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## ORIGINAL ARTICLE

# Performance evaluations and employee turnover intentions: Empirical evidence from linked employer–employee data

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## Abstract

In this article, we study whether performance evaluations can serve as an instrument for firms to increase employee retention. Feedback on one's own performance may affect individual turnover intentions differently depending on the relative wage rank of workers among their peers. In line with these considerations, empirical evidence based on panel employer–employee data shows that relatively low-paid employees decrease their turnover intentions after the implementation of a performance evaluation system at the establishment level. We find no effect for relatively high-paid employees.

## JEL CLASSIFICATION

M51, M54, J63, C23

## INTRODUCTION

Firms are typically interested in preventing their employees from quitting, as the resources firms spend on recruiting and developing employees constitute a significant portion of total labor costs (see, e.g., Dube et al., 2010; Muehlemann & Leiser, 2018). In this article, we argue that firms can use performance evaluations to reduce information asymmetries and provide pathways for future prospects within the firm, thereby increasing employee retention. The latter is crucial for the firm to prevent employee quits and clearly depends on good working conditions, decent salaries and promising career options (see, e.g., Clark, 2001; Cottini et al., 2011; Frederiksen, 2017; Paul & Scott, 2011). But existing career options need to be recognized by employees, and there is a growing perception that people make systematic mistakes when assessing their future prospects within or outside their current employer.<sup>1</sup> Therefore, we

<sup>1</sup>An abundance of evidence from the lab has identified over- and underconfidence of individuals regarding their ability. In the field, Hoffman and Burks (2020) or Huffman et al. (2022) detect significant and persistent overconfidence. Jäger et al. (2021) find that employees systematically have wrong beliefs about their outside options, i.e., the wages they could earn elsewhere.

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suggest that it is very likely that employees also have incomplete perceptions about their career options.

In this study, we analyze the relationship between the introduction of firm-level performance evaluations and employee turnover intentions empirically based on four waves of a linked employer–employee panel data set of German firms, the Linked Personnel Panel (LPP), which can be combined with social security records from the Federal Employment Agency for all workers in surveyed establishments. Turnover intentions reflect the employee's own impetus to leave the organization and can therefore be interpreted as a direct behavioral response to work-related changes. The intention to leave might translate into actual quits, but dissatisfied employees who consider changing jobs but do not do so can also contribute to productivity losses and thus cause economic costs.

Using the administrative data to calculate relative residual wage positions within firms, we analyze how the introduction of a performance evaluation system at the establishment level influences the employees' turnover intentions depending on their relative performance. To assess this relationship, we exploit within-individual variation and estimate fixed effects and first difference specifications. In addition, the rich data allows us to shed light on mechanisms to some degree. In particular, we examine how job satisfaction and individual perceptions of fairness and promotion criteria change when performance evaluations are implemented.

This article focuses on the overall management strategy to implement performance evaluations and does not consider the specific design of a performance evaluation system.<sup>2</sup> Descriptive analyses indicate that establishments that introduce performance evaluation systems are comparable to other firms with respect to most dimensions, such as firm size, sector composition, wage premia, performance pay systems, support in decision making or promotion criteria. We further show that the introduction of performance evaluations often comes along with a bundle of HR practices that likely influence career prospects such as target agreements or personnel development plans.

In the next step, we examine the impact of the introduction of a performance evaluation system on within-individual changes in turnover intentions and document an overall negative impact on the intention to leave of professional employees.<sup>3</sup> To separate the change in the provision of performance evaluations from further adjustments, we control for changes in other HR instruments and employment conditions at the individual or establishment level. Moreover, we estimate different specifications to study directly the impact of the introduction of clusters of HR practices. First, we make use of a survey question that asks establishments whether the introduction of the performance evaluation system only affected the area of employee assessment or whether changes also took place in other areas. In further specifications, we consider only the introduction of a performance evaluation system that is not accompanied by the introduction of target agreements or performance pay schemes or personnel development plans. In sum, these analyses show that the introduction of performance evaluations has a direct impact on the turnover intentions of employees irrespective of whether evaluations are implemented within a broader set of HR practices or not. Finally, we exploit information on the triggers for introducing performance evaluations

<sup>2</sup>The design of the performance evaluation system is matter of interest in many studies. In lab and field experiments, scholars establish individual versus relative performance evaluations, vary the information which is revealed to the employee, or vary the timing and the frequency of the feedback talks. As in Azmat and Iriberry (2016), performance feedback is often combined with other measures like the compensation system.

<sup>3</sup>Thereby our measured treatment does not capture whether an employee is actually treated by the implementation of the evaluation system. Although information on the actual treatment of individuals is available in our data, employees who are subject to performance evaluations might be a highly selected group, while the introduction of a performance evaluation system for all employees at the establishment level is less likely to be driven by the productivity of individual employees.

at the establishment level. The most commonly indicated triggers are new ideas of the management, positive internal experience, and internal problems. In a sensitivity analysis, we distinguish two types of triggers, those that relate to innovations or external requirements and those that relate to internal experiences and problems. Our results are very similar for both types of triggers.

Individual intentions to leave the organization are influenced by compensation, career prospects, and perceptions of organizational support, among other factors. Therefore, the impact of performance evaluations on employees' turnover intentions is likely to depend on the relative performance of the worker. Since we do not have a direct measure of relative performance, we use a proxy by assigning employees according to their observed rank position in the residual wage distribution of their peer group within the same establishment. The idea behind this approach is that firms often incentivize their employees by linking their pay to performance, which leads to wage dispersion between employees with similar characteristics performing similar tasks (see, e.g., Lazear, 2018). Specifically, we predict the wage of each individual conditional on observable characteristics such as gender, age, professional degree and the employment history. Then we calculate the residual wage within an establishment-occupation-job-level cell. In this way, we are able to determine the relative rank (below or above the median of the residual wage distribution) of an individual employee among a very similar group of co-workers. However, our relative rank measure only partially reflects relative performance in the economic sense, but rather the decision of employers to pay some workers within a comparable group better than others.<sup>4</sup> Therefore, we use the term relative pay measure in the following.

Our results suggest that below-median paid employees decrease their turnover intentions after the implementation of a performance evaluation system. For those paid above the median, we do not find a change in turnover intentions. These results are confirmed by looking at actual job search or employer switches. Moreover, we find that relatively low paid are more satisfied with their job and perceive promotion criteria as more objective after the introduction of performance evaluations.

This article contributes to two different strands of literature. First, it contributes to the literature on relative wage positions and quit behavior which documents mixed results. Using linked employer–employee data from Germany, Pfeifer and Schneck (2012) find that workers with higher relative wage positions within their firms are, on average, more likely to quit their jobs than those with lower relative wage positions. The authors argue that this can be explained by the signal of few internal career advancement opportunities.<sup>5</sup> In contrast, Mohrenweiser and Pfeifer (2023) document a positive correlation between quit intentions and wages of co-workers in the same firm using the first two waves of the LPP and Godechot and Senik (2015) find no significant correlations based on a French employer–employee database.

Our study helps to shed light on the mixed findings on the relationship between relative wage positions and turnover by exploring the introduction of a performance evaluation system as an important moderator. Thereby we aim to extend the current literature in this direction to show whether the potential or intended revelation of internal career opportunities through a general performance evaluation system influences the intention to leave differently depending on the relative performance of workers among their peers. The revelation of relative performance could motivate the high-performing workers to search externally for jobs, as found by Pfeifer and Schneck (2012), who suggest that signaling few internal career prospects drives the quit behavior

<sup>4</sup>This decision may also be influenced by other aspects of wage determination, such as unobserved job characteristics, bargaining power or discrimination.

<sup>5</sup>See also, e.g., Clark et al. (2009) who find the same pattern for the relationship between relative wages and individual job satisfaction.

of employees with higher relative wage positions. But our results indicate that the introduction of a performance evaluation system in the firm does not significantly affect the turnover intentions of this group. This can presumably be explained by the fact that relatively high-paid employees are already sufficiently informed about their current wage rank and their future career opportunities within the organization. Instead, we observe a negative impact on the turnover intentions of lower paid employees that might partly be explained by the more precise signal of career and development prospects. Although we cannot empirically identify the potential drivers of this effect, our further analyses of other measures of affective behavior suggest that improvements in perceptions of fairness and organizational support related to career opportunities play some role.

In addition, our study adds to the recent literature on performance evaluations and the impact on job transitions, which is only a small strand of the literature among the many studies on performance evaluations and other outcomes. Existing studies rely on personnel data of single firms and show a negative relationship between performance evaluations and job transitions. Based on the data of six large companies, Frederiksen et al. (2017) document a negative correlation between performance ratings and separation rates. In two firms, where it is possible to disentangle quits from dismissals, both types of exits are negatively correlated with performance, and the correlation between performance and dismissals is stronger. These correlations are also confirmed by Cappelli and Conyon (2018) who analyze data from one large U.S. Corporation. Using personnel records from a car sales company, Takahashi et al. (2021) find that lower-than-expected evaluations lead to employee quits only when the supervisor is inexperienced, but there is no association with quits when the unexpectedly lower evaluation is given by an experienced supervisor.<sup>6</sup>

We contribute to this literature by showing that the revelation and discussion of performance through a general performance evaluation system in the firm could have an impact on the correlation between performance (measured in relative wage rank positions) and turnover intentions. Hence, a firm that is under pressure to retain its employees, even if they are not top performers, might therefore consider using such an evaluation system to motivate its employees to stay with the organization.

The recent economic literature mainly focuses on the impact of performance evaluations on performance and motivational outcomes in lab experiments (see, e.g., Azmat & Iriberry, 2016; Gill et al., 2019; Kuhnén & Tymula, 2012). Azmat and Iriberry (2016) for instance, find in a lab experiment that relative performance feedback increases the subsequent effort of employees who perform under a piece-rate incentive scheme. They do not find significant treatment effects under a flat-rate system. Interestingly, this result holds independently of the content of the feedback; hence whether the feedback-receiving person was performing above or below average. However, Azmat and Iriberry (2016) also find that the content of the feedback matters. Contrary to the findings on performance, the authors find very different effects on satisfaction for below- and above-average performers: receiving positive (negative) feedback increases (decreases) individuals' subjective well-being and feeling of dominance but again only under a piece-rate incentive scheme.

To sum it up, our study is the first comprehensive analysis of the relationship between the provision of a performance evaluation system, relative ranks and individual turnover intentions. For this purpose, we use a unique source of field data, a longitudinal linked employer–employee survey combined with administrative records, which allows us to overcome the drawback that personnel records from single firms or data gained through lab or field experiments might be dominated by the specific setting in the firm or in the experiment. We first provide descriptive evidence on the type of firms that introduce a performance evaluation system, the triggers for the implementation and whether other HR practices are introduced simultaneously. Second, we analyze which group of workers,

<sup>6</sup>In a similar vein, Giuliano et al. (2011) find that workers are less likely to quit or be dismissed if they are the same race as their manager. Engellandt and Riphahn (2011) demonstrate the importance of flexible individual performance evaluations and the implicit cost of favoritism.

measured by their relative wage rank, changes their turnover intentions after the implementation of a performance evaluation system and document that relatively low-paid employees reduce their turnover intentions while relatively high-paid employees do not. Our results are also of direct value for practice: apart from monetary incentives, performance evaluations might represent an HR strategy to reach all employees and contribute to a work environment where personnel decisions such as promotions are more likely to be based on objective criteria. This can reduce individual turnover intentions and hence possibly also serve as an instrument for firms to increase employee retention.

The rest of the article is structured as follows. Section 2 provides theoretical considerations. Section 3 describes the data source, the measurement of variables that are relevant for our analysis and the estimation sample. Section 4 presents the empirical approach and the results. Section 5 concludes.

## THEORETICAL CONSIDERATIONS

From a theoretical perspective, the relationship between performance evaluations and employee turnover intentions is not obvious. In the following, we discuss three main drivers that could differentially affect turnover intentions, especially when heterogeneity in performance within narrow groups of workers is taken into account. The first driver is the firm's motive to align its employees' incentives with its own. The second is the provision of information on employee performance, which reduces asymmetric information about career prospects. The third are employees' behavioral responses to perceived organizational support.

Primarily, firms might implement a structured performance evaluation system to better align incentives of their employees with their own incentives and increase in this way firm productivity.<sup>7</sup> When setting incentives, individual bonuses are commonly based on the performance indicators that are determined through assessment processes (see, e.g., empirical evidence by Cappelli & Conyon, 2018; Frederiksen et al., 2017; Kampkötter & Sliwka, 2016; Kuhnen & Tymula, 2012). In a work environment where workers perform many different tasks and work in teams, performance will be inadequately assessed by objective measures such as sales or financial figures. As a result, most performance evaluations in practice are based on subjective assessments by supervisors (Kampkötter & Sliwka, 2016). Theoretical literature relying on principal-agent models has analyzed the use of subjective evaluation to incorporate hard-to-measure tasks in an incentive contract that ties compensation to performance (see, e.g., Baker et al., 1994; Chan & Zheng, 2011; MacLeod, 2003). Takahashi et al. (2021) provide empirical evidence based on personnel records from a car sales company and confirm that supervisors use the evaluations to incentivize employees to pursue non-sales tasks, such as mentoring junior representatives and building long-term customer relationships.

Kampkötter and Sliwka (2016) and Frederiksen et al. (2017) discuss typical aspects in the design of a performance evaluation system that are often applied in companies. A typical evaluation process takes place on a regular and structured basis. Firms commonly use annual cycles: at the beginning of the year, employees and supervisors meet to set goals, which are reviewed at the end of the year using a performance scale that ranges, for instance, from 1 “low rating” to 5 “high rating”. In most incentive schemes, the performance evaluation results then serve as the basis for performance pay. In addition, evaluation outcomes are used in the personnel planning process

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<sup>7</sup>Lazear (2000) documents that productivity increases significantly in an U.S. company that introduces a piece-rate compensation scheme. The gain is due to both an incentive effect meaning workers becoming more productive under performance pay and changes in employee turnover patterns. The author argues and shows that performance-based compensation, which requires a measure of performance, is more attractive to high performers.



for decisions on promotions, reallocations or dismissals. For instance, Frederiksen et al. (2017) show based on personnel data of six large companies and Cappelli and Conyon (2018) based on data from one large U.S. corporation that subjective performance ratings are positively related to several career outcomes such as pay, promotions, demotions, dismissals and quits.

The second driver focuses on reducing asymmetric information from the employee's perspective. Performance evaluations can involve the exchange of various types of information: First, performance evaluations provide direct "feedback" on where performance was good or not so good and what should be done differently in the future (Cappelli & Conyon, 2018). This can help employees identify their potential strengths and weaknesses and improve their prediction of internal and external career prospects. In addition to assessing current performance, performance evaluations can also be the starting point to derive a perspective for future development within the firm, for example by discussing and planning of goal-setting procedures, promotions or training measures (Bakker & Demerouti, 2007; Beenen et al., 2017). Thus, performance evaluations can serve as a tool to inform and guide employees by identifying internal pathways for advancement, such as reassigning tasks or investing in new skills. Finally, performance evaluations could include a discussion of why workers receive certain ratings and how they compare to their peers' ratings.

The considerations so far suggest that the impact of performance evaluations on employees' turnover intentions is likely to depend on the relative rank of the worker in the performance distribution. Assuming that ratings are not biased and reflect actual differences in performance,<sup>8</sup> high-performing employees receive a better rating than low-performing employees in their comparison group. As performance reviews allow to reward good performance and to sanction poor performance more adequately, this might, in turn, decrease the turnover intentions of high performers and increase the turnover intentions of low performers. The same predictions are obtained if the performance assessment by the supervisor is more likely to deviate negatively from the employee's own assessment for low performers and to deviate positively for high performers.

However, there might be opposing mechanisms that influence the impact of performance evaluations on the intention to leave the organization. First, better knowledge of internal career options could also influence the view of external career options. In line with this, Pfeifer and Schneck (2012) argue that higher wages of co-workers might signal better career prospects within the firm. Hence, relatively low-performing individuals might reduce their turnover intentions as they have underestimated their future career prospects or overestimated their outside options thus far. In contrast, if a worker is already situated at the top of the pay distribution, further career advancements in the current firm are unlikely and the worker may consider quitting the job and joining another firm. Moreover, generous ratings and little differentiation between workers might lead to comparatively better ratings of low performers and worse ratings of high performers and in this way counteract the intended impact of performance evaluations.

Finally, the third driver suggests that providing employees with information and guidance could have an overall positive impact on employee satisfaction and the decision to stay with the employer (Kampkötter, 2017). The original idea relates to the psychological literature on perceived organizational support (POS), which states that employees' commitment to their organization might be influenced by the organization's perception of commitment to them (Eisenberger et al., 1986). Based on the organizational support theory, empirical studies from that field show a strong relationship between POS and behavioral outcomes of employees such as affective commitment or job satisfaction (Kurtessis et al., 2017). Moreover, the studies show that POS is affected by three basic antecedents, which can be summarized as "fairness", "HR practices and working conditions", and "leadership"

<sup>8</sup>Several studies point to the possibility that subjective evaluation by supervisors is systematically biased (see, e.g., Frederiksen et al., 2017; Kampkötter & Sliwka, 2016, and the citations therein). For instance, subjective evaluations are known to be prone to "centrality bias", meaning that supervisors not sufficiently distinguish between workers and to "leniency bias", meaning that supervisors overstate their subordinates' performance.

(Eisenberger et al., 2020). Kurtessis et al. (2017), for example, find that perceived supervisor support and the perception of organizational politics are strongly correlated with POS. We expect that the introduction of a performance evaluation system can influence perceptions of supervisor support because the supervisor must view the employee individually, regardless of common work structures and behaviors. The organization-wide implementation of performance evaluations could also be seen as a tool to combat structures of favoritism, lack of meritocracy and lack of frank discussion. The strongest relationship between the antecedents of POS and performance evaluations is through the family of HR practices and working conditions. The introduction of a performance evaluation system could also be accompanied by improvements in development opportunities and enrichment of job characteristics.

Overall, these considerations suggest that there are opposing mechanisms and that we cannot make clear predictions about the effects of performance evaluations on the turnover intentions of low-performing versus high-performing employees. Therefore, we analyze this relationship empirically based on linked employer–employee data.

## DATA

### Data source and definition of variables

Our empirical analysis is based on the four waves (2012/13, 2014/15, 2016/17 and 2018/19) of the Linked Personnel Panel (LPP) which combines survey data of employers and employees. The data covers private sector establishments in Germany which employ at least 50 employees at the date of panel entry. The LPP can be linked with administrative data of the Federal Employment Agency which are based on employers' notifications to the social security authorities (LPP-ADIAB). While the employee survey covers a random sample of the establishment's workforce, the administrative records are available for ~85% of the employees. This fact makes the data exceptional and very well suited to our research question.<sup>9</sup>

Overall, the LPP is designed to conduct personnel economic research in Germany. The employer survey contains information on several HR instruments—prevalence, distribution and changes—and further information on establishment characteristics and policies. The employee survey collects information on working conditions, individual perceptions of personnel development and treatment by the employer, the supervisor and colleagues, as well as socio-demographics, personality traits and preferences. The administrative data include, alongside information on different labor market states, such as the start and end date of dependent employment, registered unemployment, registered job search or unemployment benefit receipt, individual information on (daily) wage records, job characteristics, as well as some socio-demographic information.

The simultaneous observation of both employers and employees over time allows analyses of the relationship between (changes in) HR practices in the establishment and the employees' behavior in response to them. Moreover, it solves the problem of common method bias which is often discussed in survey studies. In particular, the high reliability of administrative wage information of almost all employees for each establishment is an important asset of the data.

To measure the turnover intentions of employees, we make use of the question “How often have you thought of changing your current employer in the last 12 months?”. The answers can be: 1 “never”, 2 “several times a year”, 3 “several times a month”, 4 “several times a day” and 5

<sup>9</sup>See Kampkötter et al. (2016) and Mackeben et al. (2021) for a more detailed description of the data set.



“every day”. The data further include reasons why a job change was considered and we disregard cases of turnover intentions exclusively due to personal circumstances unrelated to the workplace.<sup>10</sup>

Our treatment variable relies on two employer survey questions. Employers are explicitly asked whether they use certain HR instruments and whether there have been any changes—such as an introduction—with respect to the three instruments performance evaluations, target agreements and performance pay in the last 2 years.<sup>11</sup> In addition, employers are asked about the triggers for this change. In a sensitivity analysis, we look separately at those cases in which performance evaluations were introduced due to innovations or external requirements and due to internal experiences or problems, respectively. Obviously, the treatment variable does not contain any information on the content or design of the performance evaluations. In a large-scale survey with several hundred establishments, the level of aggregation of such information must remain high. Therefore, the investigation of the impact of a performance evaluation design on turnover intentions is beyond the scope of this article.

In our empirical analysis, we compare the results of two different definitions of our treatment variable. First, we define a variable used in fixed effects specifications, indicating whether the establishment has a performance evaluation system or not. For establishments that state they introduced performance evaluations between two consecutive waves, this variable is set to one in the current and subsequent waves and zero in all previous waves. The comparison group consists of both types of establishments: those that never had nor implemented performance evaluations and those that always had performance evaluations. Employers who state that they have abolished performance evaluations are excluded from the analysis. The second variable relies on a before–after comparison, used in first difference specifications, and is defined as an indicator equal to zero if the establishment does not use performance evaluations and equal to one if performance evaluations are implemented. In this case, the comparison group consists of establishments that never had a performance evaluation system in place during the observation period. Figure A1 in the Appendix shows by means of an example the definition of the two treatment variables.

In the empirical specification, we also control for changes in other employee and employer characteristics, such as socio-demographic information (age and household composition), job characteristics (function, tasks, compensation, working hours), establishment size, and other HR practices (e.g., target agreements, personnel development plans, support measures for specific worker groups, and performance pay). To study the potential drivers of the effects, we consider job satisfaction and individual perceptions of fairness and promotion criteria as alternative outcome variables.

## Descriptive statistics of establishments

Our empirical analysis relies on a comparison of individuals who are employed in establishments which introduce performance evaluations with individuals who are employed in establishments which do not experience a change in the performance evaluation system. However, establishments might differ in observable characteristics even before the introduction takes place. Table A1 in the Appendix presents descriptive statistics of establishments

<sup>10</sup>This concerns only a few cases and including them does not change our results. The estimates are available on request.

<sup>11</sup>The questions are: “Is the performance of employees in your establishment evaluated by supervisors at least once a year?”, “Does your establishment have written target agreements?” and “Does your establishment have a salary system with variable components?” as well as “We are now talking about changes to the performance evaluation system, the written target agreements and the salary system with variable components. Have there been any changes in these areas in the last 2 years? These include the introduction, abolition, expansion and reduction of the respective HR instrument.”

categorized into three groups: those that always had a performance evaluation system in place, those that never had one, and those implementing it in the future, based on the initial observation in the data. In our sample, 59% always had a structured performance evaluation system, 34% never had nor introduce such a system and 7% implement one in the study window.

The descriptive statistics suggest that establishments that implement performance evaluations in the future are comparable to establishments that already have such a system in place with respect to most dimensions, such as firm size, sector composition, wage premia as measured by AKM establishment fixed effects,<sup>12</sup> performance pay systems, collective agreements, personnel development plans or support in decision making or promotion criteria. The only difference is with regard to target agreements and employee interviews: establishments that introduce performance evaluations in the future have made significantly less use of such practices in the past.

In contrast, there are more pronounced differences between establishments that introduce a performance evaluation system and those that never do. The latter tend to be smaller in size, are less likely to have other HR practices implemented, such as performance pay, employee interviews, personnel development plans or support measures for specific worker groups like women or low performers. However, they also use target agreements more frequently.

The implementation of a performance evaluation system might also be accompanied by the implementation of other HR instruments. Therefore, Table A2 in the Appendix presents a before-after comparison of selected HR instruments for establishments that introduce such a system during the observation period. According to the figures, the implementation of performance evaluations is accompanied by a introduction of target agreements, employee interviews as well as the introduction of personnel development plans.

In a next step, we perform a multivariate analysis on the determinants of introducing a performance evaluation system. Table A3 in the Appendix shows the marginal effects of a logit regression of the probability to implement performance evaluations at the establishment level. The specifications in column (1) and (2) suggest that the introduction of such a system is not systematically related to observable establishment characteristics and specific HR instruments measured before the introduction, with the only exception of target agreements. Establishments that already have target agreements are 11% points less likely to introduce a performance evaluation system (see column (2)). In column (3) of Table A3, we further include HR instruments that are introduced from one period to another.<sup>13</sup> First of all, the results indicate that the negative coefficient of target agreements vanishes once we control for the introduction of other HR instruments. In addition, column (3) suggests that performance evaluations and target agreements are likely to be introduced simultaneously. The same is true with respect to employee interviews and personnel development plans. Moreover, establishments that introduce performance evaluations are less likely to change the current job position of low performers. The introduction of a performance pay scheme is not significantly related to the introduction of performance evaluations.

<sup>12</sup>The establishment wage premia are based on the method pioneered by Abowd et al. (1999) and provided by the IAB. For a detailed description about the estimation of the AKM effects see Bellmann et al. (2020).

<sup>13</sup>Please note that employers are only explicitly asked about the introduction of the three HR instruments performance evaluations, target agreements and performance pay. For the other variables, we can only look at changes in the variables between two periods.

## Measuring the conditional relative rank position

In this article, we approximate relative pay by assigning employees according to their rank position in the residual wage distribution of their peer group within the same establishment. In our main analysis, we distinguish between employees ranked below and above the median of the residual wage distribution and refer to these as below-median and above-median paid employees.

To estimate the conditional relative rank position of each employee, we use the administrative data for all individuals employed for at least one day during the observation period in the observed establishments and who were covered by social security authorities. In a first step, we derive the predicted conditional daily wage of each individual  $i$  in establishment  $j$  in period  $t$ . The OLS estimations include gender, age, experience, tenure, unemployment experience, full-time indicator, number of job-changes, entry wage and year, degree, job level and occupational segment, and are estimated within each establishment  $j$  and period  $t$  using the following equation:

$$w_{i,jt} = \delta_{jt} + x'_{i,jt} \beta_{jt} + \epsilon_{i,jt} \quad (1)$$

In the next step, we rank the wage residual, the difference of the actual daily wage  $w_{i,jt}$  and the predicted daily wage  $\hat{w}_{i,jt}$ , among a certain group of co-workers which we call the peer group. The groups are determined by the job level-occupation segment combination at each establishment. Both are included in the five-digit code of occupations, the German Classification of Occupations 2010. The 2-digit aggregate of the code contains 14 occupational segments which are summarized based on tasks characterizing a job (Matthes et al., 2015). In addition, the level of qualification and responsibilities needed for the job is described in four job levels.<sup>14</sup> Frederiksen et al. (2017) confirm that the distinction by job levels is important as they find that job levels explain a large component of the variation in performance evaluations while experience and firm tenure fail to explain the variation.

Our analyses require a definition of the relative rank position that is not influenced by our treatment. Therefore, we use information on the individual relative rank position at the first year of the survey which is 2012 or the next earliest possible point in time when administrative data is available.

## Sample selection and descriptive statistics of individuals

In our empirical analysis, we use four subsequent biennial waves during the period 2012–2018. The employer data cover around 800 establishments per year and the survey of employees of these establishments amounts to 7100 individuals per year. The empirical analysis is based on those surveyed employers and employees who agreed on the linkage with their administrative records.

Our sample of employees is restricted to individuals who are observed at least twice. Moreover, we exclude employees from job level 1 for two reasons. First, we are interested in turnover intentions which are driven by the comparison of internal versus external career prospects and we expect the intentions to leave of non-professional employees to be mainly driven by other factors. Second, the LPP covers too few employees from this segment of the labor market. For similar reasons, we disregard employees in agricultural, food

<sup>14</sup>The first job level mainly comprises jobs where no professional qualification is necessary, the second level comprises the majority of jobs which require a secondary level vocational education (e.g., apprenticeship training), and the third and fourth levels are usually staffed with individuals holding a tertiary degree and who are qualified to take management responsibilities.

& hospitality, security and cleaning occupations as well as employees who carry out auxiliary activities.

One caveat of the administrative data is the fact that wages above the ceiling of the social security contributions are right-censored. Thus, the residual wages of individuals with predicted wages above this ceiling can only be negative by construction and may not be informative about relative pay. This makes it impossible to calculate the relative rank position of these individuals within the narrowly defined peer group (establishment-occupation-job level-cell). Therefore, we only consider observations with predicted wages below the ceiling of social security contributions (minus 2 Euros).<sup>15</sup> To determine the relative rank of each employee for a given occupation and job level within an establishment, we only look at job level-occupation cells with at least 4 employees.

With these reductions and by excluding observations with missings in key variables, we end up with a final estimation sample of 5403 observations which contain information on 2255 individuals working in 514 establishments. Table 1 provides descriptive statistics of the main variables used in the baseline specification. On average, the level of turnover intentions is 1.49 on a scale of 1 “never” to 5 “every day”. Converted into an indicator variable, this means that around a third of employees have thought about changing the employer at least several times a year. 70% of the employees are exposed to an establishment-level performance evaluation system over the whole observation period. We further observe that 6.4% of the employees who were not exposed to such a system at the establishment level in one period are treated by an implementation in the following period. Nearly 46% are classified as below-median paid employees and 54% as above-median paid employees.

In our sample, about one quarter of the employees are female. Due to the fact that the population of the LPP are private establishments with at least 50 employees (at the time of survey entrance) and additional restrictions, our sample is older and comprises an above-average level of qualification in comparison to all employees in Germany. Table 1 shows that 1.2% of the individuals have no professional qualification, whereas 83.5% completed an apprenticeship and 15.3% hold an academic degree. Approximately 82% of the employees are 40 years or older.

On average, surveyed employees in our sample work 40h a week including overtime and 29% hold a leadership position. Nearly 60% receive any kind of variable pay (including extraordinary one-time compensation). Table A4 in the Appendix presents summary statistics of additional covariates that are used in the empirical analysis. The table shows that, due to the restrictions of the sample, the wage distribution of the observed employees is somewhat compressed. Compared with the establishment-level distribution of wages, we observe more individuals earning wages around the median than at the tails.

As our empirical analysis is based on within-individual variation, Tables 1 and A4 also show the overall standard deviation as well as the standard deviation of the respective variables between and within individuals. The figures indicate that although the within standard deviations are smaller than the between standard deviations, we observe some changes within individuals over time. Nevertheless, low statistical power can lead to insignificant effects. Therefore, in addition to statistical significance, we also consider the effect size when interpreting the results.

Finally, Table A5 in the Appendix shows descriptive statistics measured in the first wave separately for employees who experience an implementation of performance evaluations in subsequent waves and those who do not. Both groups are quite similar with respect to turnover intentions, the share of relatively low- and high-paid employees, gender, qualification level, family background,

<sup>15</sup>An alternative way to deal with this issue would be to exclude all individuals belonging to establishment-occupation-job level-cells in which more than 50% of the individuals earn wages above the ceiling of the social security contributions. This modification leads to very similar estimation results (see Figure A4 in the Appendix).

TABLE 1 Descriptive statistics of individuals.

	Mean	SD			Min	Max
		Overall	Between	Within		
Outcomes						
Turnover intentions (1–5 scale)	1.486	0.830	0.744	0.404	1	5
Turnover intentions (dummy)	0.327	0.469	0.415	0.237	0	1
Treatment variables						
Performance evaluations (FE spec.)	0.700	0.458	0.443	0.132	0	1
Performance evaluations (FD spec.)	0.064	0.245	0.221	0.100	0	1
Relative wage rank						
Below median	0.457	0.498	0.499	0.000	0	1
Above median	0.543	0.498	0.499	0.000	0	1
Baseline control variables						
Female	0.254	0.435	0.438	0.000	0	1
Qualificational level						
None	0.012	0.107	0.114	0.000	0	1
Apprenticeship	0.588	0.492	0.490	0.000	0	1
Advanced apprenticeship	0.247	0.431	0.426	0.000	0	1
University/UAS	0.153	0.360	0.355	0.000	0	1
Partner	0.866	0.341	0.325	0.119	0	1
Number of children	0.365	0.730	0.698	0.245	0	6
Age < 30	0.048	0.213	0.215	0.084	0	1
Age 30–39	0.129	0.336	0.313	0.139	0	1
Age 40–49	0.330	0.470	0.426	0.212	0	1
Age ≥50	0.493	0.500	0.471	0.181	0	1
Leadership position	0.292	0.455	0.424	0.176	0	1
Job strain	3.579	1.174	1.016	0.627	1	5
Working hours	39.839	7.826	7.176	3.483	0	84
Job autonomy	3.968	0.975	0.842	0.520	1	5
Multitasking	4.171	0.923	0.781	0.525	1	5
Establishment size	680.122	2497.946	2659.476	70.864	7	25,935
Individual performance pay						
Variable pay	0.603	0.489	0.431	0.248	0	1

Note: N = 5403.

Abbreviations: FD spec., first difference specification; FE spec., fixed effects specification; SD, standard deviation; UAS, university of applied sciences.

Source: LPP-ADIAB 7519, own computations.

and some job characteristics such as having a leadership position and working hours. However, there are also differences with respect to some characteristics: individuals who work in establishments where performance evaluations are introduced in future are younger, are more likely to work in large establishments and are more likely to receive variable pay. Moreover, Table A5 indicates

that these individuals work more often in establishments which make use of other HR instruments such as employee interviews, employee surveys and investments in higher qualifications.

## EMPIRICAL ANALYSIS

### Empirical specification

To analyze the effects of the introduction of performance evaluations on employee turnover intentions, we exploit within-individual changes and estimate the following regression:

$$y_{ijt} = \delta + \gamma_1 PE_{jt} \times Rank\_low_{ij} + \gamma_2 PE_{jt} \times Rank\_high_{ij} + x'_{ijt} \beta + \epsilon_{ijt} + \psi_t + \alpha_i. \quad (2)$$

$y_{ijt}$  measures turnover intentions of individual  $i$  in establishment  $j$  in period  $t$ .  $PE_{jt}$  indicates whether performance evaluations are used as an HR instrument in establishment  $j$  in  $t$ . In our main specifications, we interact  $PE_{jt}$  with a time-constant dummy variable  $Rank\_low_{ij}$ , indicating that an individual's conditional relative rank position—as defined in the data section—lies below the median as well as with a dummy variable  $Rank\_high_{ij}$ , indicating that the rank lies above the median.  $x'_{ijt}$  is a vector of time-varying covariates including socio-demographic characteristics (partner, number of children and age), information on working conditions and job characteristics (leadership position, variable pay, job strain, actual working hours, job autonomy, multitasking) as well as establishment size.  $\psi_t$  represents year fixed effects and  $\alpha_i$  time-invariant individual fixed effects.  $\epsilon_{ijt}$  is an idiosyncratic error term. To eliminate the individual fixed effect, we apply both fixed effects and first difference specifications. In our sensitivity analyses, we also include information on other HR instruments as well as information on the actual wage level and the dispersion of wages within establishments. Moreover, we investigate whether the treatment effects differ by the triggers for introducing a performance evaluation system.

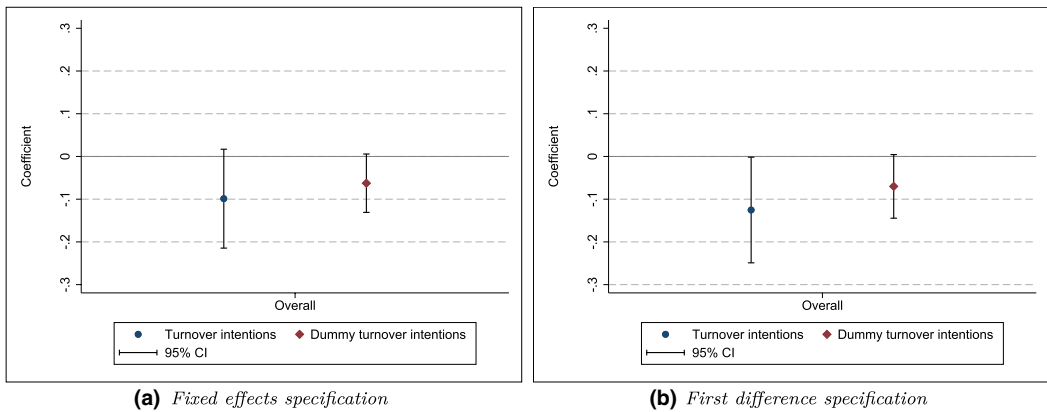
### Estimation results

We start our empirical analysis with Figure 1 which shows that the implementation of performance evaluations in establishments is, overall, related to a decrease in the turnover intentions of professional employees.<sup>16</sup> Panel (a) of Figure 1 shows the coefficient of performance evaluations in the fixed effects specification, i.e. we observe individuals in multiple periods and calculate the average effect. Panel (b) shows the coefficient by using the first difference specification which could alternatively be interpreted as a short-run effect. Here, we take only two observations (before and after) into account for individuals working in those firms that had no performance evaluation system in the first period (see the data section for a more precise definition). We show the coefficients for the turnover intentions measured on a 5-point Likert-scale and measured as a dummy variable, respectively.

The estimated coefficients in panel (a) and panel (b) are quite similar in size, although there are differences in significance. The relationship is negative but not significant at a 5% level in the left panel but we observe a significant impact on the ordinal variable of turnover intentions and a weakly significant impact for the dummy variable in the right panel. The results in panel (b) suggest that an employee exhibits a 7% points lower probability to think about a job change and 0.13 points lower turnover intentions on a 1–5 scale after the employer established

<sup>16</sup>The underlying estimation equation is:  $y_{ijt} = \delta + \gamma PE_{jt} + x'_{ijt} \beta + \epsilon_{ijt} + \psi_t + \alpha_i$ .





**FIGURE 1** Overall effect of performance evaluations on turnover intentions. Panel (a): Fixed effects specification; panel (b): First difference specification; outcomes: Turnover intentions (1–5 scale) and indicator for turnover intentions; plotted coefficients: Effect of performance evaluations on the establishment level; covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared), variable pay, year-FE.  $N = 5491$  (panel a) and 1854 (panel b). Source: LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

a general performance evaluation system. From now on, we focus on the results for the 5-point Likert-scale measure of turnover intentions. To test whether a linear model specification is appropriate in our setting, we estimate fixed effects models that explicitly account for the ordinal nature of the dependent variable. Following Van Praag and Ferrer-i Carbonell (2007), we apply a probit-adapted ordinary least squares estimator which yields similar results, as shown in Figure A2 in the Appendix. Therefore, we stick to the linear regression model in the following analyses.

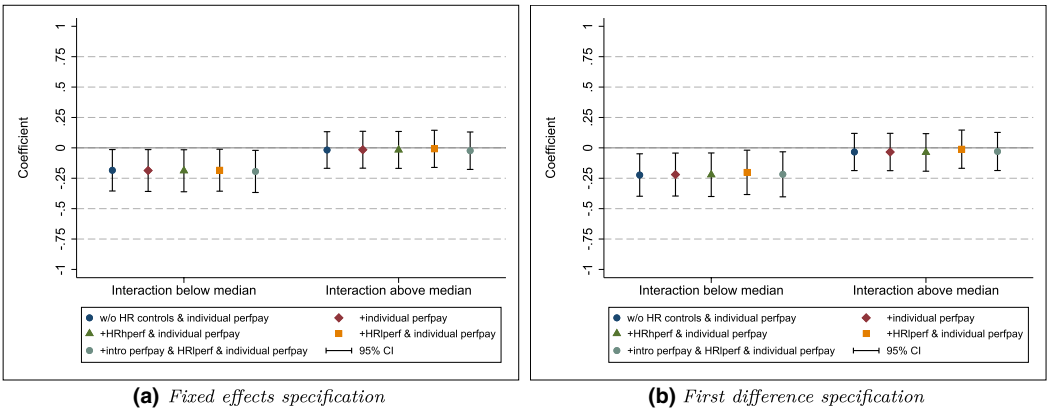
So far, we have seen that the revelation of performance has an overall negative impact on turnover intentions but our theoretical considerations suggest that there might be effect heterogeneity. Now, we take the conditional relative rank position described in the data section as a measure of relative pay and distinguish between employees paid below the median and employees paid above the median.<sup>17</sup>

## Confounding factors and the introduction of complementary HR practices

In a first step, we take a look at the coefficients of five different specifications to identify the preferred one. This is necessary as the descriptive analyses suggested that the implementation of performance evaluations comes along with the implementation of other HR instruments and a firm's broader HR strategy is likely to affect the turnover intentions of employees. Since we aim to estimate the specific impact of performance evaluations, we sequentially include other potentially confounding factors to avoid omitted variable bias.

We start with a baseline specification where only employee (age, partner, number of children) and job characteristics (leadership position, actual working hours, job autonomy, perceived job strain and variety of tasks) and the establishment size are included. Next, we investigate the relevance of variable pay at the individual level by enriching the baseline covariates with a dummy variable for individual performance pay. In the third specification, we additionally include information on whether the establishment conducts employee interviews

<sup>17</sup> Figure A3 in the Appendix shows that splitting the sample in four groups based on the quartiles of the rank distribution confirms a strong kink between the second and the third quartile.



**FIGURE 2** Effect of performance evaluations on turnover intentions by median of relative pay. Panel (a): Fixed effects specification; panel (b): First difference specification; outcome: Turnover intentions (1–5 scale); plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level; baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE.  $N=5403$ – $5500$  (panel a) and  $1809$ – $1857$  (panel b). Source: LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

and personnel development plans. The results in the Section 3.2 indicated that these practices are often simultaneously implemented with a performance evaluation system and may act in a similar direction; particularly, in the context of career opportunities. We therefore expect an upward bias if we do not control for these instruments.

The fourth specification includes—in addition to the former variables—information on special feedback for low performers, special training provided to low performers, and the promotion of women in management positions. It also includes information on the provision of training aimed at higher qualifications and whether employee surveys are conducted. Finally, the information about a personnel change in the executive board of the establishment is included in this specification.

Finally, we investigate more deeply whether short-term monetary incentives unrelated to future career prospects (at least not directly) could explain our findings. In particular, we examine whether a simultaneously introduced performance pay scheme at the establishment level has a joint impact on the turnover intentions. This could be the case as performance evaluations are often the floor where the magnitude of performance pay is discussed and is, thus, in some cases jointly implemented.

The respective coefficients of performance evaluations of the fixed effects and first difference specification are summarized in Figure 2. Although we already interacted the variable of interest with the group dummies, we compare the coefficients of the different specifications for every respective group first, before discussing the results regarding the two groups. The first dot from the left represents the respective coefficient of the baseline specification, whereas the other symbols represent the extended specifications in the above described order. Overall, the results point to the conclusion that our findings are robust to including further HR controls. The magnitude of the changes in coefficients is small and, hence, they are economically and statistically not significant. We also estimate specifications in which we control for the introduction of target agreements, a HR practice that is often jointly implemented with performance evaluations. Although the number of observations is substantially lower because of

missing information on the use of target agreements, the results are in line with the findings above.<sup>18</sup>

However, in line with the literature on POS (Eisenberger et al., 1986), one may argue that complementary HR policies will have the maximum impact when they are introduced jointly and we would like to know the impact of a full cluster of complementary HR practices (see, e.g., Aral et al., 2012; Ichniowski et al., 1997, for different methods on how to bundle specific practices together). The logit regressions presented in Table A3 in the Appendix suggest that the implementation of a performance evaluation system at the establishment level comes along with other HR practices that likely influence career prospects, such as target agreements, employee interviews and personnel development plans.

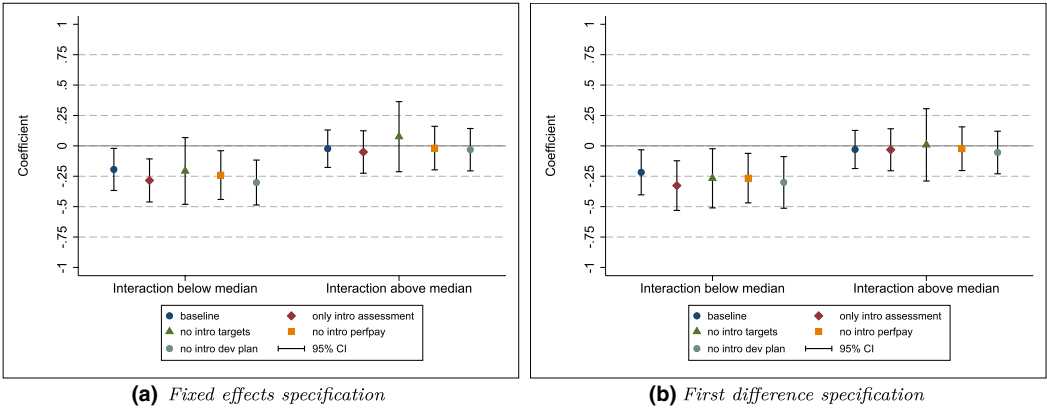
To study the impact of clusters of HR practices, we estimate different specifications which are implementable with our sample size and exploit information from questions that explicitly ask whether there have been changes—including an introduction—with respect to the HR instruments performance evaluations, target agreements and performance pay in the last 2 years. First, we make use of a survey question which asks establishments whether the indicated changes in the performance evaluation system were exclusive to the area of employee assessment or whether these changes occurred in combination with changes in other areas. The area of employee assessment may also contain changes in the usage of target agreements. Nearly 58% of the establishments that introduce a performance evaluation system indicate that this change only affects the field of employee assessment. In the first specification, we only concentrate on treated employees of these establishments. In the next specifications, we consider only the introduction of a performance evaluation system that is not accompanied by the introduction of target agreements (45% of the treated establishments) or by the introduction of a performance pay scheme (88% of the treated establishments). Finally, we look at the introduction of performance evaluations that does not come along with an introduction of personnel development plans (74% of the treated establishments).<sup>19</sup> Figure 3 shows that the estimated effects in these four specifications are comparable to the baseline specification. In sum, the analyses in this subsection show that the introduction of performance evaluations has a direct impact on the turnover intentions of employees irrespective of whether evaluations are implemented within a broader set of HR practices or not.

## Group-specific results

In this subsection, we turn to the quantitative and qualitative discussion of the differences in the estimated coefficients between below- and above-median paid employees. Our main focus is on the specification with all control variables included (last specification from the left of Figure 2). The full set of coefficients is shown in Table A6 in the Appendix. The results suggest that employees with a conditional relative rank position below the median reduce their turnover intentions significantly by around 0.2 points on a 1 to 5 scale when performance evaluations are implemented in the establishment. This effect corresponds to a quarter of the overall standard deviation or 13% of the mean value of turnover intentions (see Table 1). In contrast, the effect on the turnover intentions of employees with a conditional relative rank position above the median is zero, suggesting that the implementation of performance evaluations has no impact for this group of employees.

<sup>18</sup>The results are not shown in the paper but are available on request.

<sup>19</sup>Please note that the introduction of personnel development plans is not directly asked in the survey and we only rely on information of establishments that indicate not making use of personnel development plans in one period and making use of it in the next period.



**FIGURE 3** Effect of performance evaluations on turnover intentions by median of relative pay and the introduction of complementary HR practices. Panel (a): Fixed effects specification; panel (b): First difference specification; outcome: Turnover intentions (1–5 scale); plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level; covariates of baseline model: Baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE; covariates of model “only introduction employee assessment”: Baseline covariates, individual perfpay and year-FE; covariates of model “no introduction target agreements”: Same as baseline model; covariates of model “no introduction performance pay”: Same as baseline model excluding intro perfpay; covariates of model “no introduction personnel development plans”: Same as baseline model excluding personnel development plans.  $N = 5102\text{--}5403$  (panel a) and  $1579\text{--}1809$  (panel b). Source: LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

The impact of performance evaluations is expected to be more pronounced if the potential gains from an internal labor market are higher. Therefore, we estimate the treatment effects for different establishment sizes as large establishments might offer more scope for career development. The results presented in Figure A5 in the Appendix suggest that the negative effect on turnover intentions for relatively low-paid employees is indeed driven by large establishments: Individuals with a conditional relative rank position below the median reduce their turnover intentions by 0.4 points if performance evaluations are implemented. For above-median paid employees, we document zero effects independent of establishment size.

In another specification, we additionally control for percentiles of the actual wage level of the employee and the dispersion of wages within establishments as a larger variance in wages might offer more scope for potential wage increases. However, the results in Figure A6 in the Appendix show that the estimated coefficients do not change compared to the baseline specification.

Finally, Figure A7 in the Appendix shows the results by job level. The second level comprises jobs which require a secondary level vocational education (e.g., apprenticeship training), and the third and fourth levels are usually staffed with persons who hold a tertiary degree and are qualified to take management responsibilities. Our prior would be that employees working in jobs at the second level face more information asymmetries in the sense that they are less well informed about their relative rank position than employees of higher job levels and the effect of performance evaluations might hence be more pronounced for the former group. The results presented in Figure A7 confirm that the negative effects for relatively low paid are driven by employees of job level 2.

In sum, we see that the introduction of performance evaluations has a negative impact on the turnover intentions of relatively low-paid and no impact on relatively high-paid employees. Two considerations might explain the finding that employees who are paid below the median reduce their turnover intentions: First, they may reduce their overall career aspirations because they see lower chances to benefit from internal or external movements. This reasoning is supported by recent findings of Jäger et al. (2021). The authors compare workers' subjective outside options against objective measures of pay premia from matched employer–employee data and document that many workers mistakenly believe their current wage is representative of the external labor market. Hence, their results suggest that objectively low-paid (high-paid) workers are overpessimistic (overoptimistic) about their outside options. Second, comparatively low-paid employees could have an incentive to stay and to invest in their human capital to increase future career options. As performance evaluations are often accompanied by a discussion on prospects of career development, it is not unlikely that a supervisor offers such options.

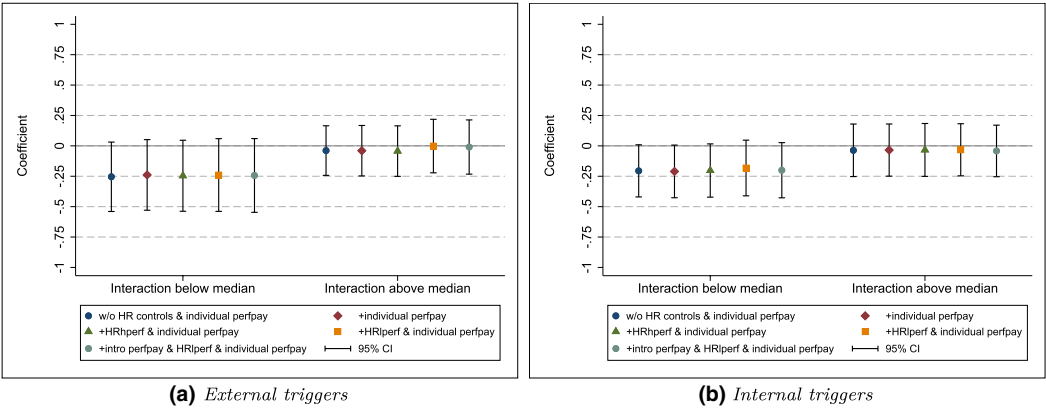
Table A9 in the Appendix further suggests that turnover intentions in the pre-treatment period are exceptionally high among below-median paid employees in establishments where performance evaluations are introduced in the future compared to individuals in establishments where performance evaluations have already been introduced or will never be introduced. The differences are less pronounced for above-median paid employees. After the implementation of performance evaluations, below-median paid employees reach a comparable level of turnover intentions as individuals in establishments that have already or do not introduce such a system.

## Different triggers for implementing performance evaluations

Firms implement individual performance evaluation systems for different reasons, which may be more or less related to actual firm performance and employee turnover intentions. For example, establishments facing internal problems might implement a performance evaluation system with the explicit intention to reduce employee turnover, while other firms do not. The employer survey also contains information on the triggers for introducing a performance evaluation system. Table A7 in the Appendix shows the responses, classified as external and internal triggers. We classify triggers as external in case they relate to innovations or external requirements and as internal in case they relate to internal experiences or problems. However, we do not make the claim here that concentrating on external triggers eliminates necessarily endogeneity bias, as innovations might to some degree be related to firm productivity and the establishments may endogenously decide not to introduce performance evaluations.

The figures show that the most often mentioned trigger is new ideas of the management team, which was true in 54% of cases. Almost 14% mention external experience and less than 10% mention other external triggers such as external requirements (e.g., set by collective agreements or the parent company) or new technologies (e.g., new IT solutions). Turning to internal triggers for the introduction of performance evaluations, 28% of the establishments indicate that they already gained positive internal experience with performance evaluations, also 28% state internal problems (e.g., due to the economic situation or employee dissatisfaction), 14% that expectations have not been met and 10% state it was at the advice of a consultant.

To analyze whether triggers for the introduction might be a potential driver of the results, we study the effects separately for those individuals who work in establishments where performance evaluations are introduced due to external and internal triggers, respectively. Figure 4 shows that the effects are the same for both types of triggers: relatively low-paid employees



**FIGURE 4** Effect of performance evaluations on turnover intentions by median of relative pay and triggers for implementing performance evaluations. First difference specification; outcome: Turnover intentions (1–5 scale); plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level for external triggers for implementing performance evaluations (panel a) and for internal triggers (panel b); external triggers comprise “new ideas of the management”, “external experience”, “external requirement”, “new technology” and internal triggers “positive internal experience”, “expectations have not been met”, “internal problems” and “advice of consultant”; baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE.  $N = 1609$ – $1656$  (panel a) and  $1619$ – $1666$  (panel b). Source: LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

reduce their turnover intentions significantly and for relatively high paid we do not find a significant effect.

### The role of affective behavior

So far, we have seen that performance evaluations have a negative impact on the turnover intentions of below-median paid employees and that the simultaneous implementation of measures to support employees is likely. Next, we investigate potential channels for this relationship. In the following, we analyze the impact of implementing performance evaluations on employee perceptions of supervisors, organizational support, and fairness. Beside the content of the evaluation and the resulting emotions, the 1-to-1 meeting and the individualized attention of the supervisor might improve the relationship and perceptions of the manager and encourage individuals to stay in the establishment.<sup>20</sup>

Therefore, we consider in the following analyses overall job satisfaction, perceptions of fairness and management quality as well as the evaluation of the promotion criteria in the establishment. The results in Table 2 (panel A) suggest that individuals do not change their view of being disadvantaged in a personnel decision when performance evaluations are implemented. We find weak evidence that above-median paid employees (weakly significant at the 10% level) are more likely to feel supported by the management. However, we document a substantial increase by 0.27 points of a standard deviation in the job satisfaction of below-median paid employees.

<sup>20</sup>See the organizational psychology literature on the importance of 1-to-1 meetings (e.g., Castro et al., 2022; Kim, 2020).



**TABLE 2** Channels.

	Below median	Above median
Panel A: Effect of performance evaluations (FE specification) on		
Job satisfaction	0.270**	0.098
Perception of		
Being disadvantaged in personnel decision	−0.081	−0.016
Being supported by management	0.022	0.176*
Promotion criteria being based on		
Expected skill-fit for new position	−0.163	0.110
Expected skill-fit of old position	−0.053	0.133
Non-objective criteria	−0.328**	0.012
Panel B: Effect of performance evaluations (FD specification) on		
Job satisfaction	0.303**	0.060
Perception of		
Being disadvantaged in personnel decision	−0.095	−0.019
Being supported by management	−0.017	0.148
Promotion criteria being based on		
Expected skill-fit for new position	−0.271*	0.090
Expected skill-fit of old position	0.022	0.137
Non-objective criteria	−0.427***	−0.01

*Note:* Panel (A): Fixed effects (FE) specification; panel (B): First difference (FD) specification; each row represents the regression output of the respective outcome variable; outcome variables are standardized; covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared), variable pay, employee interviews, personnel development plans, open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors, performance pay, year-FE.  $N = 5243$ – $5483$  (panel A) and  $N = 1747$ – $1837$  (panel B).

\*\*\*/\*\*/\*Significant at the 1/5/10% level.

*Source:* LPP-ADIAB 7519, own computations.

In a next step, we assess the impact of performance evaluations on the employee's evaluation of promotion criteria. Interestingly, employees paid above the median do not change their view. Instead, we observe a significant decrease in the assessment that promotion decisions are based on non-objective criteria among the below-median paid employees. This finding is in line with the evidence that for establishments that introduce performance evaluations target agreements and personnel development plans play a significantly larger role. In particular, the introduction of personnel development plans could be more relevant for comparatively low-paid employees and coincide with a structured and objective way of defining promotion criteria.

Table A8 in the Appendix shows further analyses of affective behavior. Additional outcome variables include perceptions of fairness and treatments shown by the supervisors of the establishment but also on clarity and goal communication by the management. Although some coefficients are large and positive for both below- and above-median paid employees (e.g., on the perception of supervisors showing trust towards employees, good guidance of supervisors), we do not find any significant relationship.

This result leads us to the conclusion that the introduction of performance evaluations matters for the turnover intentions of employees and part of the impact is explained by fairness perceptions regarding career opportunities, which is in line with the POS literature. However, we do not find strong evidence on a positive impact on the perception of

supervisor and management quality which goes beyond the career planning of the individual employee.

## Actual job search and employer switches

Besides information on turnover intentions, the LPP also includes information on actual job search.<sup>21</sup> In our sample, 10% are actively looking for a new job. Figure A8 in the Appendix shows the effects of performance evaluations on the incidence of searching for a new job in dependence of the relative performance of the employees. In line with the results for turnover intentions, employees paid below the median decrease their job search activities significantly by around 5% points when performance evaluations are introduced, whereas higher paid employees do not change their job search behavior.

In a last step, we look at the effects of the introduction of performance evaluations on actually observed employer switches in the social security data. We are able to follow individuals up to the end of the year 2019 and examine whether or not individuals change their employer in the last observed year and the following year of the survey wave. These are very rare events: we only observe a change for 2% of the sample. Figure A9 in the Appendix shows the results for below- and above-median paid employees. The fixed effects specification in panel (a) suggests that for relatively low paid the probability to switch the employer is slightly reduced but the effects are not significant and for relatively high paid the effect is close to zero. The effects are more positive but still insignificant when looking at the first difference specification (panel (b)).<sup>22</sup>

## CONCLUSION

In this article, we study the effects of the implementation of performance evaluations at the establishment level on employees' turnover intentions. We document that establishments that introduce performance evaluation systems are comparable to other firms with respect to most dimensions, such as firm size, sector composition, wage premia, performance pay systems, support in decision making or promotion criteria. However, we also find that establishments that have a problem with relatively high turnover among those paid below the median are more likely to introduce performance evaluations and other forms of employee involvement and development.

In our empirical analysis, we study the effects of the overall management strategy to implement a performance evaluation system while controlling for many other changes in employment conditions at the establishment and employee level. Our findings suggest that the implementation of performance evaluations has heterogeneous effects on workers' intentions to leave depending on their relative rank. Employees paid below the median significantly decrease their turnover intentions and are more satisfied with their job, whereas employees paid above the median do not change their turnover intentions. The same pattern in heterogeneities is confirmed when looking at other outcomes of job search behavior such as actual job search and employer switches. Moreover, we find that relatively low paid are more satisfied with their

<sup>21</sup>We use a measure of actual job search based on the question "Have you been actively looking for another job during the last 12 months or have you been approached by another employer?" and the answers: 1 "yes, I have been actively searching", 2 "yes, I have been approached by another employer", 3 "both is true" and 4 "no, neither". We generate a dummy variable which equals one for categories 1 to 3 and zero for category 4.

<sup>22</sup>We observe a similar pattern when we look at employer switches conditional on surviving, i.e. we only study the effects for individuals in waves where no employer switching has occurred in previous waves. The results are shown in Figure A10 in the Appendix.

job and perceive promotion criteria as more objective after the introduction of performance evaluations.

Our study delivers useful insights about the impact of performance evaluations which might be helpful for the design of management strategies to retain workers. Our findings suggest that firms that introduce a performance evaluation system are successful in retaining a specific group of individuals who do not belong to the top-performers and might be unsure about their future development options within the firm. Performance evaluations might therefore be a good tool that not only provides performance incentives to employees but also provides credible information about individually tailored career paths; consequently keeping employees from pursuing their chances elsewhere. This could be an efficient strategy against the background of skilled-worker shortages and large hiring costs. Nevertheless, retaining relatively low performers could also change the composition of the work force and have a negative impact on the productivity of the firm in the long-run. The consequences for firm-level outcomes would be an interesting direction for future research.

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## CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

## DATA AVAILABILITY STATEMENT

This paper uses survey and administrative data from the IAB Research Data Center (FDZ), see <https://fdz.iab.de/en/our-data-products/integrated-establishment-and-individual-data/lpp/>. Since data access is restricted by the laws of the German Social Code, the data is not freely available to the research community. Members of the research community can apply for and access data products at the FDZ. Access can take place, e.g., via on-site use or via remote data access. More detailed information can be found here: <https://fdz.iab.de/en/data-access/>.

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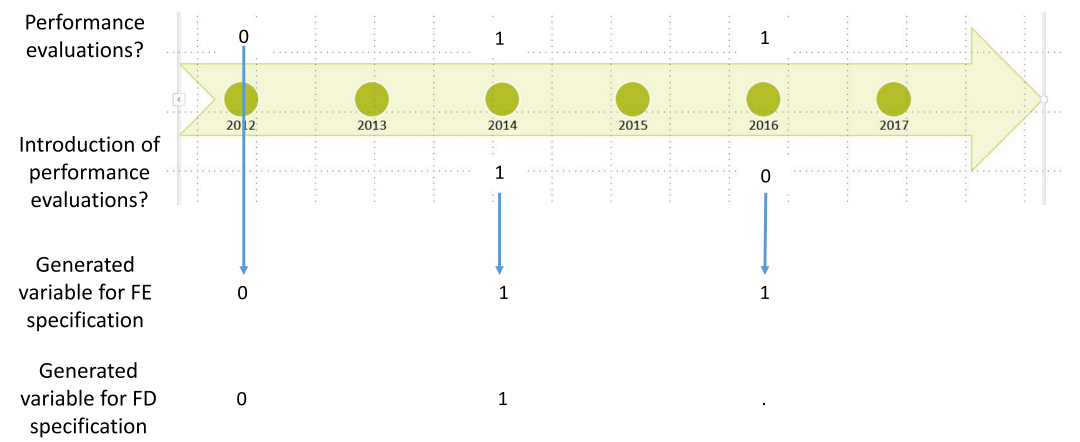
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APPENDIX A.1

TREATMENT DEFINITION



**FIGURE A1** Definition of performance evaluations. FD, First difference; FE, Fixed effects. *Source:* Own presentation. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.com)]

APPENDIX A.2

FURTHER DESCRIPTIVE STATISTICS AND EMPIRICAL RESULTS

TABLE A1 Descriptive statistics of establishments by treatment.

	Performance evaluations							
	Always		Never		Implementation in future		<i>p</i> -value	<i>p</i> -value
	<i>N</i>	Mean	<i>N</i>	Mean	<i>N</i>	Mean		
		(1)		(2)		(3)	(1) – (3)	(2) – (3)
Firm size: 50–99 employees	592	0.340	337	0.457	72	0.319	0.734	0.033
Firm size: 100–249 employees	592	0.306	337	0.335	72	0.319	0.812	0.796
Firm size: 250–499 employees	592	0.203	337	0.128	72	0.264	0.229	0.003
Firm size: ≥500 employees	592	0.152	337	0.080	72	0.097	0.214	0.634
Agriculture, mining, energy	577	0.023	327	0.018	69	0.029	0.737	0.569
Manufacturing	577	0.504	327	0.535	69	0.551	0.467	0.814
Construction	577	0.045	327	0.052	69	0.043	0.952	0.770
Wholesale, retail trade	577	0.107	327	0.101	69	0.072	0.368	0.467
Transport and storage	577	0.068	327	0.052	69	0.087	0.551	0.260
Accomodation and food services	577	0.016	327	0.009	69	0.014	0.944	0.689
Information and communication	577	0.009	327	0.012	69	0.043	0.013	0.074
Other high-skilled services	577	0.184	327	0.153	69	0.145	0.428	0.867
Education, health, social work	577	0.045	327	0.067	69	0.014	0.231	0.089
AKM establishment FE <sup>a</sup>	583	0.342	335	0.291	72	0.324	0.455	0.201
Performance evaluations	592	1.000	337	0.000	72	0.000	0.000	0.000
Target agreements	498	0.753	283	0.438	64	0.281	0.000	0.021
Performance pay	591	0.677	337	0.407	72	0.597	0.176	0.003
Collective agreement	592	0.652	336	0.554	72	0.583	0.251	0.645
Employee interviews	592	0.885	337	0.424	72	0.778	0.010	0.000
Employee survey	592	0.507	337	0.264	72	0.486	0.741	0.000
Personnel development plans	592	0.608	337	0.255	72	0.583	0.685	0.000
Importance of employee retention <sup>b</sup>	591	3.721	336	3.411	72	3.833	0.336	0.001
Change in ownership	588	0.071	335	0.063	72	0.097	0.431	0.295
Change in executive board	590	0.227	335	0.176	72	0.264	0.485	0.086
Decision support: management consultant	478	0.471	282	0.351	62	0.403	0.317	0.440
Decision support: competition	478	0.421	282	0.344	62	0.387	0.616	0.521
Decision support: association information	478	0.603	282	0.543	62	0.629	0.688	0.216
Decision support: none	478	0.167	282	0.248	62	0.161	0.904	0.143
Personnel management in the board of directors	588	0.447	333	0.483	72	0.458	0.859	0.699
Promoting women in management positions	590	0.322	336	0.193	72	0.361	0.505	0.002

(Continues)



TABLE A1 (Continued)

	Performance evaluations							
					Implementation in future		<i>p</i> -value	<i>p</i> -value
	Always		Never					
	<i>N</i>	Mean	<i>N</i>	Mean	<i>N</i>	Mean		
		(1)		(2)		(3)	(1) – (3)	(2) – (3)
Open discussion with low performers <sup>b</sup>	591	4.333	336	4.116	72	4.306	0.811	0.170
Personnel development of low performers <sup>b</sup>	590	3.629	336	2.911	72	3.639	0.945	0.000
Change position of low performer <sup>b</sup>	590	2.985	336	2.589	72	3.056	0.645	0.004
Dismissal of low performers <sup>b</sup>	591	3.294	336	3.366	72	3.500	0.228	0.458
Investment in higher qualifications	592	0.696	337	0.558	72	0.764	0.234	0.001
Promotion criteria: professional competence <sup>b</sup>	477	1.415	271	1.339	60	1.417	0.987	0.438
Promotion criteria: personal competence <sup>b</sup>	476	1.908	272	2.184	60	1.883	0.819	0.021
Promotion criteria: ethic values <sup>b</sup>	473	3.670	271	3.867	60	3.800	0.283	0.626
Promotion criteria: tenure <sup>b</sup>	472	4.564	271	4.255	61	4.541	0.838	0.039

Note: Descriptive statistics are based on the first observation in the sample.

<sup>a</sup> Measured in logs and on a scale from –0.627 to 0.798.

<sup>b</sup> Measured on a scale from 1 to 5.

All other variables are dummy variables.

Source: LPP-ADIAB 7519, own computations.

TABLE A2 Descriptive statistics of treated establishments.

	Implementation of performance evaluations				
	Before		After		p-value (1) – (2)
	N	Mean	N	Mean	
		(1)		(2)	
Performance evaluations	72	0.000	72	1.000	0.000
Target agreements	64	0.328	64	0.859	0.000
Performance pay	72	0.625	72	0.736	0.155
Collective agreement	72	0.583	72	0.583	1.000
Employee interviews	72	0.792	72	0.931	0.016
Employee survey	72	0.472	72	0.556	0.321
Personnel development plans	72	0.556	72	0.736	0.023
Importance of employee retention	72	3.861	72	3.903	0.785
Change in ownership	72	0.097	72	0.097	1.000
Change in executive board	72	0.250	72	0.333	0.275
Decision support: management consultant	32	0.469	32	0.656	0.135
Decision support: competition	32	0.500	32	0.625	0.321
Decision support: association information	32	0.625	32	0.688	0.605

TABLE A2 (Continued)

	Implementation of performance evaluations				
	Before		After		<i>p</i> -value
	<i>N</i>	Mean	<i>N</i>	Mean	
		(1)		(2)	(1) – (2)
Decision support: none	32	0.188	32	0.063	0.135
Personnel management in the board of directors	72	0.486	72	0.403	0.318
Promoting women in management positions	72	0.375	72	0.278	0.216
Open discussion with low performers	72	4.333	72	4.403	0.619
Personnel development of low performers	72	3.653	72	3.778	0.495
Change position of low performers	72	2.972	72	2.875	0.637
Dismissal of low performers	72	3.556	72	3.222	0.122
Investment in higher qualifications	72	0.750	72	0.806	0.426
Promotion criteria: professional competence	30	1.500	30	1.500	1.000
Promotion criteria: personal competence	30	1.867	30	1.933	0.781
Promotion criteria: ethic values	29	3.655	29	3.448	0.416
Promotion criteria: tenure	30	4.633	30	4.700	0.718

Source: LPP-ADIAB 7519, own computations.

TABLE A3 Selection of establishments into introduction of performance evaluations in *t* + 1.

	(1)	(2)	(3)
Firm size: 100–249 employees	–0.001 (0.021)	–0.015 (0.021)	–0.016 (0.020)
Firm size: 250–499 employees	0.029 (0.023)	0.042* (0.024)	0.045* (0.024)
Firm size: ≥500 employees	–0.002 (0.030)	–0.006 (0.032)	0.002 (0.029)
AKM establishment FE	–0.014 (0.047)	0.043 (0.045)	0.067 (0.041)
Performance pay	0.002 (0.018)	–0.009 (0.018)	–0.003 (0.016)
Target agreements		–0.111*** (0.021)	–0.014 (0.022)
Collective agreement	–0.013 (0.017)	–0.019 (0.018)	–0.011 (0.018)
Employee interviews	0.001 (0.019)	0.025 (0.021)	0.043 (0.035)
Employee survey	0.001 (0.016)	–0.006 (0.017)	–0.007 (0.018)
Personnel development plans	–0.007 (0.018)	0.002 (0.018)	0.023 (0.023)
Importance of employee retention	0.012 (0.010)	0.014 (0.012)	0.002 (0.009)

(Continues)

TABLE A3 (Continued)

	(1)	(2)	(3)
Change in ownership	0.008 (0.032)	0.006 (0.038)	0.003 (0.040)
Change in executive board	-0.000 (0.021)	-0.007 (0.021)	-0.013 (0.017)
Personnel management in the board of directors	0.014 (0.017)	0.020 (0.018)	0.021 (0.016)
Promoting women in management positions	0.033* (0.018)	0.019 (0.018)	0.005 (0.015)
Open discussion with low performers	-0.001 (0.009)	0.007 (0.009)	0.005 (0.010)
Personnel development of low performers	0.001 (0.008)	0.004 (0.007)	-0.002 (0.008)
Change position of low performers	-0.001 (0.007)	-0.003 (0.007)	-0.013* (0.007)
Dismissal of low performers	0.008 (0.006)	0.007 (0.006)	0.004 (0.007)
Investment in higher qualifications	0.019 (0.019)	0.011 (0.018)	0.008 (0.023)
Introduction performance pay in $t+1$			0.051 (0.038)
Introduction target agreements in $t+1$			0.140*** (0.022)
Introduction employee interviews in $t+1$			0.070** (0.033)
Introduction employee survey in $t+1$			0.034* (0.018)
Introduction personnel development plans in $t+1$			0.046** (0.023)
Introduction open discussion with low performers in $t+1$			0.003 (0.023)
Introduction personnel development of low performers in $t+1$			0.007 (0.019)
Introduction change position of low performers in $t+1$			-0.040** (0.019)
Introduction dismissal of low performers in $t+1$			-0.001 (0.019)
Introduction investment in higher qualifications in $t+1$			-0.001 (0.031)
Observations	995	852	846
Pseudo $R$ -squared	0.143	0.290	0.477

Note: The table shows marginal effects from logit regressions of the probability to implement performance evaluations in  $t+1$  at the establishment level. The specification further includes year fixed effects.

\*\*\*/\*\*/\* significant at the 1/5/10% level.

Source: LPP-ADIAB 7519, own computations.

**TABLE A4** Further descriptive statistics of individuals.

	Mean	SD			Min	Max
		Overall	Between	Within		
HR control variables						
Employee interviews	0.806	0.395	0.351	0.200	0	1
Personnel development plans	0.632	0.482	0.427	0.233	0	1
HR control variables—extended						
Open discussion with low performers	4.287	0.871	0.709	0.543	1	5
Personnel development of low performers	3.650	1.100	0.916	0.643	1	5
Change position of low performers	3.087	1.185	0.942	0.756	1	5
Dismissal of low performers	3.154	1.334	1.102	0.787	1	5
Investment in higher qualifications	0.802	0.399	0.332	0.226	0	1
Employee survey	0.512	0.500	0.447	0.239	0	1
Promoting women in management positions	0.409	0.492	0.424	0.261	0	1
Change in executive board	0.286	0.452	0.339	0.320	0	1
Personnel management in the board of directors	0.419	0.494	0.423	0.268	0	1
Performance pay	0.704	0.457	0.444	0.097	0	1
Wage measures						
Wage pct 0-5	0.052	0.222	0.214	0.076	0	1
Wage pct 5-25	0.213	0.409	0.390	0.145	0	1
Wage pct 25-50	0.286	0.452	0.415	0.196	0	1
Wage pct 50-75	0.268	0.443	0.398	0.206	0	1
Wage pct 75-95	0.161	0.367	0.324	0.167	0	1
Wage pct >95	0.021	0.142	0.112	0.093	0	1
Difference establishment wage max – pct 75	46.068	31.321	31.166	4.561	0	142
Difference establishment wage pct 75 – pct 50	22.895	12.493	12.235	2.466	0	74
Difference establishment wage pct 50 – pct 25	16.808	10.577	10.387	2.066	0	63
Difference establishment wage pct 25 – min	63.790	31.960	30.981	8.366	3	169

*Note:* *N* = 5403.  
Abbreviations: pct, percentile; SD, standard deviation.  
*Source:* LPP-ADIAB 7519, own computations.

**TABLE A5** Descriptive statistics of individuals by treatment.

	Implementation of performance evaluations in future		
	No	Yes	<i>p</i> -value
	(1)	(2)	(1) – (2)
Outcomes			
Turnover intentions	1.488	1.547	0.371
Turnover intentions (dummy)	0.339	0.373	0.386
Relative wage rank			
Below median	0.456	0.478	0.586
Above median	0.544	0.522	0.586
Baseline control variables			
Female	0.259	0.211	0.178
Qualificational level:			
None	0.012	0.006	0.492
Apprenticeship	0.593	0.572	0.616
Advanced apprenticeship	0.243	0.245	0.952
University/UAS	0.152	0.176	0.412
Partner	0.863	0.907	0.115
Number of children	0.415	0.484	0.274
Age <30	0.055	0.068	0.493
Age 30–39	0.142	0.161	0.493
Age 40–49	0.372	0.447	0.058
Age ≥50	0.431	0.323	0.008
Leadership position	0.303	0.280	0.527
Job strain	3.586	3.534	0.590
Working hours	39.976	39.939	0.955
Job autonomy	4.056	4.056	0.995
Multitasking	4.236	4.180	0.455
Establishment size	542.909	923.255	0.007
Individual performance pay			
Variable pay	0.606	0.758	0.000
HR control variables			
Employee interviews	0.814	0.901	0.006
Personnel development plans	0.650	0.702	0.182
HR control variables—extended			
Open discussion with low performers	4.230	4.373	0.054
Personnel development of low performers	3.570	3.460	0.224
Change position of low performers	3.074	3.081	0.945
Dismissal of low performers	3.150	3.099	0.638
Investment in higher qualifications	0.812	0.894	0.009
Employee survey	0.493	0.640	0.000

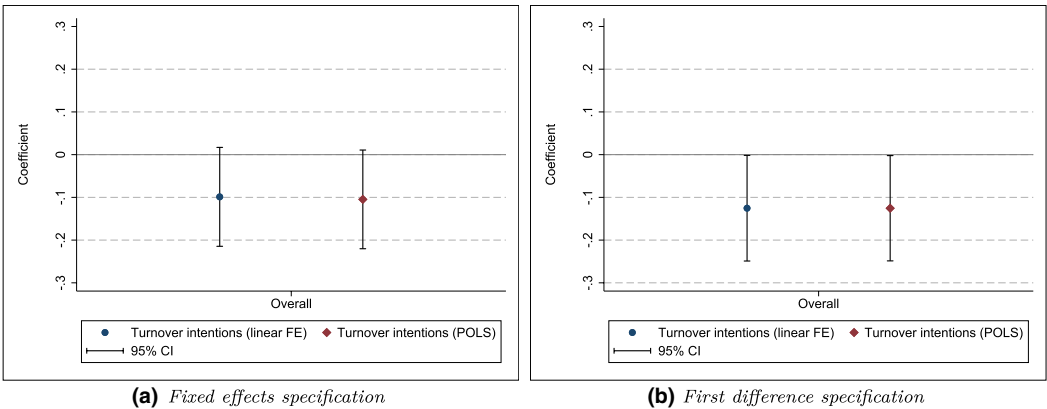
TABLE A5 (Continued)

	Implementation of performance evaluations in future		
	No	Yes	<i>p</i> -value
	(1)	(2)	(1) – (2)
Promoting women in management positions	0.406	0.491	0.035
Change in executive board	0.270	0.311	0.269
Personnel management in the board of directors	0.437	0.447	0.810
Performance pay	0.698	0.671	0.467
Wage measures	0.066	0.043	0.264
Wage pct 0–5			
Wage pct 5–25	0.221	0.292	0.038
Wage pct 25–50	0.317	0.217	0.009
Wage pct 50–75	0.252	0.342	0.012
Wage pct 75–95	0.129	0.093	0.183
Wage pct >95	0.015	0.012	0.808
Difference establishment wage max – pct 75	45.527	38.574	0.005
Difference establishment wage pct 75 – pct 50	21.945	20.454	0.129
Difference establishment wage pct 50 – pct 25	16.009	14.600	0.088
Difference establishment wage pct 25 – min	61.529	67.923	0.012
Number of individuals	2094	161	

Note: Descriptive statistics are based on the first observation of individuals in the sample.

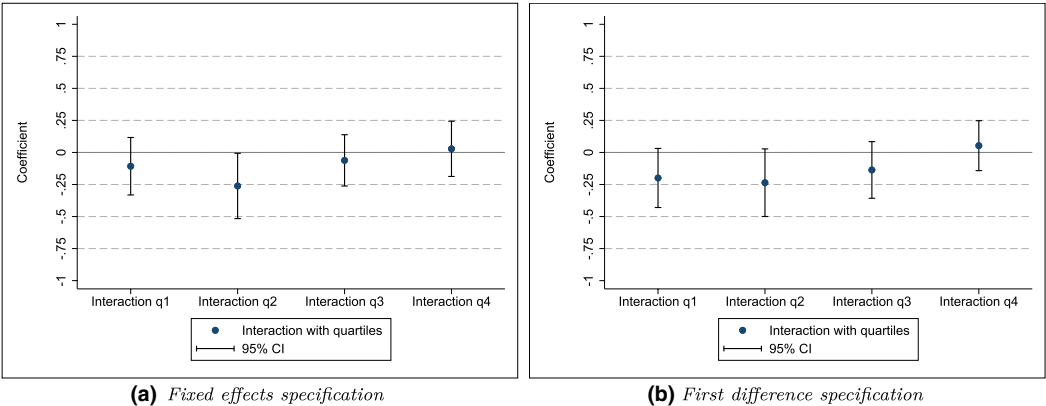
Abbreviations: pct, percentile; UAS, university of applied science.

Source: LPP-ADIAB 7519, own computations.



**FIGURE A2** Overall effect of performance evaluations on turnover intentions, different model specifications. Estimations from linear regression and probit-adapted ordinary least squares (POLS); panel (a): Fixed effects specification; panel (b): First difference specification; outcomes: Turnover intentions (1–5 scale); plotted coefficients: Effect of performance evaluations on the establishment level; covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared), variable pay, year-FE.  $N=5491$  (panel a) and 1854 (panel b). Source: LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]





**FIGURE A3** Effect of performance evaluations on turnover intentions by quartiles of relative pay. Panel (a): Fixed effects specification; panel (b): First difference specification; outcomes: Turnover intentions (1–5 scale) and indicator for turnover intentions; plotted coefficients: Interactions between quartile of conditional relative rank position and performance evaluations on the establishment level; covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared), variable pay, year-FE.  $N=5436$  (panel a) and 1841 (panel b). Source: LPP-ADIAAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

**TABLE A6** Baseline specification: Effect of performance evaluations on turnover intentions divided by median of relative pay.

	(1)	(2)
	FE specification	FD specification
PE interacted paid below median	−0.194** (0.088)	−0.218** (0.094)
PE interacted paid above median	−0.023 (0.079)	−0.030 (0.080)
Baseline covariates		
Partner	−0.051 (0.077)	−0.146 (0.136)
Number of children	0.012 (0.028)	0.011 (0.047)
Age 30–39	0.069 (0.134)	0.081 (0.201)
Age 40–49	0.194 (0.159)	0.237 (0.245)
Age ≥50	0.234 (0.167)	0.301 (0.262)
Leadership position	−0.003 (0.049)	−0.007 (0.101)
Job strain	0.021 (0.013)	0.069*** (0.023)
Working hours	−0.006 (0.008)	−0.021 (0.015)
Working hours squared	0.000 (0.000)	0.000 (0.000)
Job autonomy	−0.071*** (0.016)	−0.052** (0.026)
Multitasking	0.003 (0.017)	0.012 (0.033)
Establishment size	−0.000 (0.000)	−0.001* (0.001)
Establishment size squared	0.000 (0.000)	0.000* (0.000)
Additional covariates		
Variable pay	−0.084*** (0.029)	−0.150*** (0.056)
Employee interviews	−0.011 (0.039)	−0.100** (0.049)
Personnel development plans	0.009 (0.034)	0.054 (0.055)

(Continues)

TABLE A6 (Continued)

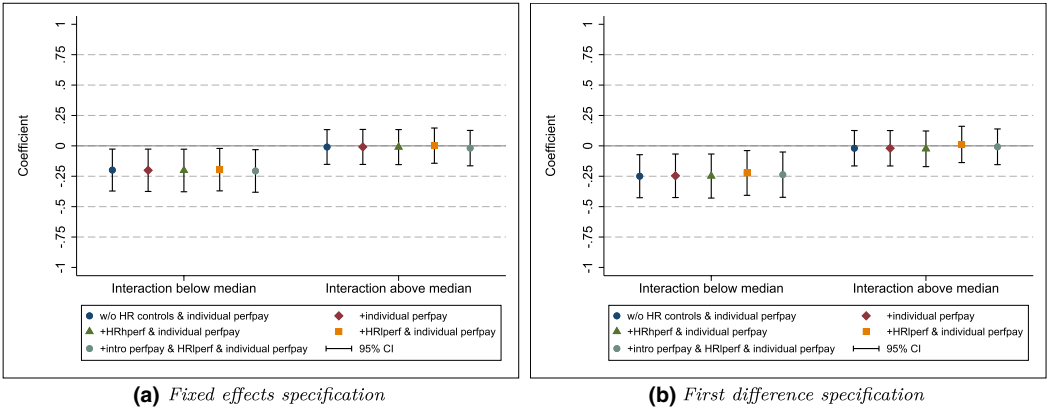
	(1)	(2)
	FE specification	FD specification
Open discussion with low performers	0.007 (0.013)	0.002 (0.022)
Personnel development of low performers	0.005 (0.013)	−0.005 (0.020)
Change position of low performers	−0.006 (0.011)	−0.001 (0.019)
Dismissal of low performers	−0.006 (0.010)	−0.019 (0.017)
Investment in higher qualifications	0.004 (0.035)	0.105 (0.068)
Employee survey	−0.027 (0.035)	0.108 (0.068)
Promoting women in management positions	0.034 (0.028)	0.107* (0.057)
Change in executive board	0.013 (0.023)	0.019 (0.040)
Personnel management in the board of directors	0.025 (0.026)	0.001 (0.047)
Performance pay	0.113 (0.078)	0.149 (0.125)
Year 2014	−0.033 (0.022)	−0.051 (0.039)
Year 2016	−0.047 (0.031)	−0.085 (0.059)
Year 2018	−0.088** (0.042)	−0.199*** (0.068)
Constant	1.963*** (0.316)	2.284*** (0.552)
Number of observations	5403	1809
R-squared	0.019	0.059

Note: Outcome: turnover intentions (1–5 scale).

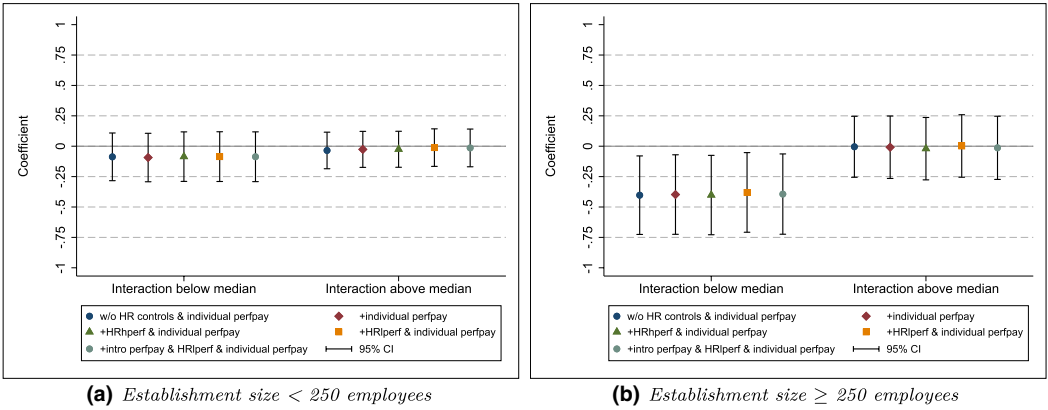
Abbreviations: FD, first difference; FE, fixed effects; PE, performance evaluations.

\*\*\*/\*\*/\* significant at the 1/5/10% level.

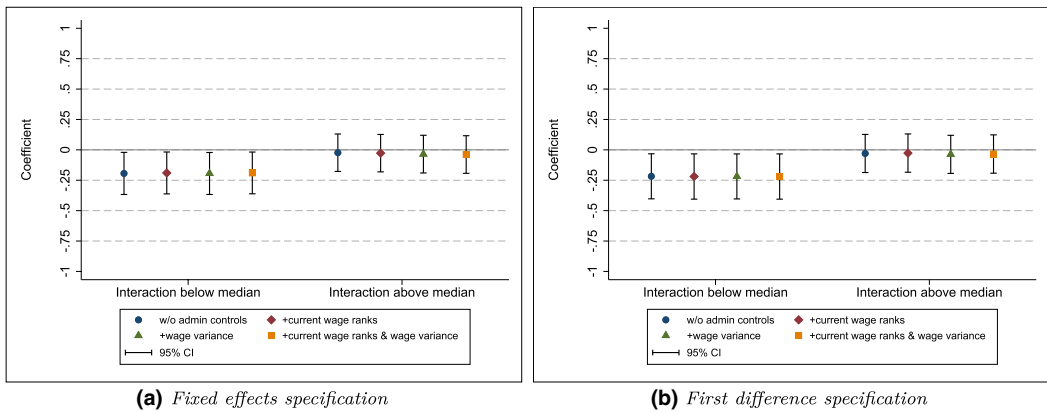
Source: LPP-ADIAB 7519, own computations.



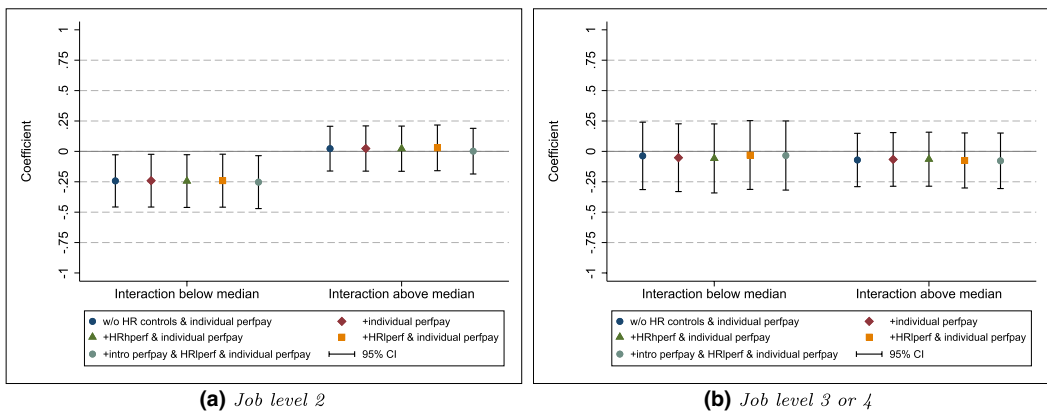
**FIGURE A4** Effect of performance evaluations on turnover intentions by median of relative pay, different handling of individuals earning wages above the ceiling of the social security contributions. Exclusion of establishment-occupation-job level cells if more than 50% of the individuals in the cell have predicted wages above the ceiling of the social security contributions. Panel (a): Fixed effects specification; panel (b): First difference specification; outcome: Turnover intentions (1–5 scale); plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level; baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perpay: Performance pay; year-FE; wage ranks: Percentiles of the actual wage level; wage variance: Difference of quartiles of the wage distribution within establishments.  $N=5332\text{--}5428$  (panel a) and  $1760\text{--}1808$  (panel b). *Source:* LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



**FIGURE A5** Effect of performance evaluations on turnover intentions by median of relative pay and establishment size. Fixed effect specification; outcome: Turnover intentions (1–5 scale); plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level for establishment size  $<250$  employees (panel a) and establishment sizes  $\geq 250$  employees (panel b); baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perpay: Performance pay; year-FE.  $N=2880\text{--}2927$  (panel a) and  $2523\text{--}2573$  (panel b). *Source:* LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



**FIGURE A6** Effect of performance evaluations on turnover intentions by median of relative pay, controlling for administrative wage information. Panel (a): Fixed effects specification; panel (b): First difference specification; outcome: Turnover intentions (1–5 scale); plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level; baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE; wage ranks: Percentiles of the actual wage level; wage variance: Difference of quartiles of the wage distribution within establishments.  $N=5403$ – $5500$  (panel a) and  $1809$ – $1857$  (panel b). *Source:* LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



**FIGURE A7** Effect of performance evaluations on turnover intentions by median of relative pay and job levels. Fixed effect specification; outcome: Turnover intentions (1–5 scale); plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level for job level 2 (panel a) and job level 3 or 4 (panel b); baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE.  $N=3732$ – $3800$  (panel a) and  $1671$ – $1700$  (panel b). *Source:* LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

**TABLE A7** Triggers for implementing performance evaluations.

External triggers	
New ideas of the management	0.542
External experience	0.139
External requirement	0.097
New technology	0.083
Internal triggers	
Positive internal experience	0.278
Expectations have not been met	0.139
Internal problems	0.278
Advice of consultant	0.097

*Note:* Multiple answers possible. *N*=72.  
*Source:* LPP-ADIAB 7519, own computations.

**TABLE A8** Channels II.

	Below median	Above median
Panel A: Effect of performance evaluations (FE specification) on		
Perception of		
Being fairly treated by supervisor	0.102	0.206*
Supervisors showing trust towards employees	0.134	0.179
Good guidance of supervisors	0.077	0.101
Supervisors openly explaining dissatisfaction	−0.159	−0.015
With employees' performance		
Clear communication of requirements and goals	0.043	0.038
Panel B: Effect of performance evaluations (FD specification) on		
Perception of		
Being fairly treated by supervisor	0.062	0.172
Supervisors showing trust towards employees	0.007	0.222*
Good guidance of supervisors	0.073	0.098
Supervisors openly explaining dissatisfaction	−0.153	0.052
With employees' performance		
Clear communication of requirements and goals	0.02	0.03

*Note:* Panel (A): Fixed effects (FE) specification; panel (B): First difference (FD) specification; each row represents the regression output of the respective outcome variable; outcome variables are standardized; covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared), variable pay, employee interviews, personnel development plans, open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors, performance pay, year-FE. *N*=4461–5480 (panel A) and *N*=1543–1837 (panel B).  
\*\*\*/\*\*/\* significant at the 1/5/10% level.

*Source:* LPP-ADIAB 7519, own computations.

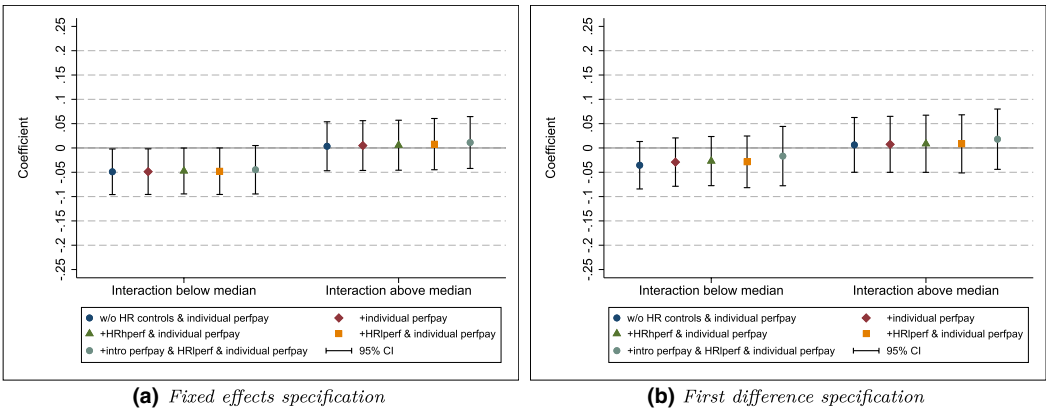


TABLE A9 Turnover intentions by treatment.

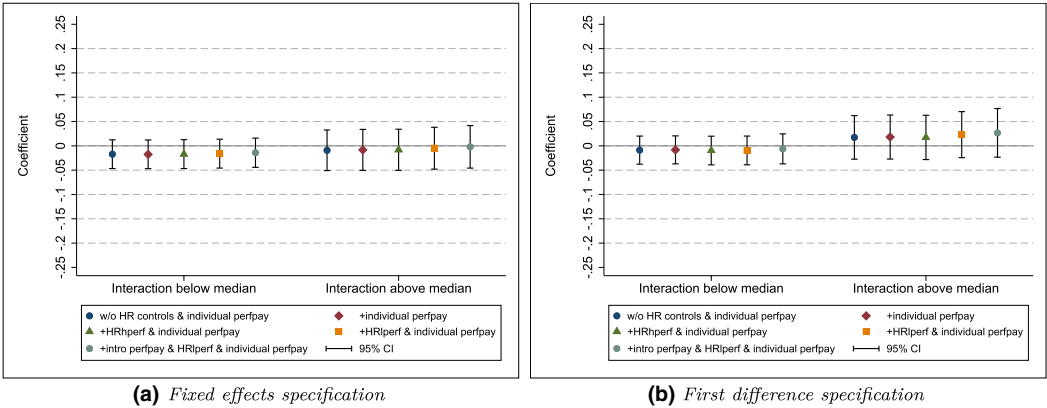
	Below median	Above median
Treatment group before treatment	1.701	1.405
Treatment group after treatment	1.481	1.452
Comparison group without performance evaluations in $t_0$	1.511	1.573
Comparison group without performance evaluations in $t_1$	1.508	1.519
Comparison group with performance evaluations in $t_0$	1.486	1.445
Comparison group with performance evaluations in $t_1$	1.537	1.455

*Note:* The table shows mean values of turnover intentions for individuals in establishments where performance evaluations are implemented (treatment group) and individuals where no introduction takes place (comparison group). Individuals from the comparison group are further distinguished by whether the establishment has already a performance evaluation system or not. The level of turnover intentions is shown in the wave before and after treatment for individuals of the treatment group and in the first ( $t_0$ ) and second ( $t_1$ ) observed wave for individuals of the comparison group.  $N = 77\text{--}84$  (treated),  $266\text{--}337$  (controls without performance evaluations) and  $689\text{--}802$  (controls with performance evaluations).

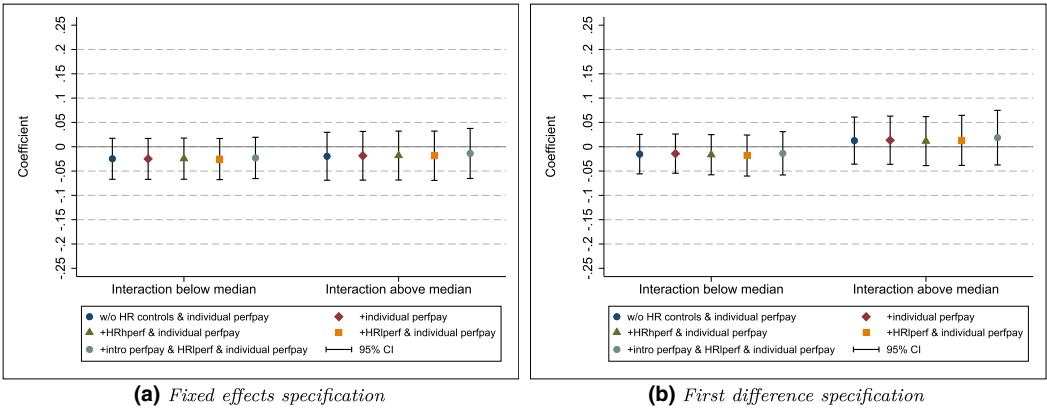
*Source:* LPP-ADIAB 7519, own computations.



**FIGURE A8** Effect of performance evaluations on actual job search by median of relative pay. Panel (a): Fixed effects specification; panel (b): First difference specification; outcome: Indicator for actual job search; plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level; baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE.  $N = 4537\text{--}4613$  (panel a) and  $1469\text{--}1509$  (panel b). *Source:* LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



**FIGURE A9** Effect of performance evaluations on employer switches by median of relative pay. Panel (a): Fixed effects specification; panel (b): First difference specification; outcome: Job-to-job transitions; plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level; baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE.  $N=5486-5585$  (panel a) and  $1837-1887$  (panel b). Source: LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](#)]



**FIGURE A10** Effect of performance evaluations on employer switches by median of relative pay, conditional on surviving. Panel (a): Fixed effects specification; panel (b): First difference specification; outcome: Job-to-job transitions conditional on no switching in prior years; plotted coefficients: Interactions between conditional relative rank position and performance evaluations on the establishment level; baseline covariates: Partner, number of children, age dummies, leadership position, job strain, working hours (squared), job autonomy, multitasking, establishment size (squared); individual perfpay: Variable pay; HRhperf controls: Employee interviews, personnel development plans; HRlperf controls: Open discussion with low performers, personnel development of low performers, change position of low performers, dismissal of low performers, investment in higher qualifications, employee survey, promoting women in management positions, change in executive board, personnel management in the board of directors; intro perfpay: Performance pay; year-FE.  $N=3891-3966$  (panel a) and  $1335-1375$  (panel b). Source: LPP-ADIAB 7519, own computations. [Colour figure can be viewed at [wileyonlinelibrary.com](#)]