The differing effects of individual and group incentive pay on worker separation : evidence using Finnish panel data

The Differing Effects of Individual and Group Incentive Pay on Worker Separation [+]

Derek C. Jones*, Panu Kalmi, Takao Kato*** and Mikko Mäkinen******

Abstract: We investigate the role of individual incentive (II) and group incentive (GI) pay as determinants of worker separation using a large panel data set from Finland during 1997-2006. For white-collar workers, GI pay is associated significantly with an *increased* probability of separation (diminished employment stability), but in large firms only. For blue-collar workers, II pay is associated with a *decreased* probability of separation (enhanced employment stability), in both small and large firms. By providing results for different forms of performance pay in a single study, some of our findings are quite novel. In accounting for differences in our empirical findings compared to those in earlier studies, our results suggest that outcomes depend on the differing institutional contexts found in coordinated market economies (such as Finland) and liberal market economies.

JEL Codes: J33; M52; J31; J62; J63
Keywords: performance pay; worker separation; job mobility

* Dept. of Economics, Hamilton College, Clinton, NY 13323, djones@hamilton.edu
** Dept. of Economics, University of Vaasa, PO Box 700, 65101 Vaasa, Finland, panu.kalmi@uwasa.fi
*** Dept. of Economics, Colgate University, Clinton, NY 13346 and IZA, tkato@colgate.edu
**** Bank of Finland, PO Box 160, 00101 Helsinki, Finland, mikko.makinen@bof.fi (corresponding author)

[+]We are grateful to the Emil Aaltonen foundation for financial support. We are indebted to the Confederation of Finnish Industries (EK) for providing the permission to use their data on which the empirical analysis is based. We also thank Tomi Kyyrä, Gabriel Burdin and Jeff Pliskin, as well as participants at several conference including the International Association for the Economics of Participation 2012, the SOLE/EALE World Conference 2015 and the Leeds festival of Industrial Democracy 2017 for helpful comments. The usual disclaimer applies. Part of the study was conducted by Mäkinen at Aalto University.

1. Introduction

The rapid diffusion of performance related pay (PRP), a key element of HRM, is a phenomenon underway in many economies. In tandem with the increasing use of PRP, a rich literature from multiple disciplines has emerged to investigate diverse issues such as the impact of PRP on firm performance. However, one area in this research that has received less attention is how different types of PRP schemes, including both individual incentive pay (linking pay to individual performance) and group incentive pay (tying pay to group performance) are related to employee turnover.

Turnover is an important issue since much evidence shows that employee turnover rates can be excessive in many industrialized labor markets (e.g. Davis and Haltiwanger, 1999). Firms may dislike undue turnover of full-time workers because it is associated with search and selection costs. Many full-time workers too may have an aversion to high turbulence in labor markets. More stable employment relationships provide stronger incentives for incumbent employees as well as firms to invest in firm-specific human capital. Also, if worker separation is due to displacement, displaced workers may face extensive and long-lasting wage and earning losses after job termination (see, e.g., Jacobson, LaLonde, and Sullivan, 1993; Couch and Placzek, 2010; Korkeamäki and Kyyrä, 2014). In this study, our turnover variable is defined as the separation of an individual from the company for whatever reason. We use a large linked employer-employee dataset-- where observations are individual employees, but we are able to use information on firm characteristics at the same time.

Much previous empirical work on this theme tends to focus on how only one particular form of PRP, namely profit sharing, a group incentive pay scheme, is related to worker separation (e.g. Chelius and Smith, 1990; Kruse, 1992). Using our rich linked employer-employee panel

data set, we are able to investigate the impact on worker separation of *differing* types of PRP including individual incentive pay, where individual worker performance is used as a primary measure of performance, and group incentive pay, where group performance (such as team output and firm-level profit) is used as a primary measure of performance. Further, unlike previously published studies on the topic, we are able to use matched employee-employer data. These data are especially suitable for studying turnover at the individual level, because they also permit controls for confounding variables at the levels of both employee and firm characteristics to be included.

As we discuss in more detail later, the theoretical literature on the expected overall direction of the impact of PRP on turnover is ambiguous and does not pay sufficient attention to differing institutional context. In addition, most previous empirical studies linking PRP to worker turnover focus on "liberal market economies" (LMEs) especially the U.S. (e.g. O'Halloran, 2012) and the U.K. (e.g. Green and Heywood, 2011). While as Bryson et al. (2012) note, the coverage of incentive pay schemes among European countries is the largest in the Nordic countries, notably Finland where it is around 30% of employees and surpassed only by the U.S. (over 40% of employees), there are no published studies on how PRP matters for worker separation in "coordinated market economies" (CMEs) such as Finland. However, the institutional characteristics of CMEs such as strong wage compression and long tradition of mutual trust between employee and employer representatives can be expected to lead to large differences in the way that PRP affects worker separation compared to institutional characteristics in LMEs. Hence our analysis of Finnish panel data provides some of the first evidence on how PRP is related to worker separation in a CME. Our rich data enable us to include a wider range of covariates than previous work, including measures for wage dispersion (e.g. Riddell, 2012), working conditions (such as undesirable work schedules, e.g. Cottini et al., 2011), and regional

controls that may influence turnover e.g. through labor market conditions (e.g. Booth et al., 1999).

Our findings indicate that group and individual incentive pay matter for worker separation as do many of our covariates. But our specific findings sometimes differ than those emerging from studies of LMEs. In particular we find that: (i) individual incentive pay and group incentive pay may affect employment stability differently. Perhaps surprisingly and in contrast to much of previous literature, group-based PRP is not associated with greater employment stability, whereas individual PRP is (for blue-collar workers); (ii) In general, white-collar and blue-collar workers respond to PRP differently. In accounting for differences in empirical findings across various settings, one possible explanation is that outcomes depend on the differing institutional contexts found in CMEs (such as Finland) and LMEs.

The paper is organized as follows. In the next section we provide a conceptual framework and review related empirical work. Section 3 describes our data and presents summary statistics. In Section 4 we outline our empirical strategy. Section 5 reports our key findings. The final section provides conclusions and discusses implications.

2. Conceptual Framework and Prior Studies

When reviewing existing studies of worker separation under PRP, the fundamental concern is the expected overall direction of the possible association between *PRP and worker separation.* There are several strands of literature that are directly relevant here.

Conceptual framework

One argument often discussed in the compensation literature is based on Vroom's (1964) expectancy theory (see e.g. Magnan and St. Ogne, 2005). This so-called "line of sight" argument posits that for PRP to influence behavior, employees must expect that *they can influence the*

measure of PRP and that *they will be compensated according to that measure.* The more distant the measure and the more complicated the PRP system, the weaker are the effects. For instance, if compensation is related to profitability, but profitability is determined largely by other issues than employee effort (e.g. by general market outlook or strategic decisions made by management), then the line of sight in such a compensation system is arguably weak. On the other hand, when payment is tied closely to a measure that employees actually can influence, like the number of pieces produced, then the productivity effects of PRP systems can be quite significant (Lazear, 2000).

The free-rider argument (e.g. Knez and Simester, 2001) is related but distinct from line of sight issues. When employees are rewarded on the basis of team rather than individual output, there is a tendency for individual employees to free ride on the efforts of team members, leading to a suboptimal effort levels. This problem is more pronounced the larger the team on which output results is based. While the problem can be remedied by suitable mutual monitoring systems, it can be especially pronounced under profit-sharing and stock-based schemes.

The line of sight effect (together with the related free-rider effect) have often been cited as arguments against the efficacy of collective pay systems based on firm profitability or share price for non-managerial employees (e.g. Hall and Murphy, 2002). However, there is an empirical counterargument-- the bulk of the evidence finds that collective pay systems are positively related to performance (e.g. Kruse et al., 2010). Also there are questions related to their extensive use (Bryson et al., 2012): If collective systems are so ineffective from an incentives perspective, why are they so commonly used?

One of the more sophisticated arguments explaining the use of group-based PRP relates to fairness and reciprocity. Employees may perceive profit-sharing of stock-based compensation as fair conduct by employers and elicit more effort in response as a form of gift exchange (Akerlof;

1982; Fehr and Gächter, 2000; Cappelli et al., 2019). This is also related to earlier managerial and psychological literature suggesting that PRP and especially collective pay systems help to retain employees through enhancing employee commitment (e.g. Florkowski, 1987), job satisfaction (e.g. Long, 1980), and worker motivation (e.g. Hammer et al., 1981).

These arguments have implications for turnover as well. If employees view collective PRP systems as confusing and unrewarding, then they may vote with their feet. Conversely, if pay systems are aligned with employee expectations, this may encourage employees to stay at the firm.

The issues of PRP and turnover are closely linked with the literature of PRP and *employee sorting.* One of the main predictions arising from that literature is that individual PRP leads to higher inequality in pay and to quits by the least productive employees, while more productive employees are likely to be better off under PRP systems based on individual performance (Lazear, 1986). If employees are risk averse, their degree of risk aversion becomes an additional parameter to consider in the quit decision.

Under a collective PRP system, the sorting issue is less straightforward. To the extent collective pay systems reduce wage inequality, they may work against the interest of the most able employees. The least able employees may in turn face peer pressure to improve their performance, which may lead to further quits (Hamilton et al., 2004). Thus collective pay systems may sort out both the most and least productive employees (Weiss, 1987). In this paper, we focus on employee turnover rather than employee sorting, because we do not have direct data on employee performance.

There are also other mechanisms through which PRP systems may affect employee turnover. One of the most influential theories in this regard is the share economy arguments of Weitzman (1984), based primarily on profit-sharing. While under conventional payment systems

wages are inflexible and employment flexible, it is claimed that under profit-sharing wages become flexible and employment would be stabilized. The argument led to a considerable theoretical debate (see e.g. Nordhaus, 1988) and to extensive empirical testing (to be reviewed later). However, a clear prediction emerging from that literature is that collective PRP systems would be associated with less worker turnover.

More recently, the literature has investigated complementarities between PRP and acquisition of firm-specific human capital through training. PRP might increase returns to firm-specific training and thereby reduce separations. The literature has focused especially on profit-sharing and training (Gielen, 2011; Green and Heywood, 2011; Kraft and Lang, 2013), but Guthrie (2000) has made a similar argument in the context of individual PRP.

Finally, there is a literature considering the effects of variable pay on workplace injuries (e.g. Bender and Ioannis, 2014) and on psychological stress in the workplace (e.g. Pouliakas and Theodossiu, 2009). This literature is often critical on the impact of PRP, maintaining that PRP (and in particular, individual PRP) leads to lower job satisfaction and thereby to more quits.

To sum up, there are conflicting predictions related to different PRP systems. Group PRP systems may be associated with *higher* employee turnover, if line of sight considerations dominate and employees view the pay system as confusing. On the other hand, group PRP systems may lead to *less* turnover if PRP leads to stronger employee identification with the firm (consistent with the gift exchange view). Also Group PRP systems may also lead into *less* turnover if they lead into more downward flexibility of wages. Similarly with individual PRP systems there are forces pushing the effect on employee turnover in different directions. Individual PRP systems may be associated with *lower* employee turnover if they align employees' expectations about the link between compensation and job tasks. However, individual PRP systems may lead into *higher* turnover if they lead into higher psychological and

physical stress. Also, by increasing pay variability, both types of PRP may increase turnover among risk-averse employees. In sum, theory is ambiguous as to the predicted net effects on separation for both individual and group PRP.

Moreover, in thinking about which of these *net* effects for individual and group PRP might be expected to dominate, predictions are further complicated by specific institutional arrangements in Finland. Based on previous evidence, (see e.g. Kalmi and Kauhanen (2006); Gooderham et al. (2015); and Jones et al. (2017)), we believe that the institutional framework might be an important determinant for employee outcomes (though this has been largely ignored in the context of worker turnover). Finland (and other CMEs) have compressed wage structures and industrial relations climates characterized as collaborative and trust intensive (e.g. Godard, 2004). By comparative international standards, the statutory protection of employee rights in Finland is robust and union density is very high (around 70% during the period of this study). This contrasts with LMEs where characteristically commitment and trust are low, and employment relationships are typically at arms' length. We hypothesize that the effects of PRP on worker turnover in these differing institutional environments can be expected to be dissimilar. For instance, the variance of pay introduced by PRP schemes can be expected to be lower in CMEs where union influence is prevalent; this may mean that any effects, either on work incentives or turnover intentions, can be rather curtailed in CMEs compared to LMEs. Also since different groups may perceive the costs and benefits of these institutional set-ups differently, the responses to PRP may also differ across actors such as blue and white collar workers.

Previous empirical analysis

The early studies on the effects of PRP on employee turnover were largely inspired by Weitzman's (1984) share economy hypothesis. The results indicated modest support for the

hypothesis, showing a negative relationship between the presence of profit-sharing and employee turnover, even though the precise mechanism remained unclear (Chelius and Smith, 1990; Kruse, 1992). Also later studies on the link between profit-sharing and employee separation have found this negative relationship (Azfar and Danninger (2001) and Green and Heywood (2011) using individual data from the US and the UK, respectively).

To our knowledge studies looking at the effects of individual PRPs on employee turnover are scarcer than those pertaining to collective PRP. The sorting effect described earlier is well known through Lazear's (1986; 2000) theoretical and empirical work. However, the effect on overall turnover is difficult to infer from sorting: while less productive employees may be induced to leave, this may be compensated by the higher likelihood of more productive employees remaining in the firm.

An early study on the effects of a type of PRP other than profit-sharing is Blakemore et al. (1987), who found that bonus payments reduced employee turnover. Two studies explicitly contrasting individual- and group level PRPs are Guthrie (2000) and O'Halloran (2012). The former is a rare study: a positive association between group level PRP and turnover is found, while individual-level PRP reduces turnover. Moreover, Guthrie (2000) finds that the positive (turnover-inducing) effect is increasing in group size. However, O'Halloran (2012) finds that profit-sharing is associated with less turnover, whereas other forms of PRP do not have a statistically significant association with turnover.

3. Data and Descriptive Statistics

Data

An attractive feature of our study is the use of matched firm-individual panel data, while earlier studies have been based either on firm-level data (Chelius and Smith, 1990; Kruse, 1992;

Guthrie, 2000) or individual-level data (Azfar and Danninger, 2001; Green and Heywood, 2011). Our register-based data are obtained from the Confederation of Finnish Industries (EK) payroll records for its member firms, which imply they are likely to be less-prone to various measurement errors (e.g. recall errors) that data used in previous studies may suffer from. Further, we can consider how much of worker earnings were actually based on these performance schemes—the intensive margin (Jones et al., 2017), while previous studies, by relying on survey-collected data, typically can only measure whether a worker has received any form of PRP (i.e. the presence of PRP sometimes called the extensive margin, Jones et al., 2017).[1]

As providing payroll information to the EK is voluntary for member firms with fewer than 30 persons, to avoid potential sample selection bias this may induce, we exclude these firms from our sample. Also excluded from the records is information on top management and on workers who are either owners of the firm or are relatives of these owners. The full data cover about 70 percent of all workers in manufacturing in Finland, and hence are representative of the population of Finnish workers in this sector. In terms of the overall Finnish economy, the EK's data account for about a third of all private sector workers in Finland (Uusitalo and Vartiainen, 2008). Most importantly, the data provide a unique source of information on *the type of compensation* (e.g. whether a worker in a given year has received some form of PRP). In addition, the data provide information on *worker characteristics* (e.g. job tenure, education, age, and employer identifiers), *job characteristics* (e.g. occupation and job schedules) and *firm characteristics* (e.g. firm size and firm performance).

We restrict our analysis to full-time manufacturing workers from 1997 to 2006, and undertake analyses for white-collar and blue-collar male workers separately.[2] While full-time white-collar workers receive a monthly salary, we use 30 hours per week as the cut-off for full-time blue-collar workers. To help to overcome problems introduced by high turnover of younger

workers and early retirement schemes for older workers, we confine our analysis to workers who are aged 25-53 years old. Importantly, our analysis is also restricted to male workers only since the proportion of female manufacturing workers in our sample is rather low-- 14% (22%) among white-collar (blue-collar) workers.[3] Also, as discussed later on, we cannot make a distinction between two types of turnover, namely job-to-job versus job-to-non-employment, and in understanding the turnover patterns of women, this feature has been shown to be quite important for women, and any analysis of turnover of female workers without distinguishing job-to-non-employment from job-to-job would be less useful (Royalty, l998).

Most previous studies identify worker exit events using measures that are derived from survey information on worker *intentions* to move (e.g. Sousa-Poza and Henneberg, 2004; Weisberg and Kirschenbaum, 1991). By contrast, we measure separations using *actual* changes in employer-worker matches, based on the employer firm ID code changes, from one year to the next.[4] In contrast to studies that assess inter-firm (or inter-industry) variations in separation rates using cross-sectional data, we follow actual job spells and switches of employees for a long time-period, specifically from 1997 to 2006. We also require that each firm exists at least three consecutive years in the data.

We recognize some limitations of our measure of worker separation. First, our data do not allow us to distinguish firm-initiated involuntary layoffs from worker-initiated voluntary quits. However, this is also a shortcoming of some previous studies (e.g. Böckerman and Ilmakunnas, 2009). We try to minimize the problem of voluntary vs. involuntary separations by focusing on full-time employees because, in Finland, these workers enjoy strong employment protection. And in the absence of severe economic downturns during the study period, we are reasonably confident that the bulk of separations are voluntary. In any event, on theoretical grounds, the distinction between layoffs and quits is also ambiguous because employers can always try to

hound their workers out of a job (e.g. by reducing worker wages, reallocating work-tasks, or providing generous severance payment for volunteer movers).[5] Another shortcoming is that we do not have information on the characteristics of workers' families such as partners' age, earnings and the number of children. Further, worker separation events in the sample may consist of job-to-job transitions within the data (to another EK firm) as well as out-of-job transitions (to outside of the data), but we do not make a distinction between these two exit channels in our models. One reason for this is that, in the latter case, a worker can move either to unemployment, or out of the labor force or to employment in non-EK firms (e.g., small firms or other sectors), but our data do not allow us to distinguish among these three different forms of transitions. Finally, we are unable to control for the effect of job satisfaction on worker separation due to data limitations, unless job dissatisfaction arises from inter-firm wage inequality, job characteristics, level of earnings, job scheduling hazards, or worker age and tenure. We also use in our estimations firm fixed effects to control for firm (time-invariant) characteristics such as management expertise and HRM systems, each of which might have bearings on job satisfaction.

The most important and novel aspect of this study, however, is our ability to analyze whether two specific forms of PRP, namely group incentive (GI) pay and individual incentive (II) pay, after controlling for a rich set of important covariates, have different implications for worker separation in a coordinated market economy. The classifications of the specific pay schemes we investigate are based on our conversations with EK's experts, our reading of EK's PRP publications as well as our prior knowledge gleaned from studies of PRP in Finnish companies (e.g. Jones et al., 2006; Jones et al., 2010a; Jones et al., 2010b; Jones et al., 2012; Jones et al., 2017; Kalmi and Sweins, 2010). *Profit Sharing* in Finland is similar to profit sharing in other countries such as the U.S. and Japan (see, for example, Kruse, 1992 for the U.S. and Kato and Morishima, 2003 for Japan). It is a group incentive pay scheme linking individual worker's pay

to firm-level performance, typically profit. As in the case of U.S. profit sharing, profit sharing in Finland can be either a cash plan (paid in cash to individual workers) or a deferred plan (contributed to the personnel fund). In our data we only have information on the former. This scheme is clearly a group incentive pay scheme.

Gainsharing in Finland is typically not negotiated in collective agreements and is set by management. In other words, firms can unilaterally decide the adoption of gainsharing, without union involvement. Perhaps the most common example is an annually-paid cash bonus scheme. Its amount is often determined by how well performance targets are reached or surpassed. The targets are typically set at the group or unit-level. Amongst upper-white collar workers, in some cases, the group-level performance measures may have been complemented with the individual-level performance measures (e.g. how well an individual project has succeeded). However, our understanding is that gainsharing schemes with *only* the individual-level performance measures were highly atypical, if any, in the sample period. Compared to profit sharing performance can be measured at a more local level, as in the case of most gainsharing plans in the U.S. and other advanced market economies. Gainsharing is largely a group incentive pay scheme.

Piece Rates is traditionally a payment scheme used when an individual worker's output can be measured rather easily and accurately. Usually a worker's pay is proportional to the quantity of output he produces. Not too surprisingly, piece rates are only used among blue-collar workers in our data. It is mostly an individual incentive pay scheme although in Finland it is possible that in some cases piece rates include a scheme making a minor part of worker's pay proportional to the quantity of output produced by her and her colleagues in the same work unit such as team. This scheme is largely an individual incentive scheme.

Finally, *Reward Pay* is similar to piece rates. It is mostly based (partly or fully) on individual performance rather than individual workload. Examples of performance measures

include quantity of work (quantity reward), quality of work (quality reward) or some other performance measure at the individual level. As such, it is typically an individual incentive pay scheme. Sales commissions and production bonuses are examples of reward pay. Reward pay is common in paper and technology industries. As shown below, reward pay is much more common amongst blue-collar workers. This scheme is mostly an individual incentive scheme.

Our individual-level data on worker and job characteristics provide information on several important covariates. We can control for Sunday overtime and Shift work which traditionally have been viewed as important dimensions of undesirable work schedules or job scheduling arrangements; both equal one if a worker has received Sunday overtime and/or a shift work payment in a given year and zero otherwise. Rather unusually in the literature on separation, we also are able to include the standard deviation of worker annual earnings within-firm as a control for intra-firm wage dispersion, a potential source of job dissatisfaction, calculated separately for white-collar and blue-collar worker groups within the firm.[6]

To deal with unobserved heterogeneity across firms (such as management expertise and HRM systems), we include firm fixed effects as controls. Also we use a broad set of industry and occupational dummy variables to account for differences in adverse workplace conditions across industries and occupations, separately for white-collar and blue-collar workers. Also in Finland working conditions are largely regulated by collective agreements between employee and employer representatives along industrial lines. For white-collar workers we use 24 and for blue-collar workers 30 manufacturing industry dummies. While industry and occupational dummy variables may not fully capture adverse conditions, this may not be an issue here due to the availability of a strong voice option through a high-level of unionization over a long period in Finland, suggesting Finnish workers under adverse workplace conditions are more likely to choose the voice option first rather than the exit option. Hence we expect worker separations in

Finland to be less sensitive to adverse workplace conditions and worker discontent than in countries with low-levels of unionization (for the exit-voice theory of trade unions, see Freeman (1980) and Freeman and Medoff (1984)). We also note that related empirical work has tended to focus on countries in which unionization rates are far from "high" (such as the U.S. or the U.K.). By contrast, since the late 1960s in Finland unionization rates have been around 70-80% and collective agreements between employer' and employee' representatives have covered about 90% of the workforce. Moreover, collective bargaining and centralized income agreements are usually also binding for nonunion workers. These "co-ordinated market" features of the Finnish labor market (especially when compared with the much more LMEs of the U.S. and the U.K.) provide an interesting environment to assess the impact of PRP on worker separation.

Similarly, we use the formal level of education to account for the heterogeneity of workers in their education.[7] We also take into account firm type and perform regressions for large (employment>100) and small firms (employment<100) separately. To account for the impact of differences in local labor market conditions on quit behavior, we use annual regional unemployment rates. To control for time-invariant differences across regions (i.e. Southern, Western, Eastern, Lower North, and Upper North provinces), we also include regional fixed effects as controls.

Descriptive statistics

Table 1 reports summary statistics for key variables for white-collar male workers. The overall number of white-collar male workers in the data consists of 1,187,583 worker-year observations, or 218,630 workers. A small number of workers with multiple job spells within a year were excluded. After dropping anyone who does not meet any one of our three inclusion criteria (full-time; age 25-53; and working in firms with 30 or more employees), our final sample

for white-collar workers consists of 229,117 worker-year observations, or 58,749 workers. The unconditional separation rate (sample mean) is 0.12. The average size of (realized) group incentive pay is about 5% of worker annual total earnings, or about 2,250 euros. In turn the incidence of group incentive pay is 0.57. Concerning undesirable work schedules, the incidence of Sunday overtime work is more common than shift work.

Table 2 reports summary statistics for blue-collar male workers. The overall number of blue-collar male workers consists of 2,070,940 worker-year observations, or 389,227 workers. After dropping anyone who does not meet any one of our three inclusion criteria (full-time; age 25-53; and working in firms with 30 or more employees) we end up with 340,344 worker-year observations, or 80,338 workers. The unconditional separation rate (sample mean) is 0.17, implying somewhat larger separation risk than for white-collar workers. Reassuringly our numbers for white-collar and blue-collar male worker separation are in line with previous findings for Finland – for example, Theodossiou and Zangelidis (2009) found about a 14% probability for men of moving either to another job or non-employment. The average size of group incentive pay is close 4% of worker annual total earnings, or about 1,000 euros. More importantly, the average size of individual incentive pay is 16.6% of worker total annual earnings, or about 4,700 euros. The incidence of group incentive pay is 0.17, while the incidence of individual incentive pay is 0.39.[8] With an incidence rate about 0.85, undesirable work schedules are common among blue-collar workers. Comparing between Tables 1 and 2 also reveals that blue-collar workers in the sample are less educated than white-collar workers.

4. Empirical strategy

To motivate our empirical analysis, we follow Frederiksen (2009). In a standard model of job separations and labor market flows the value of an employment match is a function of an individual's characteristics (e.g. age, education), job factors (e.g. undesirable work schedules, occupation, PRP) and firm characteristics (e.g. employer size, earnings inequality, firm performance, industry). The value of the current employment match (V_{it}^{C}) can be characterized as follows:

(1) $V_{it}^{C} = f^{C}\left(W_{it}, J_{it}^{C}, F_{it}^{C}, \varepsilon_{it}^{C}\right)$,

where W_{it} is the vector of individual worker characteristics, J_{it}^{C} is the vector of job factors, F_{it}^{C} is the vector of firm characteristics and ε_{it}^{C} is a random component (i.e. the value of the match is not known with certainty). Superscript *C* refers to the worker's current employer. Within the current job spell in *t*-1, in subsequent period *t* the worker has an option to continue with the current match or to separate. If we assume that the worker separates and starts work for an alternative employer (*A*), the alternative employer may value worker characteristics (W_{it}) differently from the current employer (*C*). Likewise, job factors and firm characteristics are likely to differ between the current and the alternative employer (e.g., we might write $J_{it}^{A} = x' J_{it}^{C}$ and $F_{it}^{A} = z' F_{it}^{C}$). This implies that the value of the alternative match differs from the value of the current match ($V_{it}^{A} = f^{A}\left(W_{it}, J_{it}^{A}, F_{it}^{A}, \varepsilon_{it}^{A}\right) \neq V_{it}^{C}$). Since initially the worker has decided to work for the current employer, it must be the case that $V_{it}^{C} > V_{it}^{A}$. However, changes in the arguments of f^{C} in subsequent periods might make the alternative employment match economically more attractive for the worker. In this case, $V_{it}^{A} > V_{it}^{C}$ and the worker separates from his current employment match.

We apply the linear probability model (LPM) for the conditional probability that worker *i* separates from firm *j* in year *t*, given that worker employment match has lasted until the end of the previous year *t-1*. We use the LPM approach (rather than potential alternative empirical approaches such as probit) for the reasons discussed in Bellemare et al. (2015). First, as discussed above below, controlling for a large number of firm fixed effects is of importance in our estimations. The use of nonlinear procedures in our context makes the results vulnerable to the incidental parameter problem. Second, we use robust standard errors to account for heteroscedasticity, a shortcoming of LPM. Third, LPM avoids identification by the specific functional forms that nonlinear procedures assume. Our main focus is on how the probability of worker separation in year *t* is associated with the incidence of PRP in year *t-1*. For blue-collar workers our measure of PRP includes both individual incentive pay and group incentive pay, while for white-collar workers PRP contains only group incentive pay. We restrict our empirical analysis to the first separation event to avoid complications of multiple separations of same worker in estimations. In short, we model a conditional probability for the termination of single job spell. Because worker observations within the same firm may be correlated, standard errors are clustered at the firm level.

For white-collar workers we estimate the following linear probability model for a conditional probability of worker separation:

$$(2)\quad P(Y_{i,t}^{WC}=1\mid X_{t-1}^{WC})=\beta_0^{WC}+\alpha_1 GI_{i,t-1}^{WC}+\beta_1 X_{i,t-1}^{WC}+\beta_2 FIRM\_FE_{j,t-1}^{WC}+\beta_3 YEAR\_FE_{t-1}^{WC}+\varepsilon_{i,t}^{WC}$$

In Eq. (2) the dependent variable, $Y_{i,t}^{WC}$, equals one if the white-collar male worker *i* separates from his current job match year *t*, 0 otherwise. Our key focus in Eq. (2) is on α_1, which measures the association between the incidence of group incentive pay year *t-1* and the separation event in next year *t*, conditional on a broad set of one-year lagged covariates year. Reflecting our earlier

discussion, the vector $X_{i,t-1}^{WC}$ includes controls for *worker characteristics* (age categories, formal level of education, earnings quartile within the firm), *job characteristics* (dummies for job scheduling hazards, 3-digit occupational dummies, job tenure in year 1997), *firm characteristics* (industry, size (6 categories), earnings inequality (within firm standard deviation of worker earnings), and *regional characteristics* (regional dummies and annual regional unemployment rate (%)). Firm fixed effects ($FIRM\_FE_{j,t-1}^{WC}$) are included to capture time-invariant heterogeneity across firms (e.g. persistence in firm productivity and managerial practices). Year dummies ($YEAR\_FE_{t-1}^{WC}$) control for macroeconomic effects that are common to all white-collar workers.

For blue-collar workers we modify Eq. (2) to include the incidence of individual incentive pay ($II_{i,t-1}^{BC}$). Specifically, we estimate the following linear probability model for a conditional probability of blue-collar male worker separation in year *t*:

(3)

$$P(Y_{i,t}^{BC} = 1 \mid X_{t-1}^{BC}) = \beta_0^{BC} + \alpha_1 GI_{i,t-1}^{BC} + \alpha_2 II_{i,t-1}^{BC} + \beta_1 X_{i,t-1}^{BC} + \beta_2 FIRM\_FE_{j,t-1}^{BC} + \beta_3 YEAR\_FE_{t-1}^{BC} + \varepsilon_{i,t}^{BC}$$

In Eq. (3) our dependent variable, $Y_{i,t}^{BC}$, equals one if the worker separates in year *t* from his job match year *t*-1, 0 otherwise. Our interest lies in the parameters of $GI_{i,t-1}^{BC}$ and $II_{i,t-1}^{BC}$, i.e. α_1 and α_2. The vector of one-year lagged covariates included in Eq. (2) is as in Eq. (1). Because there can be important differences in worker separation across small and large firms, we also estimate Eq. (2) and Eq. (3) separately for small (employment <100) and large (employment>100) firms. This definition for small firms was used in prior studies such as Sauermann (2017).

5. Findings

Table 3 reports our key findings for white-collar worker separation under incentive pay, after controlling for heterogeneity across workers, jobs and firms. Our key focus is on whether group incentive pay (measured as % of the worker annual total earnings) in the previous year (*t*-1) is associated with worker separation in the subsequent year (*t*).

In column (1), for the full sample of firms, we find a positive and statistically significant association (10% level) between worker separation and group incentive pay. The estimated coefficient on group incentive pay, 0.002, indicates that a 10-percentage-point increase in the share of group incentive pay is associated with about a 2 percentage points (pp) *greater* risk of separation.

Turning to other explanatory variables in column (1), we find that the estimated coefficient of earnings inequality is positive but insignificantly associated with worker separation. The odds of separation for workers in the fourth quartile of the earnings distribution are found to be not significantly different from workers in the third quartile. However, workers belonging to the first (second) quartile of the firm earnings distribution are 1.1 pp (0.5 pp) more likely to separate than workers in third quartile, both at the 1% significance. Given that quartiles of the firm earnings distribution also reflect differences in employee's marginal product of labor, this implies a greater risk of separation for lower productivity workers. Both measures of undesirable work conditions are negatively associated with worker separation. The estimates of Sunday overtime work and shift work are both negatively (-0.009) significant at the 5% level. We interpret this negative association as evidence of compensating differentials.

Compared with prime-aged workers 40-44 years old, workers in the 30-34 and 35-39 years old age-groups have a strongly statistically significant and positively association with separation. For example, the parameter estimate for the former group implies about a 2.0 pp

greater risk of separation, while for workers in the latter group the separation risk is about 1 pp. greater, while the separation risk for workers 45-49 years old is about 0.7 pp lower. The oldest group of workers 50-53 years old is consistently associated with about 19 pp greater risk of separation at the 1 % level. The association between educational level and separation is positively significant for primary-level education as well as for bachelor-level or above (compared with the reference group of tertiary-level educated workers). For example, workers with primary-level and masters-level education are associated with an enhanced risk of separation (by about 2 pp). For highly-educated workers, this finding is consistent with skill-biased technological change (e.g. Autor et al. 1998).

In columns (2)-(3) we split the white-collar sample by employer size (cut-off is 100 workers) and report findings for small and large firms separately. Concerning group incentive pay, we continue to find that group incentive pay is positively associated with worker separation, but only in large firms. The size of the parameter estimate is 0.002 and it is significant at 10% level. This is consistent with the argument that that the line of sight – issues might be more pronounced in larger organizations, where profitability is largely outside the influence of typical employees.

For other covariates the findings in columns (2) and (3) show some striking differences compared to the findings reported for the full sample of firms in column (1). For example, we find a positive association (0.3) between earnings inequality and separation in small firms at the 1% level (column 2), but not in large firms in (column 3). The positive association with worker separation is consistent with those who argue (e.g. Cohn et al., 2015) that sizeable wage inequality can be a source of worker job dissatisfaction and hence may result in greater separations. Indeed our findings suggest that the inequality-dissatisfaction link has an even greater weight in small than in large firms. Interestingly, Sunday overtime time work

(undesirable work schedules) is associated with a reduced separation risk for small firms (column 2), but not for large firms (column 3).

Finally, we undertake some robustness checks. In one set of exercises, we estimate columns (1)-(3) using individual worker total earnings instead of within-firm earnings quartiles. In a second set of exercise we exclude the earning-inequality variable. Finally, in a third set of exercises, in order to distinguish between voluntary and involuntary separation, we add a measure of firm performance (i.e. one-year lagged annual growth rate of total amount of earnings paid by firm). In all cases, the findings (not reported here but available upon request) remain qualitatively the same.

[TABLE 3 ABOUT HERE]

Table 4 reports findings for blue-collar workers. In contrast to white-collar workers, for blue-collar workers we observe both group incentive pay and individual incentive pay in our sample. In column (1), where we look at the full sample of firms, we find a negative association between separation and individual incentive pay (measured as % of the worker annual earnings). The estimated coefficient (-0.001) is statistically significant at the 1% level. This finding is in line with our prior expectations as individual incentive scheme is typically used when worker's output can be measured rather easily and accurately, and thus employees know well what is expected of them in terms of output. The estimated coefficient on individual incentive pay, -0.001, indicates that a 10-percentage-point increase in individual incentive pay is associated with about 1 pp *decrease* in the risk of separation.

In columns (2)-(3) we again split our blue-collar sample by employer size (cut-off is 100 workers) and report findings for small and large firm separately. Concerning group incentive pay in columns (2) and (3), we continue to find, both for small and for large firms, an insignificant

association with worker separation. In a similar vein, in columns (2) and (3) we continue to find that individual incentive pay reduces significantly a risk of separation and thus enhances employment stability in small and large firms. The parameter estimate is -0.002 for small firms (col.(2)) and -0.001 for large firms (col.(3)). The size of each parameter estimate indicates that a 10-percentage-point increase in the relative size of individual incentive pay is associated with a lower of separation (about 2 pp in small firms and about 1 pp in large firms).

For other covariates, in columns (1)-(3), earnings inequality is insignificantly associated with separation. Concerning earning quartiles, workers in the first and second quartiles are about 0.7 pp more likely to separate than workers in the reference category (Q_3); for small firms this effect seems to be somewhat more sizeable (about 1.3 pp in column (2)) than for large firms (0.5 and 0.7 for workers in the first and second quartiles respectively in column (3)). On the other hand, workers in the highest earnings quartile (Q_4) are about -1.0 pp less likely to separate at 1% significance level (compared to ref. category Q_3). Undesirable work schedules are negatively significant. For example, in column (1), Sunday overtime work is associated with a 2.3 pp and shift work a 1.1 pp reduction in separation risk, both at the 1% significance level. Compared to prime-aged workers 40-44 years old, age-groups 30-34 and 35-39 years old are positively associated with separation at 1% level in column (1). The parameter estimate for the former group implies about 2 pp greater risk of separation, while for the latter separation risk is about 1% smaller. The oldest group of workers (50-53 years old) is associated with about a 17 pp greater risk of separation at the 1 % level. These findings are qualitatively similar for small and large firms reported in columns (2) and (3); they are also substantially similar to those reported earlier for white-collar workers in Table 3. The association between educational level and separation is positively significant for all levels of education in columns (1)-(3). Hence, irrespective of employer size, compared with the reference group (tertiary-level education), low- and highly-

educated workers are associated with an enhanced risk of separation. However, compared to large firms, workers with a bachelor-level (or above) education face about 4 pp higher risk of separation in small firms, while for workers with primary-level education the separation risk is about 1 pp (1.7 pp) greater in small (large) firms, both at the 1% significance level.

Finally, as robustness checks, we undertake various supplementary exercises. Two auxiliary regressions mirror those undertaken for white-collar workers – first we use individual worker total earnings instead of within-firm earnings quartiles, and second we add a measure of firm performance in order to distinguish between voluntary and involuntary separation. The findings (not reported here but available upon request) are qualitatively unchanged. To deal with the potential problem posed by blue-collar workers who receive both individual (II) and group incentive (GI) pay, in the third regression we add a measure of combined individual and group incentive pay (as % of the worker annual earnings). We continue to find that group incentive pay is insignificant. The size of individual incentive pay estimate is unchanged. Interestingly, we find that combined incentive pay (II&GI) is negatively significant (-0.001) at the 10 % level. For small firms, the results are qualitatively intact for individual and group incentive pay, while combined incentive pay is highly insignificant. For large firms, the findings are qualitatively similar as those for all firms discussed above.

[TABLE 4 ABOUT HERE]

6. Conclusions and Implications

Theory is ambiguous as to the expected *net* effects of different forms of PRP on worker separation. In addition, there is reason to believe that institutional context matters and that the effects of PRP in CMEs will differ from those in LMEs. By using a large longitudinal data set for full-time white-collar and blue-collar male workers in Finland, we are able to provide fresh

evidence on the association between worker separation and PRP. These register-based data enable us to generate the most rigorous evidence to date on the association between worker separation and *specific* forms of PRP, namely individual incentive pay and group incentive pay. Our findings reflect our focusing on two different occupational groups. Also, to account for possible heterogeneous effects on separation of PRP among different types of workers, we control for the formal level of education and occupation as well as time-invariant heterogeneity across firms (productive firms may simply pay their employees more than less-productive firms, which may decrease worker turnover).

The key finding for white-collar male workers is that group incentive pay is associated significantly with *increased* probability of separation and hence *diminished* employment stability, but in large firms only. This finding is consistent with arguments based on line of sight and free riding arguments: more distant measures are regarded as more difficult to influence and hence the link from effort to reward is unclear. Also the larger the team is, the less motivating the measures are. However, our findings are inconsistent with much of the recent literature stressing gift exchange and higher commitment coming from profit-sharing systems. Our findings are also inconsistent with much of the empirical literature that has tend to find employment stabilizing influence from profit-sharing (e.g. Green and Heywood, 2011; O'Halloran, 2012). However, our results are consistent with the results of Guthrie (2000), who also found that employee turnover was higher under group PRP and that the separation effect of group PRP is more pronounced in larger firms.

For blue-collar male workers our findings reveal a different story. Our results consistently indicate that individual incentive pay is associated with a *decreased* probability of separation and hence *enhanced* employment stability, both in small and large firms. As such, the finding is again consistent with the line of sight argument: a clear connection between effort and reward enhances

job satisfaction and hence reduces quits. In contrast, the findings are inconsistent with the arguments that individual level PRP increases work related stress in a CME. Empirically, our findings are consistent with the arguments of Blakemore et al. (1987) and Guthrie (2000). Furthermore, our findings of increased separation for white-collar workers versus lower separation for blue collar workers under PRP are consistent with white collar workers experiencing greater stress in CMEs than do blue collar workers—additional evidence that in accounting for differences in empirical findings across various settings, our results suggest that outcomes depend on the differing institutional contexts found in CMEs and LMEs.

Our investigations also reveal a number of interesting findings concerning other covariates. Earnings inequality is associated with an increased risk of separation for white-collar workers in small firms. Thus for some white-collar workers this finding provides evidence in support of the power of the fair wage hypothesis, but no such evidence is found for blue collar workers. One potential explanation for this finding is the role of institutional context-- white-collar worker earnings are less compressed than blue-collar worker earnings in CMEs such as Finland. Education is found to influence separation for both groups of workers. As such these findings provide some support for both the role of skill biased technical change and the idea of job polarization. Consistent with the notion of compensation wage differentials we find that undesirable work schedules are always associated with a reduced risk of separation. Consistent with several economic studies who find a higher risk of unemployment for older workers (e.g. Kyyrä and Wilke 2007), we find a significantly higher risk of separation for older workers.

We recognize potential limitations in our study. Even though we use longitudinal data and, compared to most other pertinent studies, a very large number of observations, we are not easily able to distinguish firm-initiated involuntary layoffs from worker-initiated voluntary quits. However, we try to minimize the problem by focusing on full-time prime-aged male employees

during a period with no severe economic downturns. Also, in Finland these full-time workers enjoy strong employment protection, and in the absence of severe economic downturns during the study period, we are reasonably confident that the bulk of separations are voluntary. Also one of our robustness exercises introduced a measure of firm performance as a control variable and findings were essentially unaffected. In addition, we account for differences across the regions that firms operate in by including regional unemployment rates as well as region fixed effects as controls. Further, we exclude all worker-year observations of firm disclosure year from our sample. We also stress that, on theoretical grounds, the distinction between layoffs and quits is ambiguous because employers can always try to hound their workers out of a job. Further, we are unable to disaggregate worker transitions to outside of the data into three distinct destinations: unemployment, out of labor force, and non-EK firms (e.g., small firms or other sectors). Also we do not have information on the characteristics of workers' families such as partners' age, earnings and the number of children. However, while we may have been unable to fully mitigate these limitations, we believe our data allow us to control for the key determinants of separation.

In some European countries (for instance, the UK), fiscal incentives have been used to promote group PRP, such as profit-sharing, and employment stability has been cited as one of the reasons for the introduction of such policies. In that case, policymakers ought to be cognizant that: (i) not all PP is created equal---individual incentive pay and group incentive pay may affect employment stability differently; and (ii) not all workers are affected by PP equally---white-collar and blue-collar workers respond to performance pay differently. Our study does not lend support for fiscal incentives for profit-sharing at least on the grounds of reducing turnover. In turn, fiscal incentives have rarely been used to promote individual PRP.

Finally, the study does not reveal the mechanism why group-based PRP was associated with higher employee turnover in a CME, and this could usefully be addressed in a further study.

If line-of-sight issues are the main channel, then managers could possibly improve the situation by simplifying group PRP systems, and improving communication about their features. Of course, a full consideration of these issues would also require a careful consideration and balancing of other impacts that payment systems may have.

Table 1. Summary Statistics for White-Collar Workers

	(1) Mean	(2) Std. Dev.	(3) Min	(4) Max
Worker separation (0/1)	0.115	0.319	0	1
Performance Pay				
Group Incentive Pay (% of worker annual earnings if Group Incentive Pay>0)	5.14	4.49	0.001	82.83
Group Incentive Pay (€) (if Group Incentive Pay>0)	2,238	2,641	0.880	105,946
Incidence of Group Incentive Pay (0/1)	0.582	0.493	0	1
Annual real earnings (€)	37,963	12,245	12,879	188,138
Log(annual real earnings)	10,50	0.295	9.46	12.14
Undesirable work schedules				
Sunday overtime work (0/1)	0.352	0.477	0	1
Shift work (0/1)	0.108	0.311	0	1
Worker age				
25-29 years	0.084	0.277	0	1
30-34 years	0.170	0.376	0	1
35-39 years	0.185	0.388	0	1
40-44 years	0.184	0.387	0	1
45-49 years	0.180	0.384	0	1
50-53 years	0.197	0.398	0	1
Worker educational level				
Primary, 6-9 years or missing	0.059	0.235	0	1
Upper secondary, 11-12 years	0.169	0.374	0	1
Lowest tertiary, 13-14 years	0.299	0.458	0	1
Bachelor, 14-16 years	0.271	0.445	0	1
Master or above, 16-23 years	0.202	0.402	0	1
Employer size				
30-49 employees	0.052	0.222	0	1
50-99 employees	0.142	0.349	0	1
100-249 employees	0.252	0.434	0	1
250-499 employees	0.184	0.387	0	1
500-999 employees	0.141	0.348	0	1
>1000 employees	0.229	0.420	0	1
Number of firms	565			
Number of workers	58,749			
Number of observations	229,117			

Source: Linked Employer-Employee Data from the EK

***Notes**:* Summary statistics are based on the underlying white-collar male sample, except employer size that is constructed using full white-collar sample (i.e. including both female and male workers) to measure more accurately employer size. All figures in the table present unconditional sample means (unless indicated otherwise) over the pooled data 1997-2006 that are used in the estimations. Earnings are in real terms (deflated by the CPI deflator).

Table 2. Summary Statistics for Blue-Collar Workers

	(1) Mean	(2) Std. Dev.	(3) Min	(4) Max
Worker separation (0/1)	0.145	0.352	0	1
Performance Pay Group Incentive Pay (% of worker annual earnings if Group Incentive Pay>0)	4.19	3.19	0.003	42.39
Individual Incentive Pay (% of worker annual earnings if Individual Incentive Earnings>0)	16.35	4.82	0.003	45.47
Group Incentive Pay (€) (if Group Incentive Pay>0)	1,024	822	1	12,867
Individual Incentive Pay (€) (if Individual Incentive Pay>0)	4,659	1,251	1	14,270
Incidence of Group Incentive Pay (0/1)	0.164	0.370	0	1
Incidence of Individual Incentive Pay (0/1)	0.393	0.488	0	1
Incidence of both Group and Individual Incentive Pay (0/1)	0.249	0.432	0	1
Annual real earnings (€)	28,868	6,595	11,183	82,675
Log(annual real earnings)	10.24	0.23	9.32	11.32
Undesirable work schedules Sunday overtime work (0/1)	0.853	0.354	0	1
Shift work (0/1)	0.855	0.352	0	1
Age category 25-29 years	0.106	0.308	0	1
30-34 years	0.153	0.360	0	1
35-39 years	0.167	0.373	0	1
40-44 years	0.181	0.385	0	1
45-49 years	0.200	0.400	0	1
50-53 years	0.192	0.394	0	1
Educational level Primary, 6-9 years or missing	0.262	0.440	0	1
Upper secondary, 11-12 years	0.696	0.460	0	1
Lowest tertiary, 13-14 years	0.037	0.189	0	1
Bachelor or above, 14- years	0.005	0.068	0	1
Employer size 30-49 employees	0.039	0.194	0	1
50-99 employees	0.107	0.309	0	1
100-249 employees	0.234	0.424	0	1
250-499 employees	0.209	0.406	0	1
500-999 employees	0.170	0.375	0	1
>1000 employees	0.241	0.428	0	1
Number of firms	660			
Number of workers	80,338			
Number of observations	340,344			

Source: Linked Employer-Employee Data from the EK

***Notes**:* Summary statistics are based on the underlying blue-collar male sample, except employer size that is constructed using full blue-collar sample (i.e. including both female and male workers) to measure more accurately employer size. All figures in the table present unconditional sample means (unless indicated otherwise) over the pooled data 1997-2006 that are used in the estimations. Earnings are in real terms (deflated by the CPI deflator).

Table 3. Worker Separation under Performance Pay: White-Collar Workers

	(1) All firms	(2) Small firms (emp.<100)	(3) Large firms (emp.>100)
Group Incentive Pay (as of Worker Annual Total Earnings, %)	0.002 * (0.001)	0.001 (0.001)	0.002 * (0.001)
Earnings Inequality	0.180 (0.129)	0.291 *** (0.108)	0.108 (0.204)
Worker Earnings Quartile (ref. Q3)			
Q1	0.011 *** (0.003)	0.008 (0.005)	0.011 *** (0.004)
Q2	0.005 *** (0.002)	0.000 (0.004)	0.006 *** (0.002)
Q4	0.003 (0.003)	0.007 * (0.004)	0.003 (0.003)
Undesirable work schedules			
Sunday overtime work (0/1)	-0.009 ** (0.005)	-0.013 ** (0.006)	-0.008 (0.005)
Shift work (0/1)	-0.009 ** (0.004)	-0.014 ** (0.006)	-0.008 ** (0.004)
Worker age (ref. 40-44 years)			
25-29 years	0.004 (0.004)	0.010 * (0.006)	0.002 (0.005)
30-34 years	0.020 *** (0.003)	0.028 *** (0.005)	0.018 *** (0.004)
35-39 years	0.009 *** (0.002)	0.012 *** (0.004)	0.008 *** (0.002)
45-49 years	-0.007 *** (0.002)	-0.010 *** (0.003)	-0.008 ** (0.003)
50-53 years	0.194 *** (0.003)	0.186 *** (0.005)	0.195 *** (0.004)
Worker educational level (ref. lowest tertiary, 13-14 years) Primary, 6-9 years or missing	0.019 *** (0.003)	0.009 * (0.005)	0.021 *** (0.003)
Upper secondary, 11-12 years	-0.001 (0.002)	0.004 (0.003)	-0.002 (0.003)
Bachelor, 14-16 years	0.004 ** (0.002)	0.009 ** (0.004)	0.003 (0.002)
Master or above, 16-23 years	0.021 *** (0.003)	0.023 *** (0.005)	0.020 *** (0.004)
Adjusted R^2	0.173	0.215	0.171
Number of firms	565	409	239
Number of workers	58,749	13,177	48,658
Number of observations	229,117	44,367	184,750

Source: Linked Employer-Employee Data from the EK

***Notes**:* Estimates are based on the linear probability models for male workers for 1997-2005. The dependent variable (0/1) equals one if the worker separates in the year *t* from the firm s/he worked in the previous year *t-1*, and zero otherwise. Standard errors in parentheses are adjusted for clustering at the firm level. Significance levels: * 10%; ** 5%; *** 1%, respectively. Earnings Inequality is the within-firm standard deviation of worker earnings in a given year. Worker Earnings Quartile is the within-firm worker earnings quartile in a given year. All models also include a constant term, 23 industry dummies, year dummies, worker job tenure in 1997 (to control for the length of worker tenure prior to 1997), 5 regional dummies, firm dummies (fixed effects), 6 employer size dummies, 3-digit occupational groups and annual regional unemployment rates (%). All included covariates are one-year lagged.

Table 4. Worker Separation under Performance Pay: Blue-Collar Workers

	(1) All firms	(3) Small firms (emp.<100)	(3) Large firms (emp.>100)
Group Incentive Pay (as of Worker Annual Total Earnings, %)	0.001 (0.002)	-0.001 (0.002)	0.001 (0.003)
Individual Incentive Pay (as of Worker Annual Total Earnings, %)	-0.001 *** (0.000)	-0.002 *** (0.000)	-0.001 ** (0.000)
Earnings Inequality	0.063 (0.060)	0.030 (0.046)	0.066 (0.092)
Worker Earnings Quartile (ref. Q3)			
Q1	0.007 ** (0.003)	0.013 *** (0.005)	0.005 * (0.003)
Q2	0.007 *** (0.002)	0.013 *** (0.004)	0.007 *** (0.002)
Q4	-0.008 *** (0.002)	-0.010 *** (0.004)	-0.008 *** (0.003)
Undesirable work schedules			
Sunday overtime work (0/1)	-0.023 *** (0.004)	-0.010 ** (0.005)	-0.023 *** (0.004)
Shift work (0/1)	-0.011 *** (0.004)	-0.005 (0.005)	-0.014 *** (0.004)
Worker age (ref. 40-44 years)			
25-29 years	0.002 (0.002)	0.004 (0.005)	0.002 (0.002)
30-34 years	0.019 *** (0.002)	0.023 *** (0.005)	0.019 *** (0.002)
35-39 years	0.008 *** (0.002)	0.009 *** (0.004)	0.007 *** (0.002)
45-49 years	-0.004 ** (0.002)	0.001 (0.004)	-0.004 ** (0.002)
50-53 years	0.174 *** (0.002)	0.174 *** (0.004)	0.173 *** (0.002)
Worker educational level (ref. upper secondary, 11-12 years) Primary, 6-9 years or missing	0.016 *** (0.002)	0.009 *** (0.003)	0.017 *** (0.002)
Lowest tertiary, 13-14 years	0.015 *** (0.003)	0.019 ** (0.009)	0.015 *** (0.004)
Bachelor or above, over 14 years	0.040 *** (0.010)	0.071 *** (0.027)	0.034 *** (0.010)
Adjusted R^2	0.154	0.190	0.154
Number of firms	660	406	326
Number of workers	80,338	14,291	68,587
Number of observations	340,344	49,867	290,477

Source: Linked Employer-Employee Data from the EK

***Notes**:* Estimates are based on the linear probability models for male workers for 1997-2005. The dependent variable (0/1) equals one if the worker separates in the year *t* from the firm s/he worked in the previous year *t-1*, and zero otherwise. Standard errors in parentheses are adjusted for clustering at the firm level. Significance levels: * 10%; ** 5%; *** 1%, respectively. Earnings Inequality is the within-firm standard deviation of worker earnings in a given year. All models also include a constant term, 23 industry dummies, year dummies, worker job tenure in 1997, 5 regional dummies, firm dummies (fixed effects), 6 employer size dummies, 3-digit occupational groups and annual regional unemployment rates (%). All included covariates are one-year lagged.

References

Akerlof, G. A. (1982). Labor contracts as partial gift exchange. *The Quarterly Journal of Economics*, *97*(4), 543-569.

Azfar, O. and Danninger, S. 2001. 'Profit sharing, employment stability and wage growth.' *Industrial and Labor Relations Review* 54: 619-630.

Autor, D., Katz. L. and Krueger, A. 1998. 'Computing Inequality: Have Computers Changed the Labor Market?' *Quarterly Journal of Economics* 113(4): 1169-1214.

Bellemare, M. F., Novak, L., & Steinmetz, T. L. (2015). All in the family: Explaining the persistence of female genital cutting in West Africa. *Journal of Development Economics*, *116*, 252-265.

Blakemore, A.E., Low, S.A. and Ormiston, M.B. 1987. 'Employment bonuses and labor turnover.' *Journal of Labor Economics* Vol. 5 Nos 4, Part 2: S124-135.

Bender, Keith A. and Theodossiou Ioannis. 2014. 'The unintended consequences of the rate race: the detrimental effects of performance pay on health.' *Oxford Economic Press* 66: 824-847.

Booth, A. L., Francesconi, M. and Garcia-Serrano, C.G. 1999. 'Job tenure and job mobility in Britain.' *British Journal of Industrial Relations* 53: 43-70.

Böckerman, P. and Ilmakunnas, P. 2009. 'Job Disamenities, Job Satisfaction, Quit Intentions, and Actual Separations: Putting the Pieces Together.' *Industrial Relations* 48(1): 73-96.

Bryson, A., Freeman, R. B., Lucifora, C., Pellizzari, M. and Perotin, V. 2012. 'Paying For Performance: Incentive Pay Schemes and Employees' Financial Participation.' CEP Discussion Paper No 1112, January.

Cappelli, P., Conyon, M., & Almeda, D. (2019). Social Exchange and the Effects of Employee Stock Options. *Industrial and Labor Relations Review*, forthcoming.

Chelius, J. and Smith, R. 1990. 'Profit sharing and employment stability.' *Industrial and Labor Relations Review* 43: 256-281.

Cohn, A., Fehr, E. and Goette, L. 2015. 'Fair Wages and Effort: Evidence from a Field Experiment.' *Management Science* 61(8): 1777-1794.

Cottini, E., Kato, T. and Westergaard-Nielsen, N. 2011. 'Adverse Workplace Conditions, High-Involvement Work Practices and Labor Turnover: Evidence from Danish Linked Employer-Employee Data.' *Labour Economics* 18(6): 872-880.

Couch, Kenneth A. and Dana W. Placzek. 2010. "Earnings Losses of Displaced Workers Revisited." *American Economic Review*, 100(1): 572-589.

Davis, S. J. and Haltiwanger, J. 1999. 'Gross Job Flows', in Orley Ashenfelter and David Card, eds., Handbook of labor economics. Volume 3B. Amsterdam; New York and Oxford: Elsevier Science, North-Holland, 2711-2805.

Erosa, A., Fuster, L. and Restuccia, D. 2002. 'Fertility Decisions and Gender Differences in Labor Turnover, Employment, and Wages.' *Review of Economic Dynamics* 5: 856-891.

Fehr, E. and Gaechter, S. 2000. 'Fairness and Retaliation: The Economics of Reciprocity.' *Journal of Economic Perspectives* 14: 159-181

Florkowski, G. W. 1987. 'The Organizational Impact of Profit-Sharing.' *Academy of Management Review* 12: 622-631.

Freeman, R. B. 1980. 'The Exit-Voice Tradeoff in the Labor Market: Unionism, Job Tenure, Quits, and Separations.' *Quarterly Journal of Economics* 94(4): 643-673.

Freeman, R. B. and James L. Medoff. (1984). *What Do Unions Do?* New York: Basic Books.

Frederiksen, A. 2008. 'Gender differences in job separation rates and employment stability: New evidence from employer-employee data.' *Labour Economics* 15: 915-937.

Gielen, A. 2011. 'Profit Sharing for Increased Training Investments.' *British Journal of Industrial Relations* 49(4): 643-665.

Green, C. and Heywood, J. 2011. 'Profit Sharing, Separation and Training.' *British Journal of Industrial Relations* 49(4): 623-642.

Godard, J. (2004). A critical assessment of the high-performance paradigm. *British Journal of Industrial Relations*, *42*(2), 349-378.

Gooderham, P., Fenton-O'Creevy, M., Croucher, R., & Brookes, M. (2018). A multilevel analysis of the use of individual pay-for-performance systems. *Journal of Management*, *44*(4), 1479-1504.

Guthrie, J. P. (2000). Alternative pay practices and employee turnover: An organization economics perspective. *Group & Organization Management*, *25*(4), 419-439.

Hall, B. J., & Murphy, K. J. (2002). Stock options for undiversified executives. *Journal of Accounting and Economics*, *33*(1), 3-42.

Hammer, T. H., Landau, J. C., & Stern, R. N. (1981). Absenteeism when workers have a voice: The case of employee ownership. *Journal of Applied Psychology*, *66*(5), 561.

Hamilton, B. H., Nickerson, J. A., & Owan, H. (2003). Team incentives and worker heterogeneity: An empirical analysis of the impact of teams on productivity and participation. *Journal of Political Economy*, *111*(3), 465-497.

Jacobson, Louis, Robert LaLonde, and Daniel Sullivan. 1993. "Earnings Losses of Displaced Workers". *American Economic Review*, 83(4), 685-709.

Jones, D. C., Kalmi, P. and Kauhanen, A. 2010a. 'Teams, Incentive Pay, and Productive Efficiency: Evidence From A Food-Processing Plant.' *Industrial & Labor Relations Review* 63(4): 606-626.

Jones, D.C., Kalmi, P. and Mäkinen, M. 2006. 'The determinants of stock option compensation: Evidence from Finland.' *Industrial Relations* 45(3): 437-468.

Jones, D.C., Kalmi, P. and Mäkinen, M. 2010b. 'The productivity effects of stock option schemes: Evidence from Finnish panel data.' *Journal of Productivity Analysis* 33(1): 67-80.

Jones, D.C., Kalmi, P., Kato, T. and Mäkinen, M. 2012. 'Financial Participation in Finland: Incidence and Determinants.' *International Journal of Human Resource Management* 23(8): 1570-1589.

Jones, D.C., Kalmi, P., Kato, T. and Mäkinen, M. 2017. 'Complementarities between Employee Involvement and Financial Participation: Do Institutional Context, Differing Measures, and Empirical Methods Matter?' *Industrial & Labor Relations Review* 70(2): 395-418.

Kalmi, P., & Kauhanen, A. (2008). Workplace innovations and employee outcomes: evidence from Finland. *Industrial Relations: A Journal of Economy and Society*, 47(3), 430-459.

Kalmi, P. and Sweins, C. 2010. 'The performance impact of financial participation: subjective and objective measures compared', in Tor Eriksson (ed*.),* Advances in the Economic Analysis of Participatory & Labor-Managed Firms, Volume 11, Emerald Group Publishing Limited, pp.69-88

Kato, T. and Morishima, M. 2003. 'The Nature, Scope and Effects of Profit Sharing in Japan: Evidence from New Survey Data.' *International Journal of Human Resource Management* 14(6): 942-955.

Knez, Marc and Simester, Duncan**.** "Firm-Wide Incentives and Mutual Monitoring at Continental Airlines." *Journal of Labor Economics*, 2001, 19(4), pp. 743-72.

Korkeamäki, O. and Kyyrä, T. 2014. 'A Distributional Analysis of Displacement Costs in an Economic Depression and Recovery. *Oxford Bulletin of Economics and Statistics*, 76(4): 565-588.

Kraft, K. and Lang, J. 2013. 'Profit Sharing and Training.' *Oxford Bulletin of Economics and Statistics* 76(6): 940-961.

Kruse, D. L. 1992. 'Profit Sharing and Productivity: Microeconomic Evidence from the United States.' *Economic Journal* 102: 24-36.

Kruse, D. L., Freeman, R. B. and Blasi, J. 2010. Shared Capitalism at Work. NBER and University of Chicago.

Kyyrä, Tomi, and Ralf A. Wilke (2007): 'Reduction in the Long-Term Unemployment of the Elderly: A Success Story from Finland'. *Journal of the European Economic Association*, 5(1): 154–182.

Lazear, E. P. 2000. 'Performance pay and productivity.' *American Economic Review* 90(5): 1346–1361.

Lazear, E.P. 1986. 'Salaries and piece rates.' *Journal of Business* 59(3): 405-431.

Long, R. A. 1980. 'Job Attitudes and Organizational Performance under Employee Ownership.' *Academy of Management Journal* 23: 726-737.

Magnan, M., & St-Onge, S. (2005). The impact of profit sharing on the performance of financial services firms. *Journal of Management Studies*, *42*(4), 761-791.

Nordhaus, W. (1988). Can the share economy conquer stagflation?. *The Quarterly Journal of Economics*, *103*(1), 201-217

O'Halloran, Patrick L, (2012) "Performance pay and employee turnover", *Journal of Economic Studies*, Vol. 39 Issue: 6, pp.653-674.

Pouliakas, K. and Theodossiou, I. 2009. 'Confronting objections to performance pay: The impact of individual and gain-sharing incentives on job satisfaction.' *Scottish Journal of Political Economy* 56(5): 662-684.

Riddell, C. 2011. 'Compensation Policy and Quit Rates: A Multilevel Approach Using Benchmark Data.' *Industrial Relations* 50(4): 656-677.

Sauermann, H. 2017. 'Fire in the Belly? Employee Motives and Innovative Performance in Startups versus Established Firms.' NBER Working Paper No. 23099.

Sousa-Poza, A. and Henneberg, F. 2004. 'Analyzing job mobility with job turnover intensions: an international comparative study.' *Journal of Economic Issues* 38: 113-137.

Theodossiou, I. and Zangelidis, A. 2009. 'Should I stay or should I go? The effect of gender, education and unemployment on labour market transitions.' *Labour Economics* 16: 566-577.

Uusitalo, R. and Vartiainen, J. 2008. Finland: firm factors in wages and wage changes. In E. P. Lazear and K. L. Shaw (eds.), The Structure of Wages: An International Comparison. Chicago and London: University of Chicago Press.

Vroom, V. H. (1964). *Work and motivation*. New York, NY: Wiley & Sons.

Weisberg, J. and Kirschenbaum, A. 1991. 'Employee turnover intentions.' *Journal of Human Resource Management* 2(3): 359-375.

Weiss, A. 1987. 'Incentives and worker behavior'. In H. Nalbantian (ed.), *Incentives, Cooperation, and Risk Sharing*. Totowa, NJ: Rowman and Littlefield, pp. 137–50.

Weitzman, M. L. (1986). The share economy: Conquering stagflation. *ILR Review*, *39*(2), 285-290.

[1] To be able to take into account this difference is an important issue because the presence of PRP (0/1) is a rather coarse measure for the magnitude of monetary incentives PRP provides for an individual worker, in particular when deciding whether or not to continue an ongoing employment match.

[2] Due to some differences in the way the wage records are set up, our data are not fully comparable between white-collar and blue-collar workers. It is also likely that the determinants of the separation process differ between white-collar and blue-collar workers. We therefore analyze white-collar and blue-collar samples separately.

[3] Relatedly, female labor market decisions (e.g. job mobility) may be affected by the presence of young children and women who have just given birth may decide to interrupt their employment spell in order to stay at home with their children --- for example, Erosa et al., (2002) find that fertility decisions produce important gender differences in employee turnover rates. Perhaps more importantly, our data do not allow us to distinguish between "true" female exits from the ongoing job match and female exits from the ongoing job match due to family reasons such as a decision to stay at home to take care of their young children.

[4] In so doing we are aware that a worker's firm ID code can change for reasons other than worker separations. For example, mergers and acquisitions of firms often result in firm ID changes for those workers affected, in spite of the fact that they are still working in the same workplace under the same employment contract. To respond to this potential problem, we verify whether all workers exit from a firm in a given year (i.e. the firm ID changes for all the workers of the firm). If so, we exclude these worker-year observations from the sample (but keep all the preceding years of observations).

[5] As discussed later, note that we control for regional economic conditions by regional unemployment rates and heterogeneity across firms by firm fixed effects. We also exclude worker separations due to plant closures from the sample. Further, we try to address this in our unreported regressions (see pp. 20 and 22) where we consider individual firm performance (proxied by growth of total earnings paid by the firm) as an additional covariate and our results were largely unaffected.

[6] We do not include individual earnings in the basic separation model, since it is potentially an endogenous explanatory variable with individual earnings probably correlated with individual innate ability (in the error term) as well as worker separation (dependent variable). However, in unreported regressions, we do estimate specifications in which we also include individual earnings as an explanatory variable. The reported key findings are largely intact.

[7] In the EK data information on worker education come from Statistics Finland. The level of education consists of six categories (unknown, primary, upper secondary, lowest tertiary, bachelor, and master or higher). We combine the two lowest-level education categories (i.e. unknown and primary) in our analysis.

[8] Somewhat surprisingly, in our sample 26% of blue-collar workers may have received both group and individual incentive pay in a given year. For empirical analysis, this combined performance pay variable is a potential concern since it may be highly correlated with both individual and group incentive pay, making the estimates less precise. Also, the association of this combined variable with worker separation is an aggregate of individual and group incentive effects, which would make its interpretation difficult. We therefore do not include this combined performance pay variable in our models. We did, however, some additional robustness checks to respond to this issue (see p. 22).