

Employee-oriented management in the competition for skilled labor:
The impact of HR measures on perceived work quality and turnover

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Version: Jan, 15th 2019

Preliminary version! Please do not cite or circulate!

Abstract

Given the developments associated with demographic change and digitalization, firms encounter serious challenges to meet their demand for qualified workers. An employee-oriented human resource management is often regarded as one cornerstone in the increasingly fierce competition for skilled labor. International analyses based on cross-sections provide evidence that a professionalized HR management is positively correlated not only with measures of economic success like value added, sales, and profit (Bloom und van Reenen, 2007) but also with work quality like work-life balance and affective commitment (e.g. Bloom et al. 2009, Alfes et al. 2013). Our analyses go beyond this approach by applying panel data and fixed effects estimation. Moreover, we address the link of HR measures not only with work quality but also with actual turnover of establishments. For this, we employ the Linked Personnel Panel (LPP), a unique biennial panel dataset comprising survey information on both employers and their employees from 2012 to 2016. We show that HR measures are positive correlated with job satisfaction, commitment, engagement and turnover intention. Regarding actual turnover on the establishment level, however, our results offer a more differentiated picture: Both performance-related measures for managers and performance-unrelated measures reduce subsequent turnover, whereas performance-related HR measures for employees without managerial responsibilities increase actual turnover.

JEL: J81, M12, M53, M54.

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1. Introduction

The positive correlation between (Human Resource) Management Practices and financial performance is widely studied. The effect of management practices on employee engagement and subsequently turnover, however, is at least as important as financial performance is. Turnover is a huge cost factor. Dube et al. (2019) calculate that replacement costs can be substantial depending on firm and worker characteristics. In the light of scarceness of qualified employees these costs probably even increased. To retain qualified employees therefore is crucial to a firm to ensure innovation capacity and competitiveness.

Actual turnover, however, is only the final step in a longer process of increasing alienation. Beforehand, employees presumably react by reducing their effort and by starting to look for superior outside options. Therefore, we shed light on the question whether management practices can reduce employee turnover by means of a two-staged approach: We first analyze how perceived human resource practices affect employees' subjective working conditions and turnover intention which all relate to the existence and the degree of shirking. Second, we link the management practices to actual, observed turnover. We thereby contribute to the literature by providing evidence on the impact of perceived human resource management on subjective working conditions and turnover intention and then establishing the link to observed turnover.

The paper proceeds as follows: In chapter 2, we provide an overview and brief discussion of the relevant existing literature. Chapter 3 introduces the data and estimation approach. In chapters 4 and 5, we present both the descriptive and econometric findings. Chapter 6 concludes.

2. Literature

A long strand of literature shows how Human Resource Management Practices influence outcomes such as financial performance, productivity and employee turnover. In his seminal work, Huselid (1995) finds that High Performance Work Practices (HPWP), i.e. professional employee recruitment and selection procedures, pay-for-performance and performance management systems, and extensive employee involvement and training, impact employee productivity and turnover as well as short- and long-term financial performance. Based on this work numerous studies analyzed links between HR management practices and performance. In their meta-analysis

Combs et al. (2006) pool the findings of 92 single studies focusing on either single practices or HPWP. They confirm that single practices and HPWP enhance organizational performance. However, the effect is stronger for the latter. All in all, HPWP can explain about 20 % percent of the performance differences between organizations. A one standard deviation increase in HPW increases gross ROA by 4.6 percentage points and decreases turnover by 4.4 percentage points (Combs et al. 2006).

Another meta-study that focuses on bundles of complementary HR practices rather than HPWP confirms these findings (Subramony, 2009). The author pools single measures into three bundles: empowerment enhancing HR measures, motivation enhancing measures and skill enhancing measures. His findings argue that empowerment and motivation enhancing measures positively correlate to retention, operating performance, financial performance and overall performance. The management bundles have a stronger correlation than the single measures. Comparing the effects of HPWP and HR bundles Subramony (2009) finds larger effects for bundles.

While these literature shows the correlation between HR management practices recent research also uses management practices to explain productivity practices between firms and countries. Bloom et al. (2007) show the productivity differences can partly be explained by management practices. More recent research also confirms these findings for Germany. Broszeit et al. (2016) show that management practices positively correlates with labor productivity and the management score increases in firm size.

The discussed research has some shortcomings. Many studies only include cross-sectional data. Some have outcome measures for several periods (e.g. Huselid, 1995) but management practices only measured at one point in time. Broszeit et al. (2016) have some panel character but since the data was collected only once measurement error could be an issue. Depending on the underlying theory the identified effects can be caused by reversed causality (Shin and Konrad, 2013). The authors used the Canadian Workplace Employee Survey (WES) to analyze the direction of correlation between HR management practices and performance. Shin and Konrad (2013) confirm reciprocity and thus extend former research on this important point.

Most of the mentioned research focuses on financial outcomes. However, some literature also looks at non-monetary outcomes. Batt and Colvin (2011) show while internal mobility opportunities, relative pay, pensions, and employment security, defined as long-term orientated HR measures correlate negatively with quits and dismissals; monitoring intensity and individual commission pay, defined as short-term

performance enhancing measures relate positively to these outcomes. Bender et al. (2018) present evidence that better managed firms employ higher and dismiss lower ability employees.

Turnover is only the final step in a cascade of upstream employee reactions to (HR) management practices. Before an employee quits he or she usually decreases commitment. Work by Kehoe and Wright (2013) confirms this. The authors show a strong and positive correlation between High Performance Management Practices and affective commitment. Moreover, commitment, partly moderate the relationship between HPWP and turnover intention. Also Alfes et al. (2013) show in their work that Human resource management practices are positively correlated to engagement and negatively to turnover intention.

Bloom et al. (2009) assess the impact of management on work-life-balance. Work-life-balance in their paper is measured two ways: First by a direct response to the question how much work-life-balance is emphasized in the respective company and by aggregating the answers to different HR policies to arrange family and work matters. The authors find management practices correlate with work-life balance.

Our research extends the findings of the non-financial papers. In contrast to Bloom et al. (2009) and Kehoe and Wright (2013) who use cross-sectional data, we can make use of three wave panel data. Moreover, the LPP includes measures for work-life balance on the employee level. Therefore, we do not only rely on managerial answers but can make use of the perceived work-life balance. This reduces measurement error as answers given by managers cannot reflect all employee situations.

3. Data and estimation approach

Linked Personnel Panel

We use three waves of the Linked Personnel Panel (LPP), a linked employer-employee data set which is representative for German private sector establishments with more than 50 employees (Broszeit and Wolter, 2015; Kampkötter et al., 2016). The employer survey provides detailed information about a variety of HR management practices along the dimensions recruitment and selection, performance management, talent management and employee development, retention management and corporate culture. Additionally, a number of firm characteristics such as ownership structure,

the number of hierarchical levels, business strategy, and firm management is available. The establishment survey includes at least 771 firms. The establishment survey has taken part bi-annually since 2012. The most recent was collected in 2016.

Out of the surveyed establishments, a random sample of employees of at least 6,500 employees has been interviewed via telephone (CATI) about job and workplace characteristics, perceptions about the job and HR practices, personal attitudes and attitudes towards their organization. The employee surveys took part outside working hours to reduce bias from employers. The interviews were collected in the beginning of 2013, 15 and 17.

The information from establishments and employees are linkable but the employee survey also tracks employees who leave the employer to work for another firm.

Integrated Employment Biographies

A unique feature of the LPP is the possibility to link both surveys to various other data sets such as the IAB establishment panel or administrative data on the individual level. We link the surveyed establishments to the administrative employment biographies. This gives us an extensive research data set containing the biographies of all employees that have worked for our employers at least one day in-between 2012 and 2016. The data is accurate to the day allowing us to calculate employee turnover.

Management Practices and Outcomes

Management practices are measured in the establishment as well as in the employee survey. Not all practices are included in both surveys, however. Table A1 gives a summary of the management items in the employer and employee survey that we use.

For outcomes we use several measures on individual and aggregated level. On individual level we use the following survey outcomes[‡]:

Job satisfaction – Employees were asked: “How satisfied are you today with your job?”. Job satisfaction is measured on an 11 point Likert scale, where 0 means totally unhappy and 10 refers to totally happy. The question is commonly used, e.g. in SOEP.

Employee Engagement – The LPP uses the nine-item short scale of the Utrecht Work Engagement Scale-9 (Schaufeli et al., 2002; Schaufeli and Bakker, 2004). The answers are on a 5-point Likert scale from 1 – daily to 5 – never. Employees were asked:

[‡] For more information on the validity of outcomes see Kampkötter et al. (2016)

- At my work, I feel bursting with energy.
- At my job, I feel strong and vigorous.
- I am enthusiastic about my job.
- My job inspires me.
- When I get up in the morning, I feel like going to work.
- I feel happy when I am working intensely.
- I am proud of the work that I do.
- I am immersed in my work.
- I get carried away when I am working.

We recoded and aggregated the answers to obtain a scale ranging from 1 low engagement to 5 high engagement.

Turnover intention – To measure turnover intention we use the answers to the 5-point likert scale ranging from 1- never to 5 - every day to the question: “How many times in the past 12 months have you thought about changing your job?”

Actual turnover – On aggregate level we rely on the administrative data to measure actual employee turnover. Although unfortunately we cannot distinguish between voluntary and involuntary movements, we observe the entirety of both entries into and exits from our interviewed establishments.

We define the turnover rate of each establishment i as the number of separations over each two-year period divided by the average of the sum of the number of employees in t and $t-1$, i.e. in the beginning and the end of this period. The results is multiplied by 100 for illustration purposes:

$$turn_i = \frac{L_{sep,i}}{(L_{t-1,i} + L_{t,i}) * \frac{1}{2}} * 100$$

Estimation approach

For our analyses on the link between HR measures and perceived work quality, we draw on an estimation approach including worker fixed effects. This way, we can credibly tackle the issue of (time-constant) unobserved individual heterogeneity that is supposedly of considerable significance in our research setting. Apart from this time-constant heterogeneity, we also include a comprehensive vector of potentially time-varying establishment and individual characteristics which we consider to be at play in the relationship between HR measures and individually perceived work quality

measures. We control for the basic employment structure by including the total number of employees, the share of women, of part-time workers, of semi-skilled and of highly-qualified employees, as well as of new hires and of drop-outs to capture turnover. We also take into account whether an establishment's strategy evolves around quality leadership, whether competition is high, as well as the type of management.

Apart from this, we also account for individual characteristics like age, whether someone is a white-collar worker, net wages, whether an employee has managerial responsibilities, for household size and whether he or she has a partner. Most importantly, though, we include a set of HR measures into our specification which is measured at the worker level. The latter is crucial, as an individual's assessment of whether he or she receives or benefits from a certain measure entails more credibility than an employer's report, since a firm-reported measure does not necessarily mean that this measure involves every worker within that establishment. Research by McCarthy et al. (2010) support this. In a field study among line managers the authors find that the implementation of measures is inconsistent across managers with the same production plant.

We look at variable pay components (bonuses), appraisal interviews, the opportunity to work from home on a regular basis, and the offer to participate in further training. Finally, we include year dummies to capture general (economic) developments over time.

Since the second part of our paper which addresses actual turnover is based on the employer level, there is a different set of regressors involved. Nevertheless, both estimations have in common that fixed effects are employed, individual fixed effects in the first part and establishment fixed effects in the second part.

Most included regressors represent basic (time-variable) firm characteristics, among which are establishment size, staff composition with respect to women, part-time workers and qualification, as well as type of ownership. Additionally, we control for industrial relations in terms of collective bargaining at either the firm or the industry level and the existence of a works council. We further take into account whether an establishment is currently facing high competition and whether its strategy is focused on quality leadership (as opposed to cost leadership). And last but not least, we introduce total factor productivity from a straightforward fixed effects Cobb-Douglas production function involving labor and capital to our estimation function, hence controlling for the fact that better performing establishments supposedly both can afford more HR measures and are more successful in retaining their employees.

4. Descriptives

Management Practices

Table 1 panels A and B give an overview of observed management practices on employee and employer level. Table 1a focuses on the individual level practices. We have information for three years. For performance pay we see no time trend. In 2013 64 percent of all employees said they receive some wage component that is linked to performance. In 2017 65 percent reported performance pay. For other performance related measures we see an increase. In 2017 58 percent of all employees reported written target agreements (compared to 51 percent in 2013). The use of feedback talks increased from 35 percent in 2013 to 43 percent in 2017. For home office a management practice that has been controversial debated in the last years, we don't see a clear time trend. It has been used by 36 percent of all employees in 2013. In 2017 37 percent of all employees report to work at home at least from time to time. In contrast the awareness about the importance of further training seems to increase. Where 2013 18 percent participated in a training course in 2017 23 percent reported training participation.

[Table 1 about here]

On the employer level we have numerous management practices table 1b provides basic statistics for. As noted before, we group the various measures into three separate indices for performance-related measures for managers, performance-related measures for regular employees (i.e. without managerial responsibility), and performance-unrelated measures. The descriptives show that the three indices are similarly distributed, although the category for performance-unrelated HR measures has a higher maximum (5 measures) than the two others (each 4). From all three type bundles, establishments apply 2.2 to 2.4 measures on average.

Outcomes

On employee level we focus on the subjective outcomes job satisfaction, engagement and turnover intention. Table 2 gives an overview of the observed outcomes. On average they are time constant, therefore, we only report their general means. The employees in our establishments are on average satisfied with their job (7.6 on a scale up to 10). Also, the standard deviation is low. A study from the GSOEP shows a

somewhat lower job satisfaction level of around 6.9 (Fietze, 2011). Also work engagement is high on average with 3.7 on a 5 point scale. For convenience we use the standardized value of job satisfaction and work engagement in our regression.

Employees in Germany are attached to their employers. Real turnover is lower than in the US (Pries & Rogerson 2005), which ought to result from higher turnover intention. Only about 5 percent of the employees think at least a few times a week about changing employers. The vast majority of two thirds think only a few times a year or even never about changing employers.

[Table 2 about here]

To give a first impression of the association between the HR measures indices and establishment-level tenure, figure 1 illustrates the unconditional mean log turnover rates per index level. In all three panels of the figure, it appears as if turnover is smaller when more HR measures are currently in place at the establishment. However, only with the performance-unrelated measures this correlation is big enough to bear scrutiny in terms of a test for statistically significant differences in means, whereas in case of the performance-related measures only the difference in means between no measures and all (4) measures turns out to be significant.

[Figure 1 about here]

5. Econometric results

Turnover intention

As mentioned before, our empirical analysis' focus is twofold. By means of applying fixed effects estimations, first, we address the question whether there is a relationship between certain HR measures and employee's perceived work quality in terms of engagement, turnover intention and the most general operationalization, job satisfaction. Furthermore, since neither of these concepts necessarily translates into actual worker behavior, in a second step, we regress HR measures on establishment-level turnover rates. Although each specification relies on a different level, one at the employer level and one on that of employees, both entail a comprehensive vector of firm-level characteristics – beyond the individual regressors in the worker-level estimation.

[Table 3 about here]

The results of regressing turnover intention on HR measures including fixed effects and the mentioned set of regressors are displayed in Table 3. Column (1) shows the correlation of management practices including basic individual level controls. Performance rewarding measures, i.e. employee feedback talks, target agreements, and pay for performance decrease the turnover intention. All coefficient except target agreements are significant at the 1 percent level. Target agreements and feedback talks are highly correlated.

For working from home we interestingly see a positive coefficient. Working from home is associated with a higher turnover intention. This could be due to sorting of less attached employees into home office. Participating in further training courses is negatively correlated with turnover intention. The literature, however, shows the correlation is not obvious (Dietz and Zwick, 2016).

Column (2) includes firm specific controls. Aside from target agreements which turn insignificant, results remain robust.

Management practices may influence different types of employees differently. Performance related measures are especially common for managers. We therefore in column (3) interact the self-reported manager indication with performance related management practices. For performance pay we see no additional effect for managers. The coefficient for target agreements is significant in this setting, the interaction coefficient is not, indicating that non-managerial employees have a lower turnover intention when they have a target agreement. For feedback talks we find an even stronger effect for managers as the effect in the baseline regression, suggesting when managers get a feedback talk they are even less likely than other employees to think about switching employers.

So far results are based on pooled OLS regressions. Column (4) and (5) report the same regressions as (2) and (3) except adding firm and time fixed effects. When we add fixed effects the size and significance of the management measures decreases. Except for performance pay all effects become insignificant. The coefficient for performance pay decreases by two third but stays significant on the 5 percent level. Column (5) shows the interactions with management position. Again, only performance pay stays significant. The interaction shows that the effect seems to be driven by performance pay for managers. To sum our findings on turnover intention: Only performance pay for managers seems to lower turnover intention in the short run.

Job satisfaction

[Table 4 about here]

Table 4 shows the results on job satisfaction. Columns (1) and (2) show basic pooled OLS results. The introduction of performance pay increases job satisfaction by .17 standard deviations which amounts to an increase of .28 points in job satisfaction. The coefficients for feedback talks and further training have a similar size. The introduction of target agreements is associated with an increase of job satisfaction of about .14. The results for home office are insignificant. The results are robust when we add firm controls. In the interacted model in column (3) we find no significant interaction term except for target agreements. Here again target agreements for managers have the opposite effect as then target agreements for non-managers. The effect for managers levels out.

The fixed effect results in column (4) show significant results for home office and further training. These results suggest that within firms the introduction of home office is associated with an increase in job satisfaction, whereas on average the level of job satisfaction does not correlate with the possibility to work from home. The introduction of home office rises job satisfaction by .18 standard deviations.

Work engagement

We find a positive correlation between all observed management practices and work engagement in column (1) table 5. As we start including firm controls (column 2) performance pay turns insignificant. Comparing firms with and without the respective management practices we find small differences in work engagement. Further training participation has the most substantial effect on work engagement. Employees that took part in further training courses have .13 point higher work engagement. Yet, employees probably sort into training courses if they are more engaged. In our interacted regression model (column 3) we don't see that managers which received any of our management practices have a higher work engagement than regular employees.

When we introduce fixed effects (column 4) we find robust results for home office and feedback talks. The coefficient for home office drops from .17 to .06 but stays significant on the 1 percent level. Again, for managers we that receive management practices are not different in work engagement than regular employees.

[Table 5 about here]

Jointly addressing our employee level analyses, we can take away from the tables that variable pay is associated with a lower turnover intention, whereas it seems to be unrelated to the other three dependent variables. On the other hand, all three other concepts appear to increase job satisfaction, and work engagement, even when jointly introduced to the estimation equation, hence taking into account the partially substantial correlation between them.

Judging by those results, we have established that an employer-oriented HR management is actually associated with a more positive assessment of employees regarding their work quality. However, as this only is important to employers if these perceptions lead to actual behavior, we consequently address the impact of HR measures on turnover in the following.

Turnover

Now that we have established the link between HR measures and perceived work quality at the employee level, we turn to examine whether the application of such measures is associated with actual, observed turnover at the establishment level. To pursue this goal, we regress the establishment-level turnover rate on various types of professional HR management also measured at the establishment level. Owing to the change of estimation levels from the worker to the employer level, we can draw on a larger set of HR measures than before. We group those measures with respect to their nature to three indices: (1) performance-related measures (variable pay, performance appraisals, appraisal interviews and target agreements) for managers, (2) performance-related measures for employees without managerial responsibilities, and (3) performance-unrelated HR measures (employee surveys, development plans, staffing plans, promotion of aspirations to obtain a higher educational degree, and promotion of women to increase their share in management positions).

[Table 6 about here]

Table 6 displays the coefficients from a corresponding fixed-effects estimation. Controlling for a rich set of regressors as presented in chapter 3, we find different results for the three HR measure indices: While performance-related measures (variable pay, performance appraisals, appraisal interviews, target agreements) for managers reduce turnover, the exact same measures for employees without managerial respon-

sibility are associated with higher turnover. Moreover, introducing performance-unrelated measures like staffing plans and employee surveys seems to exert no effect whatsoever.

6. Conclusion and discussion

Over the course of this paper, we have addressed the link between the application of HR measures and employee turnover. First, we regressed perceived work quality including turnover intention on four different measures on the individual level. Second, we examined whether HR measures are associated with actual turnover on the establishment level. Both analyses rely on fixed effects, taking into account either employee or employer unobserved time-invariant heterogeneity.

The results suggest that HR measures are positively associated with perceived work quality. While variable pay can decrease turnover intention, appraisal interviews, the opportunity to work from home, and further training measures increase job satisfaction, and engagement.

Regarding actual turnover at the establishment level, we provide evidence that both performance-related measures applied to managers and performance-unrelated measures can significantly attenuate turnover. Performance-related measures for employees without managerial responsibilities, however, are associated with higher turnover rates.

Our findings emphasize the importance of HR measures for avoiding costs associated with shirking and turnover. Having said this, they also make a strong case for the responsible and differentiated application of such measures. Given our results, establishments should be very cautious with performance-related measures for non-managers, as their application can backfire and increase turnover. Nevertheless, since our data do not allow a closer look at this issue, our results should not be interpreted as an axiomatic plea against the utilization of such measures for regular employees. Further research needs to shed light on this.

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Tables and Figures

Table 1 Descriptives on outcomes

		N	mean	sd	min	max
<i>Panel A: employee level</i>						
Turnover intention	Job satisfaction	13,627	7.587	1.674	0	10
	Engagement	13,281	3.713	0.791	1	5
	daily	13,618	0.013	0.113	0	1
	few times a week	13,618	0.036	0.186	0	1
	few times a month	13,618	0.083	0.276	0	1
	few times a year	13,618	0.226	0.418	0	1
	never	13,618	0.642	0.479	0	1
<i>Panel B: employer level</i>						
	Performance-related HR measures for managers (<i>index</i>)	1,420	2.392	1.358	0	4
	Performance-related HR measures for non-managerial staff (<i>index</i>)	1,420	2.216	1.342	0	4
	Performance-unrelated HR measures (<i>index</i>)	1,420	2.392	1.485	0	5

Note: Own calculation, results are weighted to account for survey selection.

Table 2 Descriptives on employee level outcomes

		N	mean	sd	min	max
Turnover intention	Job satisfaction	13,627	7.587	1.674	0	10
	Engagement	13,281	3.713	0.791	1	5
	daily	13,618	0.013	0.113	0	1
	few times a week	13,618	0.036	0.186	0	1
	few times a month	13,618	0.083	0.276	0	1
	few times a year	13,618	0.226	0.418	0	1
	never	13,618	0.642	0.479	0	1

Note: Own calculation using LPP-employee data, results are weighted to account for survey selection.

Figure 1 Mean log turnover rate by index score (establishment level)

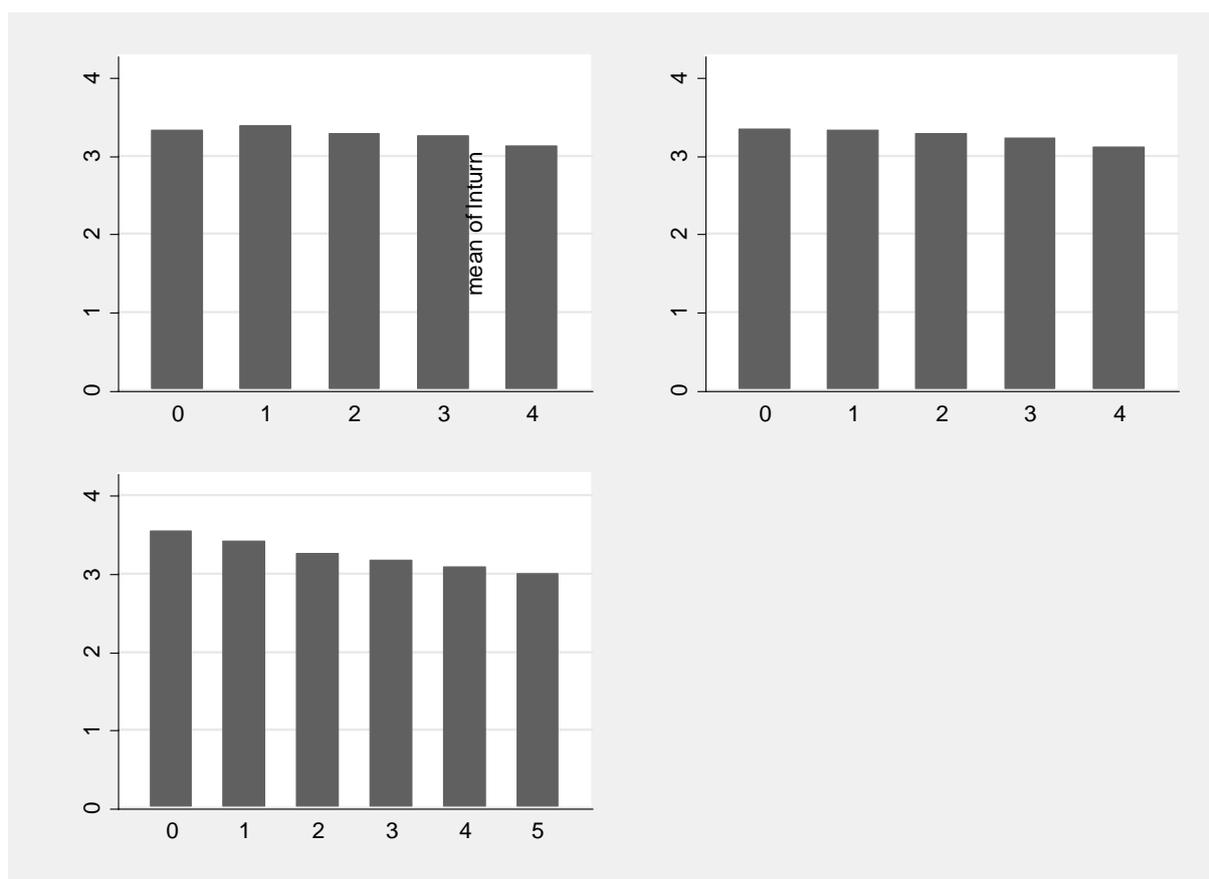


Table 3 Perceived management practices and turnover intention

	OLS Turnover intention			Fixed Effects Turnover intention	
	(1)	(2)	(3)	(4)	(5)
performance pay	-0.192*** (0.02)	-0.167*** (0.02)	-0.169*** (0.02)	-0.069** (0.03)	-0.044 (0.03)
home office	0.133*** (0.02)	0.113*** (0.03)	0.114*** (0.03)	-0.027 (0.04)	-0.021 (0.04)
target agreements	-0.034 (0.02)	-0.037 (0.03)	-0.059* (0.03)	-0.060 (0.04)	-0.043 (0.05)
feedback talks	-0.119*** (0.02)	-0.096*** (0.02)	-0.061** (0.03)	-0.058 (0.04)	-0.038 (0.04)
further training participation	-0.086*** (0.02)	-0.080*** (0.02)	-0.080*** (0.02)	-0.034 (0.03)	-0.030 (0.03)
manager	-0.015 (0.02)	-0.034* (0.02)	-0.001 (0.04)	-0.042 (0.05)	0.081 (0.08)
manager x performance pay			0.004 (0.04)		-0.112* (0.06)

manager x target agreement			0.069		-0.053
			(0.04)		(0.07)
manager x feedback talk			-0.114**		-0.066
			(0.05)		(0.07)
Constant	2.265***	2.200***	2.200***	-12.457	-12.034
	(0.24)	(0.28)	(0.28)	(11.17)	(10.92)
Individ. Controls	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	Yes	Yes	Yes
R ²	0.117	0.131	0.131	0.016	0.018
No of firms		1138	1138	1148	1148
N	12356	12437	12437	13119	13136

Notes: LPP 2012-2017, matched sample. Standard errors are in parentheses under coefficient estimates, columns (2) to (5) standard errors are clustered by firm identifier, Columns (1) to (3) OLS, Columns (4) and (5) person and year fixed effects. Dependent variable is standardized with mean zero and standard deviation of one. Individual controls include: age, age², weekly working hours, female dummy, white collar dummy, schooling dummies, education dummies, log(monthly wage), dummy fixed term contract, dummy partner, dummy household size, year dummies. Firm controls include: log(size), share females, share part time, share of educational groups, inflows, outflows, competition, ownership, industry dummies. Asterisks indicate significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 4 Perceived management practices and z-score of Job Satisfaction

	OLS z-score Job satisfaction			Fixed Effects z-score Job satisfaction	
	(1)	(2)	(3)	(4)	(5)
performance pay	0.168***	0.158***	0.153***	0.046	0.043
	(0.02)	(0.02)	(0.03)	(0.04)	(0.05)
home office	0.013	0.003	0.003	0.166***	0.165**
	(0.02)	(0.03)	(0.03)	(0.06)	(0.06)
target agreements	0.085***	0.079***	0.115***	0.042	0.057
	(0.02)	(0.03)	(0.03)	(0.04)	(0.06)
feedback talks	0.143***	0.126***	0.104***	0.059	0.042
	(0.02)	(0.03)	(0.03)	(0.05)	(0.06)
further training participation	0.164***	0.168***	0.168***	0.087***	0.086***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
manager	0.075***	0.097***		-0.101*	
	(0.02)	(0.02)		(0.05)	
manager x performance pay			0.016		0.022
			(0.04)		(0.08)
manager x target agreement			-0.106**		-0.047
			(0.05)		(0.08)

manager x feedback talk			0.068 (0.06)		0.051 (0.09)
Constant	-1.279*** (0.23)	-1.392*** (0.31)	-1.400*** (0.31)	13.139 (12.44)	13.050 (12.36)
Individ. Controls	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	Yes	Yes	Yes
R-sq	0.064	0.067	0.067	0.017	0.017
N_clust		1138	1138	1138	1138
N	16648	12568	12568	12568	12585

Notes: LPP 2012-2017, matched sample. Standard errors are in parentheses under coefficient estimates, columns (2) to (5) standard errors are clustered by firm identifier, Columns (1) to (3) OLS, Columns (4) and (5) person and year fixed effects. Dependent variable is standardized with mean zero and standard deviation of one. Individual controls include: age, age², weekly working hours, female dummy, white collar dummy, schooling dummies, education dummies, log(monthly wage), dummy fixed term contract, dummy partner, dummy household size, year dummies. Firm controls include: log(size), share females, share part time, share of educational groups, inflows, outflows, competition, ownership, industry dummies. Asterisks indicate significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 5 Perceived management practices and work engagement

	OLS z-score Work engagement			Fixed Effects z-score work engagement	
	(1)	(2)	(3)	(4)	(5)
performance pay	0.038** (0.02)	0.039* (0.02)	0.047* (0.03)	-0.033 (0.03)	-0.025 (0.04)
home office	0.072*** (0.02)	0.068** (0.03)	0.069** (0.03)	0.094** (0.04)	0.092** (0.04)
target agreements	0.079*** (0.02)	0.081*** (0.03)	0.094*** (0.03)	-0.021 (0.03)	-0.048 (0.04)
feedback talks	0.107*** (0.02)	0.119*** (0.03)	0.109*** (0.03)	0.127*** (0.04)	0.134*** (0.05)
further training participation	0.165*** (0.02)	0.168*** (0.02)	0.168*** (0.02)	0.052** (0.02)	0.053** (0.02)
manager	0.232*** (0.02)	0.243*** (0.02)	0.258*** (0.04)	0.046 (0.04)	0.046 (0.06)
manager x performance pay			-0.028 (0.04)		-0.028 (0.05)
manager x target agreement			-0.037 (0.05)		0.084 (0.07)
manager x feedback talk			0.030 (0.05)		-0.024 (0.06)

Constant	0.028 (0.23)	0.012 (0.30)	0.004 (0.31)	11.263 (9.46)	11.367 (9.50)
Individ. Controls	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	Yes	Yes	Yes
R ²	0.067	0.073	0.073	0.027	0.027
No of firms		1137	1137	1137	1137
N	16238	12282	12282	12282	12297

Notes: LPP 2012-2017, matched sample. Standard errors are in parentheses under coefficient estimates, columns (2) to (5) standard errors are clustered by firm identifier, Columns (1) to (3) OLS, Columns (4) and (5) person and year fixed effects. Dependent variable is standardized with mean zero and standard deviation of one. Individual controls include: age, age², weekly working hours, female dummy, white collar dummy, schooling dummies, education dummies, log(monthly wage), dummy fixed term contract, dummy partner, dummy household size, year dummies. Firm controls include: log(size), share females, share part time, share of educational groups, inflows, outflows, competition, ownership, industry dummies. Asterisks indicate significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 6 Management practices and actual turnover at the establishment level

Dependent variable: (log) turnover rate	Pooled Ordinary Least Squares	Fixed effects panel estimator
	(1)	(2)
Performance-related HR measures for managers (<i>index</i>)	-0.001 (.034)	-.057* (.029)
Performance-related HR measures for non-managerial staff (<i>index</i>)	-1,98e-05 (.034)	.066** (.031)
Performance-unrelated HR measures (<i>index</i>)	-.032 (.020)	-.057** (.022)
Constant	2.900 (.157)	2.904*** (.305)
No of firms	792	792
N	1,420	1,420

Notes: LPP 2012-2017, matched sample. Standard errors in parentheses and clustered by establishment identifier. The dependent variable is logarithmized. Controls for both specifications include: establishment size (number of employees; 4 dummies), share of women, share of part-time workers, qualification shares (3 categories), collective agreement (3 categories), works council, ownership, competition, quality leadership strategy (v. cost leadership), and year dummies. Specification (1) also entails: industry (5 dummies) and region (4 dummies). Asterisks indicate significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Appendix

Table A- 1 Management items in employer and employee survey

Management practice	Survey Question
Panel A: Employee survey	
Performance pay	Do you receive any performance-related bonuses or extra payments in addition to your basic salary or wage? Meant are bonuses, one-time payments, profit-sharing bonuses, premiums, gratifications etc. <i>Answer: Yes/ No</i>
Home office	Do you work from home for your employer – even if only occasionally? <i>Answer: Yes/ No</i>
Target agreements	Did your superior agree with you on the objectives fixed in writing during the appraisal interview? <i>Answer: Yes/ No</i>
Performance Appraisals	Did you have an appraisal interview with your superior [last year]? <i>Answer: Yes/ No</i>
Further training participation	Have you taken part in any courses of further vocational training since [beginning of previous year]? <i>Answer: Yes/ No</i>
Panel B: Establishment survey	
Staffing plans	Does your establishment/office have a written staffing plan? <i>Answer: Yes/ No</i>
Appraisal interviews	Do you conduct structured appraisal interviews in your establishment/office at least once a year? <i>Answer: Yes/ No</i>
Appraisal interviews (target groups)	With whom do you conduct the structured appraisal interviews? <i>Answer: With management staff/ with some employees without management responsibility/ with all employees</i>
Target agreements	Does your establishment/office use written target agreements? <i>Answer: Yes/ No</i>

Performance Pay	Does your establishment/office have a salary system with variable proportions? <i>Answer: Yes/ No</i>
Performance Pay (target groups)	Is the salary system with variable proportions applicable to management staff only or also for employees without management responsibilities? <i>Answer: Only for management staff/ Also for employees without management responsibilities</i>
Performance Appraisals	Is a review of the performance of the employees carried out by the respective supervisor in your establishment/office at least once a year? <i>Answer: Yes/ No</i>
Performance Appraisals (target groups)	For whom are the annual performance appraisals issued? <i>Answer: For management staff/ For some of the employees without management responsibility/ For all employees</i>
Development plans	Are there any development plans for employees in your establishment/office? <i>Answer: Yes/ No</i>
Support for higher educational qualification	Have you actively promoted employees' qualification activities leading to a higher educational qualification, e.g. by releasing from work or partially bearing costs? This includes e.g. further training to master craftsmen, technician, post-graduate program, MBA, doctorate. <i>Answer: Yes/ No</i>
Employee surveys	Does your establishment/office regularly conduct employee surveys? <i>Answer: Yes/ No</i>
Promotion of women in management position	Do you pursue the goal to increase the proportion of women in management positions? <i>Answer: Yes/ No</i>

Source: LPP employee and employer questionnaire. Translated from German, own illustration.