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Who Wants Performance-Related Pay?

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Abstract

Using three-wave panel data of German establishments and their employees, this study investigates three characteristics of those who have performance-related pay (PRP): productivity, risk aversion, and inequity aversion. The results indicate that productivity is positively related to an employee having PRP and to the size of performance rewards. Productive employees self-select into PRP contracts, between and within firms. PRP is not found to be related to risk aversion or inequity aversion.

1 Introduction

There is a large body of literature on performance-related pay (PRP). Define PRP as any payment scheme in which an employee's compensation is (partly) directly based on their performance. Aside from the direct effect such pay schemes may have on individual effort, PRP potentially affects the composition of the workforce by attracting people for whom PRP is appealing. Intuitively, employees who expect to perform well are attracted to jobs which reward performance. Theoretical work, such as Lazear (1986), formulates this intuition in a well-defined framework. In fact, there are good reasons to believe that this sorting effect of PRP exists and is substantial. Lazear (2000) studied the productivity gains in a firm introducing piece-rate pay. The 44-percent increase in productivity can be attributed equally to workers being incentivised by piece-rates on the one hand and selection of more productive employees on the other.

Experimental work reinforces that the sorting effect of PRP is an important one (Dohmen & Falk, 2011; Leuven, Oosterbeek, Sonnemans, & Van der Klaauw, 2011; Fehrenbacher, Kaplan,

*This study uses the Linked Personnel Panel (LPP), waves 2012-2013, 2014-2015, and 2016-2017, DOI: 10.5164/IAB.LPP1617.de.en.v1. Data access was provided under project number fdz1725 via on-site use at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and subsequently remote data access. I am grateful to the representatives of the FDZ for providing me with access to the data, and for their assistance with several inquiries.

& Pedell, 2017; Eriksson & Villeval, 2008). The laboratory experiment conducted by Dohmen and Falk (2011) first elicits productivity. After that, subjects can choose between a fixed payment and a variable payment based on performance. The authors show that a large part of the difference in output between variable payment group and the fixed payment group is driven by sorting: more productive individuals sort into PRP. They also demonstrate the importance of what they call 'multidimensional sorting', the phenomenon that various characteristics, such as risk attitude, play a role when individuals self-select into PRP schemes.

It has been documented that agents sort into PRP based on productivity, risk aversion, and inequity aversion in the lab, where they have a clear choice with few other considerations (e.g., Dohmen & Falk, 2011; Teyssier, 2008). It remains to be seen whether these multidimensional features have the same explanatory power for employment decisions in a variety of organisations, where many other aspects of an employment contract could play a role. Although Dohmen and Falk (2011) attempt to show external validity of their results by using observational data, they do so very briefly. The purpose of the present study is to investigate who chooses PRP using representative survey data. The main focus is on what characterises employees who self-select into PRP contracts.

Empirical evidence on self-selection into PRP contracts is rather narrow. Literature to date uses experimental approaches or studies conducted within a single organisation. The present study seeks to achieve a more general interpretation by using a representative panel of the German working population. For lack of a perfect productivity variable, I try out different proxies to those used in Dohmen and Falk (2011). In addition, I study whether risk and inequity aversion matter for having a PRP contract. As far as I am aware, inequity aversion is only studied once in relation to PRP (Teyssier, 2008). In addition to between- and within-employee sorting, this study explores within-firm sorting. This could be important if it matters whether employees are more productive than their colleagues rather than the other participants in the labour market. Finally, a variety of important attributes, such as the Big Five personality traits, are utilised as control variables.

Practitioners will potentially benefit from knowing more about what drives individual decisions of employment contracts as it allows them to tailor contracts to employees' preferences. An employer who is considering implementing PRP may benefit from eliciting risk and inequity aversion in the recruitment process, or screening on those. A possible result is better matching between employer and employee, which increases efficiency.

The results indicate that productivity is positively related to having PRP and larger performance rewards. They could be interpreted as between- or within-employee sorting, but there is no evidence for within-employee sorting separately. On the contrary, sorting does emerge from analysis at the firm level. In other words, the results are in line with the notion that productive employees self-select into PRP contracts. This sorting seems to occur between and within or-

ganisations. These findings, however, could also result from reverse causality. The data shows no systematic relation between PRP and risk aversion or inequity aversion.

2 Theoretical Framework

2.1 Productivity

Productivity sorting has been well-established in experimental work, but evidence from a broad range of organisations is scarce. Guiteras and Jack (2018) ran a field experiment in rural Malawi and found no productivity sorting in addition to the incentive effect. However, a variety of other studies support sorting. Leuven et al. (2011) conducted an experiment in which they let students in an economics course choose between tournaments with different reward sizes (€1,000, €3,000 and €5,000) at the start of the course. After students had chosen one of the three tournaments, they were randomly assigned to the treatment or control group. Each of the three monetary amounts was won by the student in the treatment group who performed best on the exam. Students in the control group did not participate in the tournament. This design allowed the authors to obtain the incentive effect by comparing each treatment group to the appropriate control group, and sorting by comparing the three reward size groups. The results indicate that the prize has no incentive effect; rather, all heterogeneity between the groups in terms of productivity (performance on the exam) can be attributed to self-selection.

A laboratory experiment by Fehrenbacher et al. (2017) shows that the number of experimental tasks solved within a given time frame is positively associated with choosing PRP and the strength of the performance incentives. Another laboratory experiment provides evidence for productivity sorting without letting subjects exert any real effort (Eriksson & Villeval, 2008). Finally, Dohmen and Falk (2011) conduct an experiment similar to Fehrenbacher et al. (2017), finding strong evidence for productivity sorting. Based on these studies, I hypothesise that individual productivity is positively related to both having a PRP contract and the strength of the incentives.

Dohmen and Falk (2011) provide experimental evidence from the lab in their insightful experimental paper. As a bonus they include external evidence from the German Socio-Economic Panel Study (SOEP). This is a positive step towards testing sorting into PRP in the field. However, it remains to be seen whether the external confirmation of their experimental evidence is a result of limited measurement. Specifically, the authors are unable to measure PRP and productivity. They use a proxy that records whether an employee has regular performance evaluations as the dependent variable. Although it is not hard to imagine that performance evaluations are correlated to PRP, they measure a different concept. Not all principals who choose to conduct performance evaluations also base pay on performance. In the data I use, 3,257 out of 10,674

individuals (31%) who report having an appraisal interview report having no PRP, and 4,812 out of 10,297 (47%) who report not having an appraisal interview do report having PRP.[1]

Years of schooling, experience and tenure are used as independent variables to proxy productivity. Years of schooling shows a positive coefficient (Dohmen & Falk, 2011). One explanation is that this is a good proxy for productivity. Another is that it reflects job type. Jobs that require higher education are arguably more likely to have performance evaluation because those jobs are more complex. Performance is typically more difficult to measure in such cases, meaning that PRP may be less prevalent. On the contrary, simple jobs where performance is easily observed are probably more likely to have PRP. A famous example is the company that installs windshields, studied by Lazear (2000). He also provides some statistics from the National Longitudinal Survey of Youth, indicating that piece-rate pay is used more in simple jobs than complex ones, where performance is usually difficult to measure.[2] Considering this, it is not surprising that the coefficient of years of schooling turns to zero when firm size, industry and occupation dummies are added to the model in Dohmen and Falk (2011). A reasonable explanation is that these dummies capture the aforementioned differences in the prevalence of PRP among industries and jobs.

Performance evaluations increase in experience, which is consistent with productivity sorting. Alternatively, the positive coefficient could be explained by more experienced employees being more likely to end up doing complex work. Tenure has a small positive coefficient, but it turns negative when the aforementioned dummies are added to the regression. Risk tolerance is positively related to performance evaluations, corroborating the experimental evidence if performance evaluations proxy PRP well. In sum, these results from the SOEP somewhat confirm the experimental evidence, but other interpretations are possible. More evidence from the field is needed. I attempt to take a step into that direction by using three-wave panel data with five direct measures of PRP and two different proxies for productivity.

2.2 Risk Aversion

Many experimental studies conclude that those who choose PRP are less risk averse (e.g., Dohmen & Falk, 2011; Fehrenbacher et al., 2017; Bradler, 2015), and one study supports this with evidence from a representative sample (Grund & Sliwka, 2010). Bonin, Dohmen, Falk, Huffman, and Sunde (2007) find that risk averse individuals are more likely to have jobs with low earnings risk. Individuals with a PRP contract have higher earnings risk than those with a fixed wage as long as the variance in their output or its performance measure is non-zero. All this leads to the hypothesis that risk averse individuals are less likely to be employed under

[1] These are person-year observations in a biannual panel. Please refer to Section 3 for a description of this data.

[2] Dating back to 1990 and before, these statistics may no longer be representative. In addition, note that piece-rate pay is a more narrowly defined concept than PRP.

a PRP contract. In addition, any incentives they might have are weaker. In other words, risk aversion is negatively related to PRP on the extensive as well as the intensive margin.

2.3 Inequity Aversion

There is plenty of experimental and empirical research showing that individuals do not like inequity in earnings between their colleagues and them, but evidence on sorting into PRP based on inequity aversion is limited. Fehr and Schmidt (1999) offered inequity aversion as an explanation for the abundant experimental evidence that already existed at that time. Studying inequity aversion in the field, Card, Mas, Moretti, and Saez (2012) randomly inform some employees of the University of California about a website on which they can find out how much their colleagues earn. Their results show that knowing about pay inequality leads to lower pay and job satisfaction. So it seems that, in general, employees do not like inequality in pay between them and their coworkers. Since basing pay on performance leads to more inequality in earnings, individuals might try to avoid firms that offer PRP if their inequity aversion is sufficiently strong. In addition, employees that do have PRP might seek weaker incentives. In fact, this is what has been found in the only experiment that directly inquires into the effect of inequity aversion on the choice of a PRP contract (Teyssier, 2008). When subjects were offered a choice between two PRP contracts, inequity aversion led them to choose the least competitive one more often. Hence, the third hypothesis states that inequity averse individuals are less likely to have PRP, on both the extensive and intensive margin.

3 Data & Measurement

This study uses the Linked Personnel Panel (LPP), a representative panel of linked employer-employee data. The survey behind the panel contains a wide range of questions about firm practices and individual characteristics and attitudes. The first wave consists of 1,219 German establishments and 7,508 employees working for those establishments. The second wave contains 771 establishments and 7,282 employees, while those numbers are 846 and 6,779 for the third.[3] An establishment needs to have at least 50 employees, be in the private sector and be subject to social security to be in the sample. The survey takes place every two years. This study uses the individual employee as the unit of observation. Since not all individuals answer all survey questions, the sample size varies depending on the variables being used. Controls are employed when their use does not result in too many lost observations.

[3] If someone is not employed by the same establishment in a subsequent wave, a short survey is conducted to inquire about the reasons for leaving the previous employer. Observations resulting from these short surveys are dropped from the sample.

The data source that Dohmen and Falk (2011) use does not contain measures on PRP, so they are forced to use performance evaluations. A clear advantage of the LPP is that information on PRP is elicited from employees by multiple survey questions. There are five dependent variables. The first is a binary indicator for whether the employee received any performance-related bonuses or extra payments in addition to their basic salary or wage. This includes bonuses, one-time payments, profit-sharing bonuses, premiums, gratifications, among others. This first variable allows for testing the extensive margin of PRP. All the following variables are only available for those who receive any kind of PRP, so they are used to analyse PRP at the intensive margin. The second measure indicates whether these payments are (partly) based on a contractual commitment or not.[4] PRP is also reported as the contractually agreed amount as a percentage of total basic salary and as the actual euro amount paid out to the individual. Finally, the amount of PRP paid out without contractual commitment is reported if the employee has stated that they receive non-contractual payments.[5] All non-binary dependent variables are winsorised at 5% in the upper tail to reduce the influence of extremely large values and to obtain more precise estimates. Ideally, one would inspect individual observations with extreme values, but that is not allowed due to privacy restrictions.

Individual productivity is proxied by two variables in the LPP, which are not available in the first wave. First, there is an indicator of whether somebody is employed outside the agreed scale rate. The survey question is phrased as follows. "Are you employed outside the agreed scale rate? This means that your pay is not covered by collective agreement, but is agreed with the employer subject to an individual contract, because you are above the highest pay grade in the collective agreement." Someone's pay being higher than the one collectively agreed upon could be an indication that their productivity is unusually high, although their employer could also be paying higher wages to every employee. Subjects for whom there was no collective agreement were assigned a missing value. The second productivity measure is constructed using three survey questions on self-efficacy. Subjects indicated to what extent the following statements apply on a 5-point scale: 'I can rely on my own abilities in difficult situations', 'I am able to solve most problems on my own' and 'I can usually solve even challenging and complex tasks well'. Self-efficacy is only elicited when an individual enters the panel, presumably because it is not expected to change much in the short run. As a result, there is no time variation in these variables. Neither of the proxies is a perfect way to measure productivity, so trying out both and comparing the results is the best way to proceed. 26 percent of the full sample is employed outside the agreed scale rate. Self-efficacy does not show much variation, with most subjects

[4]Contractual PRP reflects stronger incentives than non-contractual PRP in my view, but others might disagree.

[5]PRP paid out and non-contractual payments are both 2011 values in the first wave. In the second wave, PRP paid out refers to 2013 and non-contractual payments to 2014. These years are 2015 and 2016, respectively, in the third wave. The year of non-contractual payments was changed after the first wave because those payments are typically paid in the next year.

assigning themselves to the highest or second highest category.

Risk aversion is a self-reported measure on an 11-point scale ranging from 'risk averse' to 'fully prepared to take risks'. This question is formulated the same as in wave 2004 of the SOEP, used by Dohmen and Falk (2011). The resulting variable appears to be a good predictor of decisions under risk with real incentives (Dohmen et al., 2011). Inequity aversion is measured on a 5-point scale by asking to what extent individuals agree with the statements 'It makes me angry when others are undeservingly better off than me' and 'I feel guilty when I am better off than others for no reason'. The sum of both responses is taken in order to capture inequity aversion in one variable. Like self-efficacy, the risk and inequity aversion variables do not vary over time. I have reversed the order of both variables so that higher values represent stronger aversion to risk or inequity. I further treat both variables as continuous.

I use various control variables, among which are the Big Five personality traits that Bradler (2015) also controls for. Using these as controls is valuable because they may play a large role in explaining someone's choice of contract and be correlated to self-efficacy. The other control variables report on gender, age, working from home, training, appraisal interviews, personnel development, reliance, trust, time preference, reciprocity, altruism, health, sick days, and education. A detailed list of these variables is available on request.

Variables for self-efficacy, risk aversion, inequity aversion, trust, personality, time preference, reciprocity, altruism, education, and training were extrapolated to subsequent time observations because they were only recorded when an individual first appeared in the panel. Time preference, reciprocity, and altruism were introduced in the second wave of the LPP. In addition to forward extrapolation, these variables are also extrapolated backwards to the first wave. This does not seem harmful as these attitudes are unlikely to change in the short run.

Ten different samples are used for the main results because the missing values vary across variables used, both dependent and independent. The main results are split between productivity on the one hand, and risk and inequity aversion on the other. Since productivity is unavailable for this first wave, this division helps to retain observations. Besides, it leaves the results unaffected, as will be shown in Section 6. Table 1 displays summary statistics for the largest samples, split between productivity, and risk and inequity aversion. 60 percent indicate that they have PRP. Self-efficacy has a low standard deviation, but risk and inequity aversion show considerable variation between individuals. Complete summary statistics for all samples and control variables are available on request.

Since the full sample is not used for the analyses, sample selection bias may be present. Between-effects (BE) regression is used to evaluate sample selection because it does not capture any attrition effects. The outcomes are the five PRP variables discussed above. The independent variable is an indicator that equals 1 if an observation is selected for the analysis, and 0 otherwise. Being selected amounts to having non-missing values in the dependent variable,

Table 1: Summary statistics

Productivity	Obs.	Mean	Std. Dev.	Min.	Max.
PRP Indicator	11,284	0.596	-	0	1
PRP is contractual	6,663	0.771	-	0	1
PRP percentage of basic salary	4,097	28.988	34.510	1	250
PRP percentage of basic salary (winsorised)	4,097	27.449	29.107	1	100
PRP paid out	3,878	7,308.036	21181.524	0	500,000
PRP paid out (winsorised)	3,878	5,519.975	7,671.079	0	30,000
PRP paid out without contract	2,374	2,505.180	8,092.079	0	250,000
PRP paid out without contract (winsorised)	2,374	1,817.170	2,089.424	0	8,000
Employed outside agreed scale rate	11,284	0.262	-	0	1
Self-efficacy	11,284	12.714	1.417	3	15
Risk & Inequity Aversion					
PRP Indicator	14,565	0.597	-	0	1
PRP is contractual	8,610	0.765	-	0	1
PRP percentage of basic salary	5,239	29.386	35.021	1	250
PRP percentage of basic salary (winsorised)	5,239	27.744	29.341	1	100
PRP paid out	4,977	7,071.537	19624.058	0	500,000
PRP paid out (winsorised)	4,977	5,424.943	7,639.155	0	30,000
PRP paid out without contract	3,069	2,436.153	7,577.088	0	250,000
PRP paid out without contract (winsorised)	3,069	1,786.646	2,074.726	0	8,000
Risk aversion	14,565	4.347	1.813	0	10
Inequity aversion	14,565	4.969	2.026	2	10

Notes: Summary statistics. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Non-binary dependent variables have been winsorised at 5% in the upper tail.

the two proxies for productivity, and the selected controls.

The upper part of Table 2 shows the results for the productivity samples, which point to sample selection bias. Being selected is associated with being 3.9 percentage points more likely to have PRP and a 2.8 percentage points increase in the probability that PRP is contractual. These are increases of 6.7 and 3.7 percent from their respective means. Both are significant at 1 percent and are considered large coefficients. Although the point estimate for the percentage is negative and insignificant at 10 percent, the monetary amounts of PRP are significantly larger when somebody is selected. The increases of €685 (0.09 standard deviations) and €257 (0.13 standard deviations) are considered large.

Table 2: Sample Selection

	1 if PRP	1 if contractual	Percentage	Paid out	Non-contractual
	(1)	(2)	(3)	(4)	(5)
1 if selected	0.039***	0.028***	-1.2	685***	257***
(productivity)	(0.009)	(0.010)	(0.8)	(217)	(73)
Constant	0.558***	0.741***	28.3***	4,548***	1,526***
	(0.006)	(0.007)	(0.6)	(156)	(53)
Model	BE	BE	BE	BE	BE
R-squared	0.001	0.001	0.000	0.002	0.003
Observations	20,997	12,056	7,088	6,693	4,156
1 if selected (risk &	0.037***	0.011	-0.6	599***	245***
inequity aversion)	(0.008)	(0.009)	(0.8)	(218)	(75)
Constant	0.555***	0.748***	28.0***	4,515***	1,498***
	(0.006)	(0.007)	(0.7)	(180)	(62)
Model	BE	BE	BE	BE	BE
R-squared	0.002	0.000	0.000	0.002	0.003
Observations	20,997	12,056	7,088	6,693	4,156

Notes: Between-effects regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The lower part of Table 2 shows results for the risk and inequity aversion samples. The analysis has the same setup, but now risk and inequity aversion should be non-missing instead of the two productivity proxies. Sample selection bias is generally weaker here, but it remains an issue. The size of the coefficient of the PRP dummy is almost the same size as above and significant at 1 percent. There is no support for sample selection bias in the two subsequent samples. Although they are smaller than above, the monetary coefficients of €599 and €245 are significant at 1 percent. In conclusion, this study seems to suffer from sample selection bias, which leads to point estimates that are too high.

Since panel data is used, attrition is a possible concern. The estimations will be biased if attrition is related to PRP. Three independent variables are used. First, an indicator for whether someone is observed in all three waves. The second indicator is for whether an employee is observed in the next wave. The final variable measures the number of waves somebody is present in the panel. Tables A1 up to A5 report regression results on attrition. For the sake of brevity, I will only discuss coefficients that are significant at 5 or 1 percent.

According to Table A1, employees are 1.3 to 1.6 percentage points more likely to have PRP for each wave in which they appear, and 2.9 percentage points more likely if they are present in all waves. So, having PRP is more likely for those who stay in the sample. Table A2 shows that those present in all waves are 3.1 to 4 percentage points less likely to have contractual PRP. The number of waves present is also negatively related to contractual PRP, with a size of 1.6 percentage points. These results suggest that staying in the sample is negatively related to contractual PRP. If somebody is present in the next wave, their percentage of PRP is 2.6 percentage points lower (Table A3). Finally, each wave employees are present adds on average €110 to €137 to their non-contractual PRP (Table A5). All in all, these estimates indicate that attrition bias is two-directional and modest in size.

4 Empirical Strategy

The hypotheses are tested using random effects (RE) regression because none of the variables of interest vary over time, with the exception of being employed outside the scale rate.[6] Productivity is available for fewer observations than risk and inequity aversion. Therefore, the productivity hypothesis is tested separately from the other two to avoid disregarding too many observations while testing the risk and inequity aversion hypotheses. In Section 6 it will be shown that testing all hypotheses in the same model does not change the results. The following equation is used to test the first hypothesis.

$$\begin{aligned} PRP_{it} = \alpha_i + \gamma_t + \beta_1 \textit{employed outside scale rate}_{it} + \beta_2 \textit{self-efficacy}_i \\ + \boldsymbol{\delta X_{it}} + \boldsymbol{\eta Z_i} + \varepsilon_{it} \end{aligned} \tag{1}$$

Here PRP_{it} is one of the five outcome measures for individual i at time t, α_i denotes RE, γ_t denotes time fixed effects (FE), $\boldsymbol{X_{it}}$ and $\boldsymbol{Z_i}$ are vectors of time-varying and time-invariant control variables, respectively, and ε_{it} is the idiosyncratic error. Similarly, the equation for risk

[6]The random effects models are estimated using generalised least squares (GLS). Since weighting is not possible with GLS, the weighted regression results in Tables A12 and A13 are obtained by maximum likelihood estimation (MLE).

and inequity aversion is

$$PRP_{it} = \alpha_i + \gamma_t + \beta_1 \textit{risk aversion}_i + \beta_2 \textit{inequity aversion}_i + \boldsymbol{\delta X_{it}} + \boldsymbol{\eta Z_i} + \varepsilon_{it}. \quad (2)$$

These RE specifications require that none of the independent variables are correlated to the individual-specific heterogeneity α_i. This assumption is probably violated. Nevertheless, RE remains the most appropriate model since I am interested in the parameters of time-invariant covariates, and the idiosyncratic errors ε_{it} are most likely serially correlated over time. Additionally, I include a variety of potentially relevant control variables, which makes the assumption more plausible than usual.

Standard errors are clustered at the individual level because observations of the same individual are most likely not independent. Clustering at the firm level would be more appropriate because observations are also not independent within firms. However, employees who move between firms need to be dropped to implement clustering by firm. Hence, I will cluster by employee in the main analysis and by firm in Section 6.

Equations 1 and 2 are suitable to study sorting across the entire sample of individuals, between and within firms. However, they are inappropriate if sorting only occurs within firms and not between. Simply put, perhaps employees merely need to be more willing to take risks than their colleagues to have PRP, regardless of their overall risk aversion. To cope with this, I apply within-firm standardisation to all non-binary dependent and independent variables by subtracting the within-firm mean and dividing by the within-firm standard deviation. Where the dependent variable is binary, I include firm FE as a substitute for standardisation of the outcome. RE estimation is not used in those cases, but rather linear regression where the firm dummies are not explicitly estimated. Consequently, within-person serial correlation is not properly accounted for.

5 Results

5.1 Productivity

Table 3 shows regression results for the first hypothesis, which states that productivity is positively related to PRP. All models include year FE and are shown with and without control variables for each dependent variable. Two productivity proxies are included: whether someone is employed outside the agreed scale rate and self-efficacy. As these are RE models, the first coefficient should be interpreted as both between- and within-employee sorting. The second coefficient captures only between-employee sorting because self-efficacy has no time variation.

Self-efficacy shows no clear relation with PRP since most of its coefficients are close to zero, signs vary, and standard errors are large. This could be expected based on the small

standard deviation in self-efficacy. On the contrary, the other independent variable does seem to be related to PRP. Column 2 indicates that if somebody is employed outside the agreed scale rate, they are on average 4.4 percent more likely to have PRP, ceteris paribus. This is significant at 1 percent, and quite large considering that it is a 7.4 percent increase from the mean of the PRP indicator (Table 1). Column 4 shows that it is 2.5 percent more likely that PRP is contractual when an employee is employed outside the agreed scale rate, but this is only significant at 10 percent. The coefficient in Column 6 with PRP as percentage of the total basic salary as dependent variable is close to zero with a large standard error. Hence, not much can be said about the PRP percentage.

More interesting are the final four models, where the outcomes are the monetary amounts of PRP. All coefficients have relatively small standard errors and are therefore significant at 1 percent. Their magnitude is €3,442 (0.45 standard deviations) PRP paid out and €797 (0.38 standard deviations) non-contractual PRP. In sum, Models 2, 8, and 10 show large partial associations, which suggests that productivity and PRP are related at the intensive as well as the extensive margin. Nevertheless, Table 3 does not necessarily provide strong evidence for productivity sorting. Simultaneous causality is likely to cause upward bias in these coefficients for two reasons. First, the more PRP employees are paid, the more likely it is that their earnings become higher than specified in the collective agreement. Second, the incentive effect of PRP makes employees more productive.

Up to now I have considered results for between- and within-employee productivity sorting simultaneously. Two more types of sorting deserve some attention. First, Table A6 shows results for productivity using only the first proxy with employee FE to explore within-employee sorting separately. In this case, going from RE to individual FE results in smaller and less precise point estimates. While between-employee productivity sorting may be concluded based on Table 3, within-employee sorting cannot be demonstrated. This could be simply due to the fact that being employed outside the scale rate has little time variation, as reflected in its small within-employee standard deviation (untabulated).

Second, if there is no within-employee sorting, there might still be within-firm sorting. Table A7 displays results for standardised productivity. That is, self-efficacy and the three continuous dependent variables have been standardised at the firm level as they are non-binary. The first four models that have binary outcomes include firm FE as a substitute for standardisation. Self-efficacy has small and insignificant coefficients again. Being employed outside the agreed scale rate, however, shows significant association with PRP in all model specifications with control variables. According to Column 2, it is associated with an 8.5 percentage points increase in the probability to have PRP, almost double the size of the estimation in Table 3. There is a 3.7 percentage points increase in the probability that PRP is contractual. This association was small, negative and significant at 10 percent in Table 3. The following parameters

Table 3: Productivity

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed outside agreed scale rate	0.087***	0.044***	0.011	-0.025*	-1.8*	0.2	5,548***	3,442***	1,138***	797***
	(0.011)	(0.011)	(0.011)	(0.013)	(1.0)	(1.1)	(320)	(316)	(113)	(106)
Self-efficacy	-0.000	0.002	0.001	-0.004	0.5	-0.1	76	148	-29	-3
	(0.004)	(0.004)	(0.004)	(0.005)	(0.4)	(0.4)	(88)	(103)	(33)	(37)
Constant	0.567***	0.412***	0.762***	1.004***	20.7***	51.6**	2,748**	-1654	1,888***	-247
	(0.047)	(0.145)	(0.052)	(0.181)	(4.6)	(20.3)	(1,125)	(2,406)	(418)	(893)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.010	0.108	0.001	0.042	0.003	0.055	0.152	0.264	0.076	0.234
Observations	11,284	11,284	6,663	6,663	4,097	4,097	3,878	3,878	2,374	2,374

Notes: Regression results. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

should be interpreted in terms of standard deviation changes in the outcome. Being employed outside the agreed scale rate is associated with a 0.14 standard deviations increase in the percentage of PRP. These associations are 0.34 and 0.31 standard deviations in PRP paid out and non-contractual PRP, respectively (Models 8 and 10). These last two point estimates are a little lower than in Table 3 (where they were 0.45 and 0.38 standard deviations, respectively). As a caveat, note that I am comparing overall to within-firm standard deviations here. To conclude, it appears that within-firm sorting at the extensive margin is stronger than within- and between-employee sorting. At the same time, within-firm sorting at the intensive margin is notable but weaker than within- and between-employee sorting.

5.2 Risk Aversion

Table 4 shows results pertaining to the second hypothesis, which proposed a negative relation between risk aversion and PRP. Inequity aversion is also included and will be discussed below. Results with risk and inequity aversion in separate models are very similar (untabulated). Model 1 shows a negative coefficient that is significant at 1 percent. An increase of 1 point on the risk aversion scale is associated with a 1.1 percentage points decrease in the probability to have PRP, on average. This association seems to disappear, however, when adding control variables in Model 2. The same can be observed for whether PRP is contractual (Models 3 and 4). The PRP percentage of basic salary is estimated to decrease by a mere 0.32 percentage points. This is not significant at 10 percent (Model 6). Model 7 displays a coefficient of -€347 that is significant at 1 percent, but it increases to -€188 when including controls. A 1 point (1 standard deviation increase) in risk aversion is on average associated with a €337 (0.04 standard deviations) decrease in PRP paid out, which is not particularly large. The final two models of Table 4 show that the already weak negative coefficient of €40 turns to a positive though imprecise one of €5 with control variables. In conclusion, Model 2 shows no evidence that there is sorting into PRP based on risk aversion on the extensive margin. There is not much support for sorting on the intensive margin either, with the strongest association being the modest one of Model 8. Taken together, these results do not point to any strong relationship between risk aversion and PRP, neither on the extensive nor the intensive margin.

Nevertheless, there could still be sorting within organisations. To this end, Table A8 shows standardised results for risk aversion. As in Table A7, firm FE are included where the dependent variable is binary. In the first four columns, the coefficients should be interpreted as the change in probability when risk aversion increases by 1 standard deviation. In Column 5 up to 10, they indicate by how many standard deviations the dependent variable changes if risk aversion changes by 1 standard deviation. For any model, the estimated magnitude of the association is small and indistinguishable from zero when control variables are accounted for.

Table 4: Risk & Inequity Aversion

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Risk aversion	-0.011***	-0.003	-0.007**	-0.002	-0.3	-0.3	-347***	-188***	-40*	5
	(0.003)	(0.003)	(0.003)	(0.003)	(0.3)	(0.3)	(67)	(65)	(23)	(23)
Inequity aversion	-0.007***	-0.001	-0.004*	-0.001	-0.1	0.2	-236***	-133**	-41**	-14
	(0.002)	(0.002)	(0.003)	(0.003)	(0.2)	(0.3)	(59)	(56)	(19)	(20)
Constant	0.695***	0.600***	0.815***	0.976***	29.6***	46.5**	7,584***	2,063	2,040***	446
	(0.018)	(0.122)	(0.020)	(0.154)	(1.8)	(18.6)	(477)	(1,929)	(159)	(698)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.003	0.103	0.002	0.040	0.001	0.049	0.013	0.215	0.003	0.194
Observations	14,565	14,565	8,610	8,610	5,239	5,239	4,977	4,977	3,069	3,069

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.3 Inequity Aversion

Results for the final hypothesis, a negative relation between inequity aversion and PRP, are also presented in Table 4. Model 1 shows that an increase of 1 point (standard deviation) in inequity aversion is associated with a 0.7 percentage points decrease in the probability to have PRP, on average. This is significant at 1 percent. However, the coefficient shifts to only -0.1 percentage points with the inclusion of control variables. Point estimates for whether PRP is contractual are small and insignificant (Models 3 and 4). Model 6 shows a small, insignificant, positive coefficient of 0.2 percentage points. The relationship between inequity aversion and PRP paid out is negative and significant, with a size of €133 conditional on the control variables. This is not considered large, for it is only 0.02 of a standard deviation in PRP paid out. Finally, Models 9 and 10 show small coefficients with relatively small standard errors. In sum, Model 2 shows no support for a negative relation between inequity aversion and PRP on the extensive margin. If there is any evidence for this relation on the intensive margin, it can be found in Column 8, where the dependent variable is PRP paid out. However, the coefficient of -€133 is rather small.

Two modifications to the inequity aversion model should be considered. First, recall from Section 3 that the inequity aversion variable was constructed from positive and negative inequity aversion. These could be related to PRP differently. However, this does not seem to be the case based on models that include these two types of inequity aversion separately (untabulated). Second, standardised results for inequity aversion are shown in Table A8 to consider within-firm sorting. The coefficients for inequity aversion displayed here should be interpreted as standard deviation changes, except in Models 1 up to 4. None of the estimated associations are significantly different from zero at 5 percent where controls are included. In addition, the point estimates are tiny and have small standard errors. In conclusion, evidence for sorting into PRP by inequity aversion is lacking in this study, whether the analysis is between- and within-employee or within-firm.

6 Robustness Checks

Several variations in estimating the main results found in Tables 3 and 4 are applied to inquire into the robustness of the findings. First, they remain qualitatively the same if productivity, risk aversion, and inequity aversion are all included in the same regression (Table A9.) Second, standard errors are clustered at the firm level for reasons discussed in Section 4. Tables A10 and A11 show that standard errors only change slightly. They become higher in most cases, which could also result from smaller sample sizes. Third, weighted regressions, where the weights are computed as the inverse of the number of times an employee appears in the panel, show similar

results (Tables A12 and A13).

Fourth, unwinsorised results are displayed in Tables A14 and A15. For productivity, the point estimates generally increase in magnitude and retain their sign. The same applies to risk and inequity aversion, except that most point estimates shift towards zero. The difference is understandable because there are only positive extreme values to winsorise, and most signs for the risk and inequity aversion coefficients are negative. Fifth, some might suggest adding individual wage or salary as control variable because it may be related to both PRP and the independent variables of interest. However, I assert that it is a bad control in the sense that it is largely determined after productivity, risk aversion, and inequity aversion. Nevertheless, Tables A16 and A17 show results where self-reported values of gross and net pay (both winsorised at 5% in the upper tail) are included along with the other controls. The number of observations is lower because gross and net pay are available for fewer respondents. While some coefficients change notably compared to the main results, the general conclusions remain unaffected by controlling for pay.

7 Discussion

This study inquires into the characteristics of those who are employed under performance-related pay (PRP) contracts. Specifically, PRP is hypothesised to be positively related to productivity, and negatively related to risk aversion and inequity aversion. These relations are expected at the extensive as well as the intensive margin. Productivity sorting at both margins is supported by the data. The results could be interpreted as between- or within-employee sorting, but there is no evidence for within-employee sorting separately. On the contrary, within-firm sorting seems to be present, especially at the extensive margin. In other words, the results are in line with the notion that productive employees self-select into PRP contracts, in general and within organisations. These findings could also be driven by reverse causality due to a possible incentive effect of PRP and an inadequate proxy for productivity. A relationship between PRP and risk aversion or inequity aversion cannot be demonstrated. Perhaps only those who are productive want PRP.

Experimental evidence on PRP sorting by risk aversion is abundant, but risk aversion does not seem to matter in the field based on these results. A possible explanation is that there are many more aspects of choosing an employment contract in the field. These other aspects may outweigh risk considerations. However, this does not make sense with Bonin et al. (2007), who find that risk averse individuals are more likely to have jobs with low earnings risk. Apparently, risk averse agents avoid earnings risk, but not PRP.

My findings are in line with experimental findings on productivity sorting, though they could be entirely driven by an incentive effect. They improve upon the external validity of ex-

isting literature, but are subject to the obvious drawbacks of observational data. Randomisation cannot be used to disentangle sorting from incentives, sample selection causes upward bias in the point estimates, self-reported data is prone to errors, and productivity is only operationalised by inadequate proxies.

Practitioners are advised to be aware of productivity sorting and consider using PRP to attract a productive workforce. Moreover, they should take within-firm sorting into consideration. The most productive employees within an organisation are more likely to have PRP. If this is self-selection, management can offer PRP contracts to learn more about individual productivity of their employees. Within-firm sorting may also appear because management is able to identify the best performing employees and offer them PRP contracts. Care should be taken, though, because the results may be subject to simultaneous causality and other biases.

The results presented in this study are silent on whether individuals self-select or are recruited. Future research could explore this if more detailed employer-employee data becomes available. In addition, the dependent PRP variables do not allow to distinguish between different kinds of PRP, such as piece-rates, tournaments, and bonuses awarded at the manager's discretion. It would be interesting to study those using observational data from a broad range of individuals and organisations. Further, since inequity aversion does not seem important for who has PRP based on the present study, it might be important whether those payments are common knowledge. In this respect, PRP could affect workplace morale or relationships between colleagues. Hence, instead of merely asking who chooses PRP, we should find out more about the social consequences of PRP as well.

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Appendix

Table A1: Attrition

	Dependent variable: 1 if PRP					
	Productivity			Risk & Inequity Aversion		
	(1)	(2)	(3)	(4)	(5)	(6)
1 if present in all waves	0.019			0.029**		
	(0.012)			(0.011)		
1 if present in next wave		0.002			0.012*	
		(0.008)			(0.007)	
Number of waves present			0.013**			0.016***
			(0.007)			(0.006)
Constant	0.587***	0.596***	0.567***	0.584***	0.592***	0.561***
	(0.006)	(0.002)	(0.013)	(0.006)	(0.003)	(0.013)
Model	RE	FE	RE	RE	FE	RE
R-squared	0.000	0.000	0.001	0.001	0.000	0.001
Observations	11,284	11,284	11,284	14,565	14,565	14,565

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Attrition

	Dependent variable: 1 if contractual					
	Productivity			Risk & Inequity Aversion		
	(1)	(2)	(3)	(4)	(5)	(6)
1 if present in all waves	-0.040***			-0.031***		
	(0.013)			(0.012)		
1 if present in next wave		0.003			0.002	
		(0.011)			(0.009)	
Number of waves present			-0.016**			-0.013*
			(0.007)			(0.007)
Constant	0.778***	0.770***	0.798***	0.771***	0.764***	0.788***
	(0.006)	(0.003)	(0.015)	(0.006)	(0.004)	(0.014)
Model	RE	FE	RE	RE	FE	RE
R-squared	0.002	0.000	0.001	0.001	0.000	0.000
Observations	6,663	6,663	6,663	8,610	8,610	8,610

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Attrition

	Dependent variable: Percentage					
	Productivity			Risk & Inequity Aversion		
	(1)	(2)	(3)	(4)	(5)	(6)
1 if present in all waves	0.3			-0.6		
	(1.1)			(1.0)		
1 if present in next wave		-2.6**			-1.4*	
		(1.0)			(0.8)	
Number of waves present			-0.1			-0.3
			(0.6)			(0.6)
Constant	27.2***	28.2***	27.4***	27.7***	28.3***	28.1***
	(0.6)	(0.3)	(1.3)	(0.5)	(0.4)	(1.2)
Model	RE	FE	RE	RE	FE	RE
R-squared	0.000	0.001	0.000	0.000	0.000	0.000
Observations	4,097	4,097	4,097	5,239	5,239	5,239

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Attrition

	Dependent variable: Paid out					
	Productivity			Risk & Inequity Aversion		
	(1)	(2)	(3)	(4)	(5)	(6)
1 if present in all waves	147			-80		
	(307)			(273)		
1 if present in next wave		48			8	
		(246)			(196)	
Number of waves present			95			-68
			(173)			(161)
Constant	5,279***	5,505***	5,136***	5,203***	5,421***	5,314***
	(152)	(76)	(354)	(142)	(87)	(340)
Model	RE	FE	RE	RE	FE	RE
R-squared	0.001	0.001	0.001	0.000	0.000	0.000
Observations	3,878	3,878	3,878	4,977	4,977	4,977

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Attrition

	Dependent variable: Non-contractual					
	Productivity			Risk & Inequity Aversion		
	(1)	(2)	(3)	(4)	(5)	(6)
1 if present in all waves	197*			157*		
	(104)			(92)		
1 if present in next wave		-13			-68	
		(101)			(77)	
Number of waves present			137**			110**
			(58)			(53)
Constant	1,745***	1,821***	1,534***	1,702***	1,816***	1,529***
	(52)	(30)	(119)	(48)	(33)	(112)
Model	RE	FE	RE	RE	FE	RE
R-squared	0.002	0.000	0.003	0.002	0.000	0.002
Observations	2,374	2,374	2,374	3,069	3,069	3,069

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Within-Employee Productivity

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed outside	0.020	0.014	-0.021	-0.019	-1.4	-1.9	-859	-896	415	429*
agreed scale rate	(0.024)	(0.024)	(0.029)	(0.028)	(3.3)	(3.3)	(789)	(789)	(253)	(258)
Constant	0.589***	-5.462***	0.778***	6.088	26.9***	-50.0**	5,760***	1,365	1,685***	923
	(0.007)	(0.514)	(0.010)	(27.503)	(1.1)	(24.7)	(256)	(5,782)	(81)	(2,403)
Model	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.010	0.003	0.000	0.000	0.002	0.002	0.148	0.002	0.075	0.013
Observations	11,761	11,761	6,922	6,922	4,222	4,222	4,005	4,005	2,457	2,457

Notes: Regression results. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Within-Firm Productivity

	1 if PRP		1 if contractual		Percentage (standardised)		Paid out (standardised)		Non-contractual (standardised)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed outside agreed scale rate	0.121***	0.085***	0.061***	0.037**	0.057*	0.142***	0.568***	0.335***	0.397***	0.314***
	(0.011)	(0.012)	(0.013)	(0.015)	(0.035)	(0.041)	(0.039)	(0.041)	(0.051)	(0.052)
Self-efficacy (standardised)	0.003	-0.001	0.008	0.003	0.034*	0.008	0.004	0.015	0.022	0.022
	(0.005)	(0.006)	(0.006)	(0.007)	(0.018)	(0.021)	(0.017)	(0.020)	(0.024)	(0.026)
Constant	0.568***	0.563***	0.765***	0.921***	-0.012	0.272	-0.158***	-0.980***	-0.098***	-1.421***
	(0.006)	(0.125)	(0.008)	(0.153)	(0.023)	(0.568)	(0.021)	(0.351)	(0.029)	(0.501)
Model	Firm FE	Firm FE	Firm FE	Firm FE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.411	0.435	0.310	0.336	0.003	0.052	0.097	0.197	0.042	0.187
Observations	10,207	10,207	6,089	6,089	3,311	3,311	3,226	3,226	1,773	1,773

Notes: Regression results. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standardised variables have been constructed by subtracting the within-firm mean and dividing by the within-firm standard deviation. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Within-Firm Risk & Inequity Aversion

	1 if PRP		1 if contractual		Percentage (standardised)		Paid out (standardised)		Non-contractual (standardised)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Risk aversion	-0.017***	-0.002	-0.011**	-0.003	-0.011	0.003	-0.077***	-0.017	-0.040*	-0.008
(standardised)	(0.005)	(0.005)	(0.006)	(0.006)	(0.018)	(0.019)	(0.016)	(0.016)	(0.021)	(0.021)
Inequity aversion	-0.014***	-0.009*	-0.001	0.003	0.011	0.033*	-0.047***	-0.027	-0.042**	-0.034
(standardised)	(0.004)	(0.005)	(0.006)	(0.006)	(0.017)	(0.018)	(0.017)	(0.017)	(0.021)	(0.021)
Constant	0.623***	0.565***	0.766***	0.917***	-0.028	0.293	-0.005	-0.829**	0.015	-1.658***
	(0.008)	(0.106)	(0.010)	(0.133)	(0.030)	(0.480)	(0.029)	(0.396)	(0.039)	(0.442)
Model	Firm FE	Firm FE	Firm FE	Firm FE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.405	0.430	0.303	0.324	0.000	0.048	0.010	0.165	0.004	0.148
Observations	13,262	13,262	7,959	7,959	4,242	4,242	4,136	4,136	2,291	2,291

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standardised variables have been constructed by subtracting the within-firm mean and dividing by the within-firm standard deviation. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9: Productivity, Risk & Inequity Aversion

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed outside agreed scale rate	0.085***	0.044***	0.009	-0.025*	-1.8*	0.2	5,461***	3,424***	1,145***	802***
	(0.011)	(0.011)	(0.011)	(0.013)	(1.0)	(1.1)	(318)	(316)	(113)	(105)
Self-efficacy	-0.003	0.002	-0.001	-0.004	0.4	-0.1	-1	124	-41	-3
	(0.004)	(0.004)	(0.004)	(0.005)	(0.4)	(0.4)	(88)	(103)	(33)	(37)
Risk aversion	-0.009***	-0.002	-0.008***	-0.004	-0.2	-0.2	-259***	-179***	-39	2
	(0.003)	(0.003)	(0.003)	(0.003)	(0.3)	(0.3)	(64)	(66)	(25)	(25)
Inequity aversion	-0.006**	-0.000	-0.003	-0.001	0.0	0.3	-232***	-130**	-59***	-21
	(0.003)	(0.003)	(0.003)	(0.003)	(0.3)	(0.3)	(61)	(60)	(21)	(22)
Constant	0.672***	0.422***	0.835***	1.038***	21.9***	51.5**	5,999***	376	2,498***	-119
	(0.053)	(0.148)	(0.059)	(0.185)	(5.3)	(20.6)	(1,221)	(2,390)	(471)	(913)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.012	0.108	0.002	0.042	0.003	0.055	0.159	0.267	0.080	0.234
Observations	11,255	11,255	6,651	6,651	4,094	4,094	3,871	3,871	2,371	2,371

Notes: Regression results. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10: Productivity (standard errors clustered at the firm level)

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed outside	0.086***	0.043***	0.011	-0.026*	-1.7	0.3	5,548***	3,442***	1,134***	805***
agreed scale rate	(0.014)	(0.014)	(0.013)	(0.014)	(1.3)	(1.3)	(350)	(327)	(131)	(121)
Self-efficacy	0.000	0.002	0.001	-0.003	0.5	-0.1	76	148	-26	-5
	(0.004)	(0.004)	(0.004)	(0.005)	(0.3)	(0.4)	(91)	(105)	(33)	(37)
Constant	0.564***	0.438***	0.755***	1.004***	20.9***	52.6***	2,748**	-1654	1,847***	-208
	(0.050)	(0.144)	(0.053)	(0.191)	(4.5)	(20.0)	(1,136)	(2,444)	(438)	(865)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.010	0.108	0.001	0.044	0.002	0.055	0.152	0.264	0.075	0.233
Observations	11,102	11,102	6,582	6,582	4,041	4,041	3,878	3,878	2,357	2,357

Notes: Regression results. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the firm level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: Risk & Inequity Aversion (standard errors clustered at the firm level)

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Risk aversion	-0.011***	-0.003	-0.007**	-0.003	-0.3	-0.3	-347***	-188***	-44*	3
	(0.003)	(0.003)	(0.003)	(0.003)	(0.3)	(0.3)	(69)	(64)	(24)	(22)
Inequity aversion	-0.007***	-0.001	-0.004	-0.000	-0.1	0.1	-236***	-133**	-38**	-12
	(0.003)	(0.002)	(0.003)	(0.003)	(0.2)	(0.3)	(57)	(55)	(18)	(18)
Constant	0.694***	0.606***	0.816***	0.983***	29.8***	47.3**	7,584***	2,063	2,044***	439
	(0.022)	(0.127)	(0.023)	(0.169)	(1.8)	(18.7)	(533)	(1,896)	(178)	(706)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.003	0.103	0.002	0.040	0.001	0.049	0.013	0.215	0.003	0.193
Observations	14,362	14,362	8,522	8,522	5,177	5,177	4,977	4,977	3,051	3,051

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Non-binary dependent variables have been winsorised at 5% in the upper tail. Standard errors clustered at the firm level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A12: Productivity (weighted)

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed outside	0.081***	0.038***	0.008	-0.027*	-1.8	-0.3	5,409***	3,190***	1,072***	737***
agreed scale rate	(0.014)	(0.014)	(0.015)	(0.016)	(1.3)	(1.4)	(334)	(353)	(119)	(119)
Self-efficacy	0.002	0.005	0.003	-0.002	0.4	-0.4	34	124	-39	-14
	(0.004)	(0.005)	(0.005)	(0.006)	(0.4)	(0.5)	(114)	(131)	(40)	(47)
Constant	0.536***	0.374**	0.745***	0.995***	22.0***	52.8**	3,248**	-851	2,012***	173
	(0.056)	(0.175)	(0.064)	(0.229)	(5.7)	(20.8)	(1,465)	(4,874)	(520)	(2,033)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	11,284	11,284	6,663	6,663	4,097	4,097	3,878	3,878	2,374	2,374

Notes: Regression results, estimated using MLE instead of GLS. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Non-binary dependent variables have been winsorised at 5% in the upper tail. Observations are weighted by the inverse frequency of appearance in the panel. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A13: Risk & Inequity Aversion (weighted)

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Risk aversion	-0.012***	-0.005	-0.008**	-0.003	-0.4	-0.4	-347***	-214**	-28	8
	(0.003)	(0.003)	(0.004)	(0.004)	(0.3)	(0.3)	(87)	(85)	(30)	(29)
Inequity aversion	-0.005*	0.001	-0.003	0.000	0.1	0.4	-197**	-114	-45*	-24
	(0.003)	(0.003)	(0.003)	(0.003)	(0.3)	(0.3)	(77)	(75)	(26)	(25)
Constant	0.688***	0.590***	0.813***	0.968***	29.6***	44.1**	7,383***	2,578	1,993***	698
	(0.024)	(0.148)	(0.027)	(0.194)	(2.3)	(18.4)	(610)	(4,167)	(213)	(1,828)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	14,565	14,565	8,610	8,610	5,239	5,239	4,977	4,977	3,069	3,069

Notes: Regression results, estimated using MLE instead of GLS. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Non-binary dependent variables have been winsorised at 5% in the upper tail. Observations are weighted by the inverse frequency of appearance in the panel. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A14: Productivity (unwinsorised)

	Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)
Employed outside	-0.9	0.8	9,472***	5,636***	2,000***	1,491***
agreed scale rate	(1.2)	(1.4)	(1,015)	(793)	(387)	(340)
Self-efficacy	0.5	-0.2	614**	772**	101	193
	(0.4)	(0.5)	(300)	(312)	(101)	(158)
Constant	21.6***	54.0**	-3589	-3913	641	-4444
	(5.3)	(21.2)	(3,928)	(7,119)	(1,243)	(3,833)
Model	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
R-squared	0.001	0.056	0.044	0.104	0.031	0.108
Observations	4,097	4,097	3,878	3,878	2,374	2,374

Notes: Regression results. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A15: Risk & Inequity Aversion (unwinsorised)

	Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)
Risk aversion	-0.3	-0.4	-780***	-499***	-114	22
	(0.3)	(0.3)	(163)	(163)	(103)	(94)
Inequity aversion	-0.2	0.1	-225	-46	-23	11
	(0.3)	(0.3)	(196)	(195)	(76)	(86)
Constant	32.4***	49.2**	10756***	5,155	2,867***	-1089
	(2.1)	(19.6)	(1,162)	(6,085)	(487)	(2,225)
Model	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
R-squared	0.001	0.048	0.006	0.092	0.001	0.085
Observations	5,239	5,239	4,977	4,977	3,069	3,069

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A16: Productivity (controlled for gross & net pay)

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed outside	0.083***	0.024**	0.012	-0.033**	-1.8*	-0.0	5,613***	2,603***	1,125***	612***
agreed scale rate	(0.011)	(0.012)	(0.012)	(0.014)	(1.1)	(1.3)	(333)	(320)	(116)	(98)
Self-efficacy	-0.000	-0.001	0.003	-0.002	0.4	-0.0	65	91	-28	-1
	(0.004)	(0.004)	(0.004)	(0.005)	(0.4)	(0.5)	(90)	(102)	(34)	(35)
Constant	0.571***	0.432***	0.726***	1.038***	22.0***	50.1**	2,898**	-2860	1,862***	-2334**
	(0.050)	(0.153)	(0.057)	(0.194)	(4.9)	(21.6)	(1,155)	(2,309)	(432)	(1,129)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.009	0.126	0.001	0.047	0.002	0.057	0.159	0.326	0.074	0.313
Observations	9,760	9,760	5,760	5,760	3,646	3,646	3,674	3,674	2,241	2,241

Notes: Regression results. Data originates from waves 2014-2015 and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Self-efficacy is the sum of three different self-reported values of self-efficacy on 5-point scales. Gross and net pay are included along with the other control variables. Non-binary dependent variables and gross and net pay have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A17: Risk & Inequity Aversion (controlled for gross & net pay)

	1 if PRP		1 if contractual		Percentage		Paid out		Non-contractual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Risk aversion	-0.011***	-0.002	-0.008**	-0.003	-0.3	-0.3	-348***	-160**	-47**	1
	(0.003)	(0.003)	(0.003)	(0.003)	(0.3)	(0.3)	(70)	(64)	(23)	(22)
Inequity aversion	-0.007***	0.001	-0.005**	-0.001	-0.0	0.2	-245***	-57	-48**	4
	(0.003)	(0.003)	(0.003)	(0.003)	(0.2)	(0.3)	(60)	(55)	(20)	(19)
Constant	0.699***	0.524***	0.822***	1.021***	29.8***	45.5**	7,762***	-1134	2,140***	-2387***
	(0.020)	(0.131)	(0.021)	(0.171)	(1.9)	(19.9)	(495)	(1,839)	(163)	(898)
Model	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.003	0.123	0.002	0.044	0.001	0.051	0.013	0.297	0.003	0.295
Observations	12,590	12,590	7,445	7,445	4,654	4,654	4,705	4,705	2,892	2,892

Notes: Regression results. Data originates from waves 2012-2013, 2014-2015, and 2016-2017 of the Linked Personnel Panel, a representative survey of German employees. Performance-related pay (PRP) paid out and PRP paid out without contract are measured in euro amounts. Risk-aversion is self-reported on an 11-point scale. Inequity aversion is the sum of two self-reported values of positive and negative inequity aversion, both on a five-point scale. Gross and net pay are included along with the other control variables. Non-binary dependent variables and gross and net pay have been winsorised at 5% in the upper tail. Standard errors clustered at the employee level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.