed level of occupation (ISCO88 3-digit) in the model, but the results indicate no difference in the coefficients.³⁹

Other Wage Components While the estimates presented so far, include some wage components other parts of the work agreement may be relevant, too. Larger BI and PSI may indicate that employees work for a "good" employer, potentially providing many benefits. The estimates in the preceding section capture this only if the benefits remain constant over time. GSOEP provides information on whether employees received fringe benefits⁴⁰ and additional bonuses⁴¹ in the previous month. The information is available in 9 years between 2006 and 2020. Furthermore, besides bonus payments, group incentives and fringe benefits, firms can also rely on more individualized performance pay measures that are known to affect job satisfaction (see Heywood and Wei, 2006; Artz, 2008; Cornelissen et al., 2011). Information performance pay is available in the GSOEP in four survey years (2004, 2008, 2011, and 2016).⁴² In those years, employees are asked whether their "own performance [is] regularly assessed by a superior as part of an agreed procedure" and whether "[...] this performance assessment influences ... (1) monthly gross wages ?, (2) a yearly bonus, (3) future salary increases, (4) potential promotion". Following Grund and Sliwka (2010), Cornelissen et al. (2011) and Baktash et al. (2022a), I define a dummy taking value 1 if the performance is regularly assessed and has any impact on the employee's earnings (meaning that (1), (2) or (3) is answered in the affirmative).

The results for OLS estimates without and with individual FE are displayed in Table A10 and Table A11, respectively.⁴³ Table A10, Panel A shows that the initial BI coefficients only marginally decrease when including control variables capturing the prevalence of fringe benefits (column 2), additional bonuses (column 3) and performance pay (column 5). This result could arise if bonuses are paid as a substitute for other firm-specific benefits. On the other hand, the PSI coefficient decreases after adding additional control variables and loses significance when including information about performance pay.

³⁹Results are not displayed here but can be obtained from the author upon request.

⁴⁰Includes discount for meals, company vehicle, phone, expense allowance, personal computer and other forms of additional benefits.

⁴¹Includes shift bonus, overtime pay, difficult condition bonus, added responsibility bonus, tips and other supplements.

⁴²Note that the measure may also include group-related performance pay.

⁴³I provide both specifications, because in the restricted samples, the number of observations shrinks to 81,064 when including information about fringe benefits and additional bonus payments and to only 23,338 when information about performance pay is included. Hence, individual FE estimates may not provide enough within variation.

Other payments' prevalence appears to correlate with PSI, leading to an upward bias in the initial estimates. One could also say if the company is doing well (and pays a larger profit-sharing payment), then it is likely that it will provide additional fringe benefits, bonuses or performance-related payments, increasing workers' job satisfaction. Importantly, Panel B shows that the categorical BI coefficients remain similar and PSI coefficients decrease when adding additional control variables, irrespective of the magnitude of BI/PSI. When individual FE are added, the results reveal reduced overall significance in the restricted sample, but qualitatively the same result.

Overall, when additional (time-invariant) information on firm and occupational characteristics are included, both BI and PSI coefficients are fairly robust and leave no indication that initial estimates capture such characteristics. However, initial PSI coefficients seem to capture - to some extent - the current firms economic situation and information on other compensation components highlighting some of the sources of omitted variable in the initial estimates.

7 Conclusion

In this study, I shed light on a worker's job satisfaction response to monetary gifts (unconditional bonuses) as opposed to incentives (profit-sharing payments). Where prior research using survey data have fallen short due to data constraints, the data employed in this study allows for a clear differentiation between these payment types and the underlying mechanisms. I employ a number of estimation strategies including individual fixed effects, worker-in-firm fixed effects and instrumental variable approaches.

The results of this study show that for an employee with a constant total income, both the incidence and intensity, precisely, the level of bonuses and profit-sharing payments w.r.t. the base wage, are associated with higher levels of job satisfaction. In the baseline specification, a one standard deviation increase in bonus intensity (profit-sharing intensity) equals 25% (10%) of the effect of working in the public sector. Consequently, the relationship is statistically and economically significant given that it indicates what goes beyond an employee's income effect in response to the bonus or profit-sharing payment. Shifting roughly 110€ (58€) per month from gross earnings to the annual bonus (profit-sharing) payments can result in the aforementioned boost in job satisfaction for the average worker in the sample examined. However, the initial results hide an important difference: While both small and large bonuses positively correlate with job satisfaction, only larger intensities show significant results for profit-sharing payments. Thus, in contrast to previous research, the advice "pay enough, or don't pay

at all” is confirmed only for profit-sharing payments but not for unconditional bonuses. Furthermore, the profit-sharing estimates lose statistical power when extending the baseline fixed effect estimations by including additional control variables or using time-variant instrumental variables. For the instruments, the findings show no relationship between profit-sharing payments and job satisfaction even if the payment is larger. However, the instrumental variable specifications support the baseline individual fixed effects estimates for bonuses. Finally, for bonuses, the positive relationship with job satisfaction is particularly strong for men, reciprocal workers, workers in the private sector and workers in small companies. For profit-sharing, only the latter factor moderates the relationship positively.

The reader of this study should be aware the results do not provide causal evidence due to the lack of exogenous variation in the independent variables. However, given the variety of estimation strategies and the consistent differences in the results for bonuses and profit-sharing payments in both the direct relationship with job satisfaction and the underlying mechanisms, this study emphasizes that researchers should carefully distinguish between incentives and monetary gifts. Finally, it implies that even small monetary gifts may be a valid alternative to incentives such as profit-sharing schemes in boosting employees job satisfaction.

References

- Akerlof, G. A. (1982). Labor Contracts as Partial Gift Exchange. *The Quarterly Journal of Economics*, 97(4):543–569.
- Allan, J. L., Andelic, N., Bender, K. A., Powell, D., Stoffel, S., and Theodossiou, I. (2021). Employment Contracts and Stress: Experimental Evidence. *Journal of Economic Behavior & Organization*, 187:360–373.
- Artz, B. (2008). The Role of Firm Size and Performance Pay in Determining Employee Job Satisfaction Brief: Firm Size, Performance Pay, and Job Satisfaction. *Labour*, 22(2):315–343.
- Artz, B. (2010). Fringe Benefits and Job Satisfaction. *International Journal of Manpower*, 31(6):626–644.
- Artz, B. and Heywood, J. S. (2015). Performance Pay and Workplace Injury: Panel Evidence. *Economica*, 82:1241–1260.
- Baktash, M. B., Heywood, J. S., and Jirjahn, U. (2022a). Performance Pay and Alcohol Use in Germany. *Industrial Relations: A Journal of Economy and Society*, 61(4):353–383.
- Baktash, M. B., Heywood, J. S., and Jirjahn, U. (2022b). Worker Stress and Performance Pay: German Survey Evidence. *Journal of Economic Behavior & Organization*, 201:276–291.
- Bellemare, C. and Shearer, B. (2009). Gift Giving and Worker Productivity: Evidence from a Firm-level Experiment. *Games and Economic Behavior*, 67(1):233–244.
- Bender, K. A., Donohue, S. M., and Heywood, J. S. (2005). Job Satisfaction and Gender Segregation. *Oxford Economic Papers*, 57(3):479–496.
- Bender, K. A. and Theodossiou, I. (2014). The Unintended Consequences of the Rat Race: The Detrimental Effects of Performance Pay on Health. *Oxford Economic Papers*, 66(3):824–847.
- Bhatti, K. K. and Qureshi, T. M. (2007). Impact of Employee Participation on Job Satisfaction, Employee Commitment and Employee Productivity. *International Review of Business Research Papers*, 3(2):54–68.
- Bogliacino, F., Grimalda, G., and Pipke, D. (2021). Kind or Contented? An Investigation of the Gift Exchange Hypothesis in a Natural Field Experiment in Colombia. Technical report, Kiel Working Paper.

- Brown, S. and Sessions, J. G. (2003). Attitudes, Expectations and Sharing. *Labour*, 17(4):543–569.
- Bryson, A., Clark, A. E., Freeman, R. B., and Green, C. P. (2016). Share Capitalism and Worker Wellbeing. *Labour Economics*, 42:151–158.
- Buchan, N. R., Croson, R. T., and Solnick, S. (2008). Trust and Gender: An Examination of Behavior and Beliefs in the Investment Game. *Journal of Economic Behavior & Organization*, 68(3-4):466–476.
- Buelens, M. and Van den Broeck, H. (2007). An Analysis of Differences in Work Motivation Between Public and Private Sector Organizations. *Public Administration Review*, 67(1):65–74.
- Cadsby, C. B., Song, F., and Tapon, F. (2007). Sorting and Incentive Effects of Pay for Performance: An Experimental Investigation. *Academy of Management Journal*, 50(2):387–405.
- Cadsby, C. B., Song, F., and Tapon, F. (2016). The Impact of Risk-Aversion and Stress on the Incentive Effect of Performance-pay. In *Experiments in Organizational Economics*. Emerald Group Publishing Limited.
- Carter, M. E., Franco, F., and Gine, M. (2017). Executive Gender Pay Gaps: The Roles of Female Risk Aversion and Board Representation. *Contemporary Accounting Research*, 34(2):1232–1264.
- Chadi, A. and Hetschko, C. (2018). The Magic of the New: How Job Changes Affect Job Satisfaction. *Journal of Economics & Management Strategy*, 27(1):23–39.
- Charness, G. (2004). Attribution and Reciprocity in an Experimental Labor Market. *Journal of Labor Economics*, 22(3):665–688.
- Chen, C.-A. (2018). “A Little is Better than Zero” or “Pay Enough or Don’t Pay at All”? Evidence on the Size of Pay-for-Performance Across the Sectors. *Public Personnel Management*, 47(2):119–143.
- Choi, J. (2014). Can Offering a Signing Bonus Motivate Effort? Experimental Evidence of the Moderating Effects of Labor Market Competition. *The Accounting Review*, 89(2):545–570.
- Clark, A. E., Mavromaras, K., and Wei, Z. (2015). Happy to Stay: Job Satisfaction and Retirement. In *Scottish Economic Society 2015 Annual Conference*.
- Coccia, M. and Igor, B. (2018). Rewards in Public Administration: A Proposed Classification. *Journal of Social and Administrative Sciences*, 5(2):68–80.

- Cornelissen, T., Heywood, J. S., and Jirjahn, U. (2011). Performance Pay, Risk Attitudes and Job Satisfaction. *Labour Economics*, 18(2):229–239.
- Currie, J., Lin, W., and Meng, J. (2013). Social Networks and Externalities from Gift Exchange: Evidence from a Field Experiment. *Journal of Public Economics*, 107:19–30.
- Dahl, M. S. and Pierce, L. (2020). Pay-for-performance and Employee Mental Health: Large Sample Evidence Using Employee Prescription Drug Usage. *Academy of Management Discoveries*, 6(1):12–38.
- De Ree, J., Muralidharan, K., Pradhan, M., and Rogers, H. (2018). Double for Nothing? Experimental Evidence on an Unconditional Teacher Salary Increase in Indonesia. *The Quarterly Journal of Economics*, 133(2):993–1039.
- Dittrich, M. (2015). Gender Differences in Trust and Reciprocity: Evidence From a Large-scale Experiment With Heterogeneous Subjects. *Applied Economics*, 47(36):3825–3838.
- Dohmen, T. and Falk, A. (2011). Performance Pay and Multidimensional Sorting: Productivity, Preferences, and Gender. *American Economic Review*, 101(2):556–90.
- Dohmen, T., Falk, A., Huffman, D., and Sunde, U. (2008). Representative Trust and Reciprocity: Prevalence and Determinants. *Economic Inquiry*, 46(1):84–90.
- Donohue, S. M. and Heywood, J. S. (2004). Job Satisfaction and Gender: an Expanded Specification From the NLSY. *International Journal of Manpower*, 25(2):211–238.
- Englmaier, F. and Leider, S. (2020). Managerial Payoff and Gift-exchange in the Field. *Review of Industrial Organization*, 56(2):259–280.
- Fehr, E. and Gächter, S. (2000). Fairness and Retaliation: The Economics of Reciprocity. *Journal of Economic Perspectives*, 14(3):159–181.
- Firth, L., Mellor, D. J., Moore, K. A., and Loquet, C. (2004). How Can Managers Reduce Employee Intention to Quit? *Journal of Managerial Psychology*, 19(2):170–187.
- Fisman, R. and Svensson, J. (2007). Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence. *Journal of Development Economics*, 83(1):63–75.

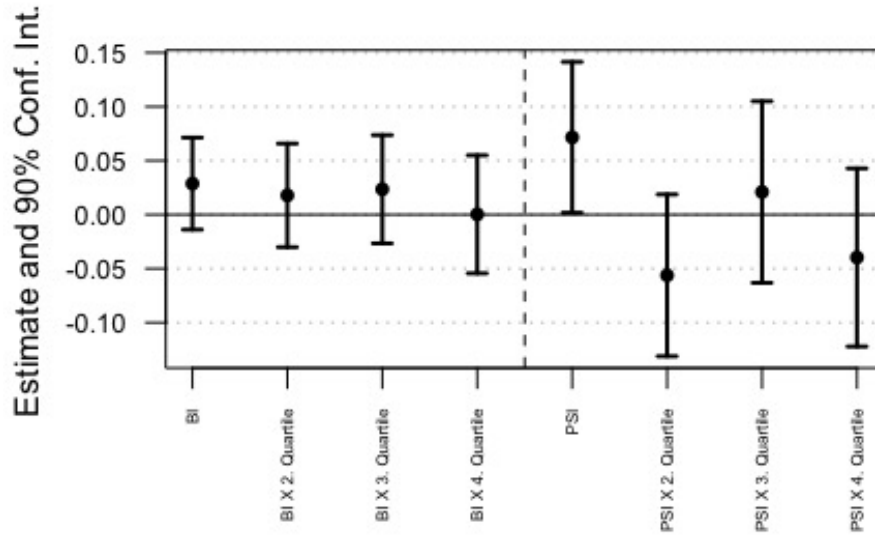
- Freeman, R. B., Blasi, J. R., and Kruse, D. L. (2010). Introduction to "Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing, and Broad-based Stock Options". In *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing, and Broad-based Stock Options*, pages 1–37. University of Chicago Press.
- Frey, B. S. et al. (1997). On the Relationship Between Intrinsic and Extrinsic Work Motivation. *International Journal of Industrial Organization*, 15(4):427–439.
- Ganzeboom, H. B. G. and Treiman, D. J. (2019). International Stratification and Mobility File: Conversion Tools.
- Gauly, B. (2017). The Intergenerational Transmission of Attitudes: Analyzing Time Preferences and Reciprocity. *Journal of Family and Economic Issues*, 38(2):293–312.
- Georgellis, Y., Iossa, E., and Tabvuma, V. (2011). Crowding Out Intrinsic Motivation in the Public Sector. *Journal of Public Administration Research and Theory*, 21(3):473–493.
- Gilchrist, D. S., Luca, M., and Malhotra, D. (2016). When $3 + 1 > 4$: Gift Structure and Reciprocity in the Field. *Management Science*, 62(9):2639–2650.
- Gneezy, U. and Rustichini, A. (2000). Pay Enough or Don't Pay at All. *The Quarterly Journal of Economics*, 115(3):791–810.
- Goebel, J., Grabka, M. M., Liebig, S., Kroh, M., Richter, D., Schröder, C., and Schupp, J. (2019). The German Socio-Economic Panel (SOEP). *Jahrbücher für Nationalökonomie und Statistik*, 239(2):345–360.
- Green, C. and Heywood, J. S. (2008). Does Performance Pay Increase Job Satisfaction? *Economica*, 75(300):710–728.
- Grund, C. and Sliwka, D. (2010). Evidence on Performance Pay and Risk Aversion. *Economics Letters*, 106(1):8–11.
- Halkos, G. and Bousinakis, D. (2010). The Effect of Stress and Satisfaction on Productivity. *International Journal of Productivity and Performance Management*, 59(5):415–431.
- Heywood, J. S. and Wei, X. (2006). Performance Pay and Job Satisfaction. *Journal of Industrial Relations*, 48(4):523–540.

- Isselhard, R., Manthei, K., and Vogelsang, T. (2022). The comparison of incentives and gifts—a field experiment. Technical report, Working Paper.
- Judge, T. A., Piccolo, R. F., Podsakoff, N. P., Shaw, J. C., and Rich, B. L. (2010). The Relationship Between Pay and Job Satisfaction: A Meta-analysis of the Literature. *Journal of Vocational Behavior*, 77(2):157–167.
- Kautonen, T., Hytti, U., Bögenhold, D., and Heinonen, J. (2012). Job Satisfaction and Retirement Age Intentions in Finland: Self-employed Versus Salary Earners. *International Journal of Manpower*, 33(4):424–440.
- Kube, S., Maréchal, M. A., and Puppe, C. (2012). The Currency of Reciprocity: Gift Exchange in the Workplace. *American Economic Review*, 102(4):1644–62.
- Kunz, A. H. and Pfaff, D. (2002). Agency Theory, Performance Evaluation, and the Hypothetical Construct of Intrinsic Motivation. *Accounting, Organizations and Society*, 27(3):275–295.
- Lawler III, E. E. (1992). The Ultimate Advantage: Creating the High-involvement Organization.
- Lazear, E. P. (2000). Performance Pay and Productivity. *American Economic Review*, 90(5):1346–1361.
- Long, R. J. (2000). Employee Profit Sharing: Consequences and Moderators. *Relations Industrielles*, 55(3):477–504.
- Neckermann, S. and Yang, X. (2017). Understanding the (Unexpected) Consequences of Unexpected Recognition. *Journal of Economic Behavior & Organization*, 135:131–142.
- Oswald, A. J., Proto, E., and Sgroi, D. (2015). Happiness and Productivity. *Journal of Labor Economics*, 33(4):789–822.
- Paylab (2017). Are Christmas and Year-end Bonuses a Given in Europe? <https://www.paylab.com/newsroom/are-christmas-and-year-end-bonuses-a-given-in-europe/50339?lang=en>. [Online; accessed 30.01.2023].
- Perugini, M., Gallucci, M., Presaghi, F., and Ercolani, A. P. (2003). The Personal Norm of Reciprocity. *European Journal of Personality*, 17(4):251–283.
- Pouliakas, K. (2010). Pay Enough, Don't Pay Too Much or Don't Pay at All? The Impact of Bonus Intensity on Job Satisfaction. *Kyklos*, 63(4):597–626.

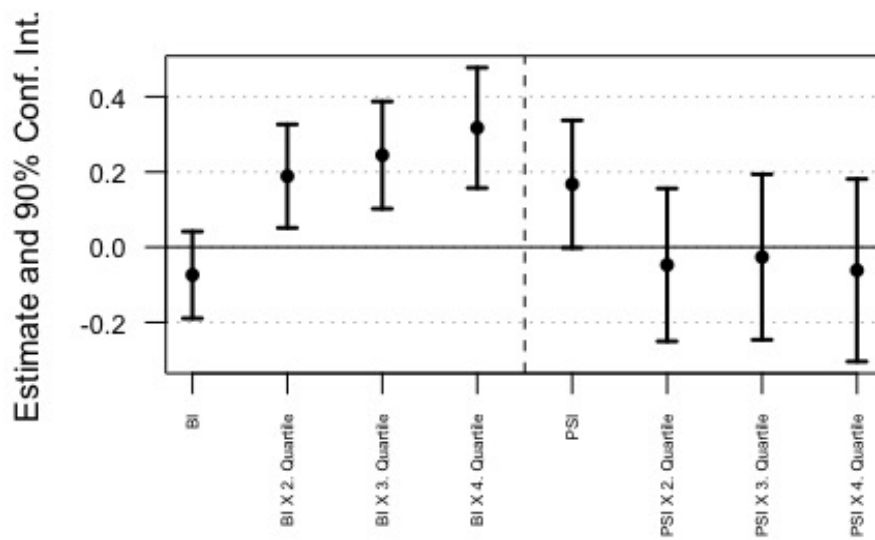
- Pouliakas, K. and Theodossiou, I. (2009). Confronting Objections to Performance Pay: The Impact of Individual and Gain-sharing Incentives on Job Satisfaction. *Scottish Journal of Political Economy*, 56(5):662–684.
- Scott, K. D. and Taylor, G. S. (1985). An Examination of Conflicting Findings on the Relationship Between Job Satisfaction and Absenteeism: A Meta-analysis. *Academy of Management Journal*, 28(3):599–612.
- Sockin, J. and Sockin, M. (2019). A Pay Scale of Their Own: Gender Differences in Variable Pay. *Available at SSRN 3512598*.

A Appendix

Figure A1: Risk-Taking and Reciprocity (Distributional Differences)



(a) Risk Taking



(b) Reciprocity

Figure notes: The figures present the moderating role of risk-taking and reciprocity in the relationship between BI/PSI and job satisfaction. The sub-figures show the main and interaction coefficients, as well as their corresponding confidence intervals.

Table A1: Bonus/Profit-sharing Intensity and Job Satisfaction (Without Top-Coding)

	(1) OLS	(2) FE	(3) OLS	(4) FE
(Intercept)	-0.574*** (0.110)		-0.505*** (0.111)	
BI	0.028*** (0.004)	0.011*** (0.003)		
PSI	0.002*** (0.000)	0.002*** (0.000)		
BI ∈ (0, 0.44]			0.047*** (0.009)	0.035*** (0.008)
BI ∈ (0.44, 1.04]			0.080*** (0.009)	0.044*** (0.008)
BI ≥ 1.04			0.095*** (0.011)	0.048*** (0.010)
PSI ∈ (0, 0.19]			-0.003 (0.015)	0.014 (0.012)
PSI ∈ (0.19, 0.88]			0.031** (0.012)	0.021** (0.010)
PSI ≥ 0.88			0.074*** (0.020)	0.029* (0.017)
log(total income)	0.244*** (0.011)	0.253*** (0.013)	0.229*** (0.011)	0.243*** (0.013)
female	0.001 (0.011)		-0.002 (0.011)	
number of children	0.034*** (0.004)	0.018*** (0.005)	0.035*** (0.004)	0.018*** (0.005)
married	0.036*** (0.009)	-0.010 (0.011)	0.036*** (0.009)	-0.009 (0.011)
age	-0.023*** (0.003)	-0.007* (0.004)	-0.023*** (0.003)	-0.007* (0.004)
age ²	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)	0.000** (0.000)
years of education	-0.018*** (0.002)	-0.017** (0.008)	-0.017*** (0.002)	-0.016* (0.008)
contractual hours per week	-0.012*** (0.001)	-0.007*** (0.001)	-0.012*** (0.001)	-0.007*** (0.001)
overtime per week	-0.007*** (0.001)	-0.004*** (0.001)	-0.007*** (0.001)	-0.004*** (0.001)
part-time	-0.052*** (0.015)	-0.029** (0.014)	-0.054*** (0.015)	-0.030** (0.014)
company size 20-199	-0.089*** (0.010)	0.003 (0.011)	-0.091*** (0.010)	0.001 (0.011)
company size 200-1999	-0.103*** (0.012)	0.031** (0.013)	-0.108*** (0.012)	0.028** (0.013)
company size ≥ 2000	-0.095*** (0.012)	0.050*** (0.013)	-0.100*** (0.012)	0.047*** (0.013)
tenure	-0.016*** (0.001)	-0.042*** (0.001)	-0.016*** (0.001)	-0.042*** (0.001)
tenure ²	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)
public sector	0.078*** (0.011)	0.061*** (0.012)	0.075*** (0.011)	0.059*** (0.012)
Num.Obs.	235551	235551	235551	235551
R2 Adj.	0.028	0.398	0.029	0.398
R2 Within		0.031		0.031

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany. The sample covers the years from 1985 to 2020. Column 1 and 2 use the continuous measure and column 3 and 4 the categorical definition. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A2: Bonus/Profit-sharing Incidence and Job Satisfaction (Full Output)

	(1) OLS	(3) FE
(Intercept)	-0.552*** (0.111)	
Bonus (0/1)	0.070*** (0.008)	0.041*** (0.007)
PS (0/1)	0.028*** (0.010)	0.020** (0.008)
log(total income)	0.235*** (0.011)	0.248*** (0.013)
female	-0.002 (0.011)	
number of children	0.034*** (0.004)	0.017*** (0.005)
married	0.038*** (0.009)	-0.008 (0.011)
age	-0.023*** (0.003)	-0.007* (0.004)
age^2	0.000*** (0.000)	0.000** (0.000)
years of education	-0.017*** (0.002)	-0.017** (0.008)
contractual hours per week	-0.012*** (0.001)	-0.007*** (0.001)
overtime per week	-0.008*** (0.001)	-0.004*** (0.001)
part-time	-0.054*** (0.015)	-0.029** (0.014)
company size 20-199	-0.091*** (0.010)	0.001 (0.011)
company size 200-1999	-0.106*** (0.012)	0.028** (0.013)
company size \geq 2000	-0.096*** (0.012)	0.046*** (0.013)
tenure	-0.016*** (0.001)	-0.042*** (0.001)
$tenure^2$	0.000*** (0.000)	0.001*** (0.000)
public sector	0.074*** (0.011)	0.059*** (0.012)
Num.Obs.	234230	234230
R2 Adj.	0.028	0.398
R2 Within		0.031

Table notes: The table shows the relationship between bonus/profit-sharing incidence and job satisfaction in Germany. The sample covers the years from 1985 to 2020. Column 1 shows the estimates for specifications without individual FE. Column 2 includes individual FE. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Bonus/Profit-sharing Intensity and Job Satisfaction (Full Output)

	(1) OLS	(2) FE	(3) OLS	(4) FE
(Intercept)	-0.470*** (0.112)		-0.488*** (0.112)	
BI	0.034*** (0.004)	0.015*** (0.003)		
PSI	0.012*** (0.003)	0.007** (0.003)		
BI ∈ (0, 0.44]			0.049*** (0.009)	0.036*** (0.008)
BI ∈ (0.44, 1.04]			0.082*** (0.009)	0.045*** (0.008)
BI ≥ 1.04			0.098*** (0.011)	0.049*** (0.010)
PSI ∈ (0, 0.19]			-0.010 (0.015)	0.010 (0.012)
PSI ∈ (0.19, 0.88]			0.026** (0.013)	0.019* (0.010)
PSI ≥ 0.88			0.075*** (0.018)	0.044*** (0.015)
log(total income)	0.231*** (0.011)	0.252*** (0.013)	0.227*** (0.011)	0.246*** (0.013)
female	0.000 (0.011)		-0.002 (0.011)	
children	0.034*** (0.004)	0.017*** (0.005)	0.034*** (0.004)	0.017*** (0.005)
married	0.038*** (0.009)	-0.009 (0.011)	0.037*** (0.009)	-0.008 (0.011)
age	-0.023*** (0.003)	-0.007* (0.004)	-0.023*** (0.003)	-0.007* (0.004)
age ²	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)	0.000** (0.000)
years of education	-0.017*** (0.002)	-0.018** (0.008)	-0.017*** (0.002)	-0.017** (0.008)
contractual hours per week	-0.012*** (0.001)	-0.007*** (0.001)	-0.012*** (0.001)	-0.007*** (0.001)
overtime per week	-0.008*** (0.001)	-0.004*** (0.001)	-0.008*** (0.001)	-0.004*** (0.001)
part-time	-0.053*** (0.015)	-0.029** (0.014)	-0.054*** (0.015)	-0.030** (0.014)
company size 20-199	-0.089*** (0.010)	0.002 (0.011)	-0.091*** (0.010)	0.001 (0.011)
company size 200-1999	-0.104*** (0.012)	0.029** (0.013)	-0.107*** (0.012)	0.028** (0.013)
company size ≥ 2000	-0.097*** (0.012)	0.047*** (0.013)	-0.099*** (0.012)	0.046*** (0.013)
tenure	-0.016*** (0.001)	-0.042*** (0.001)	-0.016*** (0.001)	-0.042*** (0.001)
tenure ²	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)
public sector	0.080*** (0.011)	0.061*** (0.012)	0.075*** (0.011)	0.059*** (0.012)
Num.Obs.	234230	234230	234230	234230
R2 Adj.	0.029	0.398	0.029	0.398
R2 Within		0.031		0.031

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany. The sample covers the years from 1985 to 2020. Column 1 and 2 use the continuous measure and column 3 and 4 the categorical definition. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A4: Bonus/Profit-sharing Intensity and Job Satisfaction - Alternative Specifications (1)

	(1) OLS	(2) FE
Bonus (0/1)	0.045*** (0.009)	0.034*** (0.008)
BI	0.041*** (0.008)	0.013* (0.007)
Profit-sharing (0/1)	0.001 (0.012)	0.011 (0.010)
PSI	0.045*** (0.012)	0.018 (0.011)
Num.Obs.	234230	234230
R2 Adj.	0.029	0.398
R2 Within		0.031

Table notes: The table shows the relationship of Bonuses/Profit-sharing payments and job satisfaction in Germany. The sample covers the years from 1985 to 2020. Column 1 shows the estimates for specifications without individual FE. Column 2 includes individual FE. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A5: Bonus/Profit-sharing Intensity and Job Satisfaction - Alternative Specifications (2)

	13 th and 14 th salary excluded		Squared Intensity		Alternative Earnings	
	(1) OLS	(2) FE	(3) OLS	(4) FE	(5) OLS	(6) FE
BI (baseline definition)			0.048*** (0.005)	0.019*** (0.005)		
PSI (baseline definition)	0.010*** (0.003)	0.006** (0.003)	0.012*** (0.004)	0.011*** (0.004)		
BI (13 th and 14 th salary excluded)	0.017*** (0.003)	0.009*** (0.003)				
BI^2			-0.017*** (0.004)	-0.003 (0.004)		
PSI^2			0.000 (0.003)	-0.006 (0.004)		
BI (alt. earnings)					0.053*** (0.004)	0.033*** (0.004)
PSI (alt. earnings)					0.022*** (0.003)	0.015*** (0.003)
Num.Obs.	234230	234230	234230	234230	206549	206549
R2 Within		0.031		0.031		0.027

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany with alternative intensity specifications. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A6: Bonus/Profit-sharing Intensity and Job Satisfaction - Effect Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
BI	0.015*** (0.003)	0.012** (0.005)	0.003 (0.017)	0.024*** (0.005)	0.025*** (0.007)	0.023*** (0.004)	-0.015*** (0.004)
PSI	0.007** (0.003)	0.006 (0.004)	0.025** (0.011)	0.005 (0.003)	0.024*** (0.009)	0.006** (0.003)	0.000 (0.004)
Panel A: Individual Characteristics							
BI X risk taker		-0.004 (0.006)					
PSI X risk taker		0.002 (0.005)					
BI X reciprocity			0.050*** (0.018)				
PSI X reciprocity			-0.010 (0.014)				
BI X female				-0.019*** (0.007)			
PSI X female				0.006 (0.006)			
Panel B: Sector and Company Size							
BI X public sector					-0.030*** (0.007)		
PSI X public sector					0.010 (0.008)		
PSI X company size 20-199						-0.013 (0.010)	
PSI X company size 200-1999						-0.019** (0.010)	
PSI X company size \geq 2000						-0.024** (0.009)	
BI X company size 20-199						0.003 (0.008)	
BI X company size 200-1999						-0.015* (0.009)	
BI X company size \geq 2000						-0.022** (0.008)	
BI X long empl.							0.043*** (0.006)
PSI X long empl.							0.010** (0.004)
Num.Obs.	234230	122268	29859	234230	234230	234230	234230
R2 Within	0.031	0.032	0.039	0.031	0.031	0.031	0.022

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany. The sample covers the years from 1985 to 2020. The moderating role of individual characteristics are shown in Panel A. Panel B displays the moderating role of sector and company size. All specification account for individual fixed effects. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A7: Bonus/Profit-sharing Intensity and Job Satisfaction - Firm Switcher and Firm FE

	Continuous Measure			Categorical Measure		
	(1)	(2)	(3)	(4)	(5)	(6)
BI	0.016*** (0.003)	0.019*** (0.003)	0.010*** (0.003)			
PSI	0.007** (0.003)	0.008*** (0.003)	0.005** (0.003)			
Switcher (0/1)		0.108*** (0.009)	0.165*** (0.010)		0.111*** (0.009)	0.167*** (0.010)
BI ∈ (0, 0.44]				0.035*** (0.008)	0.040*** (0.008)	0.024*** (0.008)
BI ∈ (0.44, 1.04]				0.045*** (0.008)	0.055*** (0.008)	0.030*** (0.008)
BI ≥ 1.04				0.050*** (0.010)	0.060*** (0.010)	0.035*** (0.010)
PSI ∈ (0, 0.19]				0.010 (0.012)	0.013 (0.012)	0.006 (0.012)
PSI ∈ (0.19, 0.88]				0.019* (0.010)	0.023** (0.010)	0.013 (0.010)
PSI ≥ 0.88				0.045*** (0.015)	0.050*** (0.015)	0.040*** (0.015)
Ind. FE	X	X		X	X	
Worker-in-firm FE			X			X
Num.Obs.	232342	232342	232342	232342	232342	232342
R2 Within	0.031	0.032	0.036	0.031	0.032	0.036

Table notes: The table includes a control for recent firm switch and the role of worker-in-firm FE. The sample covers the years from 1985 to 2020. Column 1-3 use the continuous BI (PSI) measure and column 4-6 the categorical definition. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A8: IVFE Estimates - Robustness Tests

Panel A: Ensure valid cell means (n > 10)			
	First stage: B	First stage: PS	Second stage
Bonus Density	0.050*** (0.003)	0.000 (0.001)	
PS Density	-0.007*** (0.002)	0.020*** (0.002)	
Bonus			0.636*** (0.133)
PS			0.016 (0.242)
Num.Obs.	232002	232002	232002
Panel B: Average PSI as instrument			
	First stage: BI	First stage: PS	Second stage
Bonus Density	0.045*** (0.003)	0.012** (0.005)	
Avg. PSI	-0.004** (0.001)	0.059*** (0.009)	
Bonus			0.740*** (0.139)
PSI			-0.038 (0.067)
Num.Obs.	234158	234158	234158
Panel C: Include industry controls on the nace-level			
	First stage: BI	First stage: PS	Second stage
Bonus Density	0.039*** (0.004)	0.003 (0.002)	
PS Density	0.000 (0.002)	0.020*** (0.002)	
Bonus			0.835*** (0.211)
PS			-0.195 (0.291)
Num.Obs.	234158	234158	234158
Panel D: Include worker-in-firm FE			
	First stage: BI	First stage: PS	Second stage
Bonus Density	0.032*** (0.004)	0.003 (0.002)	
PS Density	-0.002 (0.002)	0.016*** (0.002)	
Bonus			0.385* (0.204)
PS			0.239 (0.314)
Num.Obs.	232266	232266	232266

Table notes: The table shows the effect of bonus/profit sharing intensity on job satisfaction using instruments based on aggregation. The sample covers the years from 1985 to 2020. The instrument is defined as the industry-year specific density of bonus and profit-sharing payments. Additional control variables are the same as in Table 2. Panels A–D adjust the instrument specification to address concerns about the instrument’s validity. The standard errors are clustered at the nace-year level in line with the instrument specification. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A9: Bonus/Profit-sharing Intensity and Job Satisfaction - Change in Number of Employees

	(1)	(2)	(3)	(4)
Panel A: Continuous Measure				
BI	0.059*** (0.011)	0.046*** (0.011)	0.044*** (0.011)	0.040*** (0.011)
PSI	0.028* (0.016)	0.017 (0.018)	0.018 (0.016)	0.007 (0.018)
#employees remained			-0.333*** (0.014)	-0.219*** (0.013)
#employees decreased			-0.036*** (0.011)	-0.043*** (0.011)
Ind. FE		X		X
Num. Obs.	68,724	68,724	68,724	68,724
R2 Within		0.028		0.037
Panel B: Categorical Measure				
BI ∈ (0, 0.44]	0.068*** (0.015)	0.051*** (0.015)	0.059*** (0.015)	0.045*** (0.015)
BI ∈ (0.44, 1.04]	0.105*** (0.014)	0.088*** (0.015)	0.087*** (0.014)	0.079*** (0.015)
BI ≥ 1.04	0.088*** (0.017)	0.082*** (0.018)	0.064*** (0.017)	0.071*** (0.018)
PSI ∈ (0, 0.19]	0.011 (0.025)	0.007 (0.023)	-0.003 (0.025)	-0.004 (0.023)
PSI ∈ (0.19, 0.88]	0.022 (0.020)	0.023 (0.020)	0.011 (0.019)	0.015 (0.020)
PSI ≥ 0.88	0.039 (0.032)	0.017 (0.033)	0.024 (0.032)	0.004 (0.033)
#employees remained			-0.333*** (0.014)	-0.218*** (0.013)
#employees decreased			-0.037*** (0.011)	-0.043*** (0.011)
Ind. FE		X		X
Num. Obs.	68,724	68,724	68,724	68,724
R2 Within		0.028		0.037

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany when controlling for changes in the number of employees in a workers' firm in previous year. Panel A shows continuous BI and PSI measures, while Panel B shows the coefficients for the categorical definition. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

Table A10: Bonus/Profit-sharing Intensity and Job Satisfaction - Other Compensation Components (OLS Estimates)

BI	0.057***	0.057***	0.055***	0.053***	0.052***
	(0.011)	(0.011)	(0.011)	(0.016)	(0.016)
PSI	0.057***	0.040***	0.039***	0.039*	0.032
	(0.014)	(0.014)	(0.014)	(0.023)	(0.023)
# fringe benefits		0.063***	0.062***		
		(0.008)	(0.008)		
# add. bonuses			0.022**		
			(0.010)		
Performance Pay					0.036**
					(0.018)
Num. Obs.	81,065	81,065	81,065	23,338	23,338
R2 Adj.	0.031	0.032	0.032	0.031	0.032
Panel B: Categorical Measure					
BI ∈ (0, 0.44]	0.063***	0.065***	0.064***	0.069***	0.069***
	(0.013)	(0.013)	(0.013)	(0.021)	(0.021)
BI ∈ (0.44, 1.04]	0.087***	0.089***	0.088***	0.105***	0.105***
	(0.012)	(0.012)	(0.012)	(0.019)	(0.019)
BI ≥ 1.04	0.070***	0.071***	0.069***	0.074***	0.074***
	(0.017)	(0.017)	(0.017)	(0.025)	(0.025)
PSI ∈ (0, 0.19]	0.017	0.011	0.008	-0.033	-0.041
	(0.021)	(0.021)	(0.021)	(0.035)	(0.035)
PSI ∈ (0.19, 0.88]	0.058***	0.046***	0.044**	0.021	0.011
	(0.017)	(0.017)	(0.017)	(0.026)	(0.027)
PSI ≥ 0.88	0.098***	0.068***	0.068***	0.082**	0.070*
	(0.026)	(0.026)	(0.026)	(0.041)	(0.042)
# fringe benefits		0.064***	0.063***		
		(0.008)	(0.008)		
# add. bonuses			0.019**		
			(0.010)		
Performance Pay					0.040**
					(0.018)
Num. Obs.	81,064	81,064	81,064	23,338	23,338
R2 Adj.	0.031	0.032	0.032	0.031	0.032

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany when adding control variables for other compensation components. Panel A shows continuous BI and PSI measures, while Panel B shows the coefficients for the categorical definition. Individual fixed effects are excluded. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Bonus/Profit-sharing Intensity and Job Satisfaction - Other Compensation Components (FE Estimates)

	(1)	(2)	(3)	(4)	(5)
Panel A: Continuous Measure					
BI	0.011 (0.011)	0.010 (0.011)	0.009 (0.011)	0.036 (0.026)	0.033 (0.026)
PSI	0.027* (0.014)	0.023 (0.014)	0.022 (0.014)	0.063* (0.035)	0.058 (0.035)
# fringe benefits		0.047*** (0.009)	0.046*** (0.009)		
# add. bonuses			0.032*** (0.009)		
Performance Pay					0.085*** (0.029)
Num. Obs.	81,065	81,065	81,065	23,338	23,338
R2 Within	0.033	0.034	0.034	0.037	0.038
Panel B: Categorical Measure					
BI ∈ (0, 0.44]	0.043*** (0.013)	0.043*** (0.013)	0.042*** (0.013)	0.038 (0.032)	0.035 (0.032)
BI ∈ (0.44, 1.04]	0.033** (0.013)	0.032** (0.013)	0.031** (0.013)	0.067** (0.031)	0.064** (0.031)
BI ≥ 1.04	0.028 (0.018)	0.027 (0.018)	0.026 (0.018)	0.056 (0.040)	0.053 (0.040)
PSI ∈ (0, 0.19]	0.020 (0.018)	0.018 (0.018)	0.016 (0.018)	-0.029 (0.047)	-0.039 (0.047)
PSI ∈ (0.19, 0.88]	0.023 (0.015)	0.019 (0.015)	0.017 (0.015)	0.080** (0.038)	0.070* (0.038)
PSI ≥ 0.88	0.039 (0.026)	0.033 (0.026)	0.031 (0.026)	0.105* (0.063)	0.097 (0.063)
# fringe benefits		0.047*** (0.009)	0.046*** (0.009)		
# add. bonuses			0.031*** (0.009)		
Performance Pay					0.084*** (0.029)
Num. Obs.	81,064	81,064	81,064	23,338	23,338
R2 Within	0.034	0.034	0.034	0.038	0.039

Table notes: The table shows the relationship between BI (PSI) and job satisfaction in Germany when adding control variables for other compensation components. Panel A shows continuous BI and PSI measures, while Panel B shows the coefficients for the categorical definition. All specification account for individual fixed effects. Additional control variables are the same as in Table 2. The standard errors are clustered at the individual level. * p < 0.1, ** p < 0.05, *** p < 0.01

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