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TIIVISTELMÄ

Tutkimuksessa tarkastellaan työmarkkinoiden vaihtuvuuden vaikutuksia työntekijöiden hyvinvointiin. Aineistona käytetään yhdistettyä aineistoa, jossa on tietoja sekä työntekijöiden subjektiivisesta hyvinvoinnista että työmarkkinoiden vaihtuvuudesta rekisteriaineistosta. Tutkimuksessa arvioidaan ns. kompensoivia palkkaeroja selittämällä palkkoja ja työtyytyväisyyttä käyttäen indikaattoria sellaisille toimipaikoille, joissa on ollut korkea ylimääräinen työntekijöiden vaihtuvuus edellisten vuosien aikana. Tulokset tukevat kompensoivien palkkaerojen olemassaoloa, koska epävarmuus kasvattaa palkkoja, mutta sillä ei ole vaikutusta työtyytyväisyyteen.

ABSTRACT

We examine the effects of establishment- and industry-level labor market turnover on employees' well-being. The linked employer-employee panel data contain both survey information on employees' subjective well-being and comprehensive register-based information on job and worker flows. Labor market turbulence decreases well-being as experienced job satisfaction and satisfaction with job security are negatively related to the previous year's flows. We test for the existence of compensating wage differentials by explaining wages and job satisfaction with average uncertainties, measured by an indicator for a high moving average of past excessive turnover (churning) rate. The results are consistent with compensating wage differentials, since high uncertainty increases real wages, but has no effect on job satisfaction.

JEL classification: J28, J31, J63

Keywords: job flows, worker flows, job satisfaction, perceived security, job instability

1. INTRODUCTION

Firm dynamics – creative destruction – accounts for 20-30% of the observed productivity growth in economies around the world (e.g. Foster *et al.* 2001; Bartelsman *et al.* 2004). The creative destruction process entails simultaneous job creation and destruction and worker flows. This implies that there is a positive correlation between turnover in the labor market and productivity growth.

Empirical research has also shown that policy measures can speed up productivity growth through deregulation that facilitates firm dynamics. There is evidence of positive effects on productivity growth from the deregulation of product markets (e.g. Nicoletti and Scarpetta 2003), the removal of employment protection legislation (EPL) (e.g. Autor *et al.* 2007; Bassanini *et al.* 2009), and capital market reforms (e.g. Aghion *et al.* 2007).

Does this productivity-enhancing creative destruction process, however, come at the expense of lower employee well-being in the form of reduced job satisfaction? Indeed, one can easily envisage that a job in an establishment characterized by rapid hiring and firing may be considered to be worse than a job in an establishment characterized by slower worker turnover, because rapid turnover means more uncertainty regarding the future. Also, it is fair to assume that the whole idea of EPL is to decrease uncertainty about future job prospects, because such uncertainty is generally perceived as an unpleasant thing. In this paper, we ask whether changes in wages are enough to counterbalance these negative direct effects of turnover on employees.

A faster pace of creative destruction is also associated with fiercer product market competition. In such an environment, the scope for employee shirking and superfluous on-the-job activities is likely to be smaller than in an establishment characterized by a low level of product market competition. Thus, a negative correlation between employee well-being and the pace of creative destruction may indirectly exist owing to the negative effects on job satisfaction from a high pace of work. Indeed, there is evidence that job satisfaction has declined slightly over time in Britain and Germany (Green and Tsitsianis 2005) and, at least in Britain, the authors ascribe part of this decline to "the intensification of work effort" (Green and Tsitsianis 2005, p. 423).

The potential effects of labor market turnover on employee well-being are particularly important, because job dissatisfaction has been found to be associated with 'negative' activities (see e.g. Warr 1999). These include lower job performance, an increase in absenteeism, more actual and intended job switching, as well as various discretionary activities, like less voluntary overtime, less prosocial activity and less adaptive behavior. All these are likely to increase the firms' costs. From the society's point of view, job dissatisfaction is costly also if it leads to early retirement or withdrawal from the labor market. These effects can erode the positive effects of reforms on performance through the increase in labor market turnover.

In this paper, we examine empirically whether a faster pace of creative destruction negatively affects job satisfaction. The results of this study also have a bearing on the debate regarding the existence of compensating wage differentials. Therefore, we establish whether or not employees receive compensating differentials. If the wage fully compensates for the negative effects of uncertainty in establishments or industries that have a high turnover of employees, then the uncertainties should have no effect on job satisfaction in a regression of job satisfaction on the measures of job uncertainty. This is because the wage fully compensates for the unfavorable job characteristics (Böckerman and Ilmakunnas 2006; Stutzer and Frey 2008).

The unique data set comes from a merge of two data sets. The first one is the Finnish part of the European Community Household Panel (ECHP) for the years 1996-2001. It contains information on individual job satisfaction and various domains of it. The panel dimension of the data allows us to eliminate the bias stemming from unobservable time-invariant individual characteristics, such as positive personality. The results would be biased, if personality were related to willingness to take an insecure job.

The other data set that we use is the Finnish Linked Employer-Employee Data (FLEED). This data set contains comprehensive administrative records of all labor force members as well as all employers/enterprises, including information also on their establishments with near-perfect traceability of employers and employees across time. We connect the data on establishments to the data on individuals and merge this data set with ECHP. Clark et al. (2009) have used a similarly constructed Danish data set.

With the FLEED data we construct measures of gross job and worker flows at the establishment level and merge it with the individual data from FLEED and ECHP. We then estimate models for job satisfaction using these measures of labor market turnover as the main explaining variables. This allows us to produce information about the objective determinants of employees' subjective well-being. In contrast, as Hamermesh (2004) observes, much of the literature on well-being has correlated subjective measures of well-being with subjective responses.

As far as we know, no previous study has examined the connection between creative destruction and employees' well-being by using a nationally representative panel data set. However, there exists research that tackles similar issues. Clark and Postel-Vinay (2009) directly investigate the effect of EPL and unemployment insurance benefits on satisfaction with job security for a number of European countries by using ECHP. They report that satisfaction with job security is negatively related to EPL but positively affected by generous unemployment insurance benefits.1

[1] Theodossiou and Vasileiou (2007) explore the relationship between job satisfaction and job security measured in terms of unemployment expectations. Furthermore, Origo and Pagani (2009) examine the effects of perceived

The article is structured as follows. The next section introduces the data. Section 3 provides a theoretical framework, based on compensating wage differentials. Section 4 describes the hypotheses and empirical specifications. Section 5 presents the baseline estimates and several robustness checks. Section 6 offers concluding comments.

2. DATA AND VARIABLES

The paper takes advantage of the European Community Household Panel (ECHP) for Finland, which is available for the period 1996-2001. The fact that the ECHP is a representative panel of the population is an important advantage. The estimates for narrow sectors could be subject to selection bias, at least to some degree, if the unobserved factors that determine whether employees choose to work in the sector also influence their subjective well-being.

We use two measures of employees' subjective well-being as the dependent variables. One's job satisfaction status is an answer to the question on satisfaction with one's work or main activity. Job satisfaction is measured on an ordinal 6-point Likert scale from 'not satisfied' to 'fully satisfied'. A higher value on this scale means that a person currently feels more satisfied. Primarily, we are interested in the effects on job satisfaction, but we also present descriptive evidence by using satisfaction with job security as the dependent variable. It is an answer to the question: "How satisfied are you with your present job in terms of job security?". Satisfaction with job security is also measured on an ordinal 6-point Likert scale from 'not satisfied' to 'fully satisfied'. As is typical with the subjective measures of well-being at work, there is a concentration of observations toward the higher end of the scale for both of these measures. Thus, the mean values are ~4.5 for both of the measures of satisfaction.

The fact that the ECHP for Finland can be matched to longitudinal register data, FLEED (Finnish Longitudinal Employer-Employee Data), is essential for our purposes.[2] FLEED is constructed from a number of different registers on individuals, firms and establishments that are maintained by Statistics Finland. FLEED contains information from Employment Statistics, which records each employee's employer during the last week of each year. Matching of the data sources is possible, because both the EHCP and FLEED contain the same unique personal identifiers (i.e. ID codes for persons).

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job stability as well as actual job stability (temporary vs. permanent contract) on job satisfaction. Maurin and Postel-Vinay (2005) study the determinants of actual and perceived job insecurity in Europe using the ECHP, and De Bustillo and De Pedraza (2010) perceived insecurity using another survey. There are also related studies (e.g. Vahtera *et al.* 1997; Martikainen *et al.* 2008; László *et al.* 2010; Rugulies *et al.* 2010) that examine the effects of downsizing, job insecurity and workplace closures on health and mortality.

FLEED contains both unique firm and establishment identifiers. Thus, by using FLEED it is possible to calculate the establishment-level measures of job and worker flows. We take advantage of the standard measures of gross job and worker flows (Davis and Haltiwanger 1999). They are based on information on the employees in the establishments at the end of each year. The job flow measures that we use are job creation and destruction rates. The job creation rate (job destruction rate) rate is defined as positive (absolute value of negative) employment change divided by the average of the current and the previous year's employment. The worker flow measures are worker inflow (hiring) and worker outflow (separation) rates. The inflow rate (outflow rate) is the number of hired (separated) employees divided by the average employment.[3] The churning rate, defined as the difference of the worker turnover rate (the sum of worker inflow and outflow rates) and the job turnover rate (the sum of job creation and destruction rates) ties job and worker flows together.[4] Churning is a particularly useful indicator of labor market turnover, because it captures excess worker turnover, i.e. turnover that is not needed for achieving a given job employment change. For this reason, it is a natural indicator of the intensity of restructuring at the establishment level.

In addition to the establishment-level measures of job and worker flows, we use the flow measures that are calculated for 41 2-digit industries. This allows us to identify different levels of labor market turbulence that could potentially have different effects on employees' well-being. At the industry level we also use, besides the measures mentioned above, the excess job reallocation rate, defined as the difference of the sum of job creation and destruction rates and the absolute value of net employment change. (At the establishment level, this measure is always zero.) Excess job reallocation measures the magnitude of gross job flows that is above what is necessary to accommodate the net employment changes. Therefore, it is a measure of simultaneous job creation and destruction. For this reason, it constitutes a very useful indicator of restructuring at the industry level. To explore the existence of compensating wage differentials, we use the rates of churning and excess job reallocation as the explanatory variables to capture the labor market uncertainty that employees face.

The annual flow rates are calculated for the non-farm business sector by using information on an employee's employer during the last week of each year. The public sector (~20% of the observations) is excluded, because the employer codes are not as well-defined as in the business sector and therefore the job and worker flows would not be comparable. The job and worker flow rates in the

[2] To our knowledge, only the Danish ECHP has been previously linked to the longitudinal register data. Clark *et al.* (2009) examine the effect of co-workers' wages on job satisfaction. Their sample size is somewhat larger than ours mainly because two more waves (1994 and 1995) are available for the Danish ECHP.

[3] Worker turnover that is reversed within the year (e.g. hiring a person in January and laying him off in November) is not observed. We cannot distinguish layoffs and voluntary quits, but their difference is not clear from the theoretical perspective, because employers can decrease workers' wages in order to produce (voluntary) quits in the non-competitive labor market.

[4] Since an establishment cannot create and destroy jobs at the same time, the establishment-level job turnover rate is simply the absolute value of the rate of employment change.

Finnish private sector have approximately the same order of magnitude as in other industrialized countries including the U.S. (see Davis and Haltiwanger 1999; Ilmakunnas and Maliranta 2003).

We estimate the models for the wage and salary earners aged 17-64. This produces an effective sample of ~7000 person-year observations for the period 1996-2001, depending on the specification. The exact definitions including the means and standard deviations of the variables are documented in the Appendix (Table A1).

Table 1 reports descriptive evidence of the association between establishment- and industry-level job and worker flows and employees' well-being, based on linear fixed effects estimation.[5] The estimates for establishment-level flows point out that the previous year's job destruction and worker outflow measures are negatively related to job satisfaction, but they are not connected to satisfaction with job security (Table 1, Panels A-B, Columns 1-2).[6] Furthermore, it is interesting to observe that the previous year's industry-level job destruction and worker outflow measures are negatively related to satisfaction with job security (Table 1, Panel B, Columns 3-4).

==== Table 1 here ====

3. THEORETICAL FRAMEWORK OF COMPENSATING WAGE DIFFERENTIALS

Assume that the utility of an employee depends on wage and working conditions: $U = U(w,D,Z)$, where w is wage, D a measure of disamenity related to work, and Z all other variables that affect utility. In our case the disamenities are uncertainties caused by turbulence at the establishment or industry level. It is assumed that $\partial U/\partial w = U_w > 0$ and $\partial U/\partial D = U_D < 0$. On the other hand, if uncertainty is compensated in the form of higher wages, we have $w = w(D,X)$ with $\partial w/\partial D = w_D > 0$. The vector X includes the other determinants of wages, such as the length of education. Inserting the wage equation in the utility function gives $U = U(w(D,X),D,Z)$. Compensation of the disamenity

[5] We could measure turbulence also with other measures like the rates of net employment change, job turnover and worker turnover. To compress the presentation of the results, we do not report the estimates here. In any case, they would not be as informative as those shown in the table. For example, using the net employment change we would impose the restriction that the job creation and destruction rates have a symmetric effect on satisfaction.

[6] Using OLS, however, establishment-level job destruction and worker outflow are negatively related to satisfaction with job security. The (unreported) standard individual-level control variables largely replicate the well-known patterns from other countries. These results are reported and discussed in the working paper version of this paper. Table 1 also provides indirect information about the quality of the establishment link. An industry code is available for practically all individuals in the ECHP. Thus, from the number of observations in the industry-level vs. establishment-level specifications, it is possible to conclude that we are able to obtain the establishment-level labor market flows for ~95% of all individuals in the ECHP.

implies that, in the margin, D does not affect utility, i.e. $dU = U_w w_D dD + U_D dD = 0$. This gives $w_D = -U_D / U_w$. That is, the marginal compensation of uncertainties in terms of wage has to equal the marginal rate of substitution of wage and the source of uncertainty. In a competitive labor market, the trade-off in terms of firms' profits between wage and working conditions would also be equal to the slope of the wage equation.

Most of the literature on compensating wage differentials has tested their existence on the basis of a hedonic wage equation: $w = \theta + \phi D + X\rho$, where wage (or log of wage) is regressed on the usual control variables X and the disamenity variable(s) D (see Fernández and Nordman, 2009, for a recent example of this line of research). If the disamenity obtains a significant positive coefficient, the existence of compensating wage differentials is supported. We also present results with this approach, using as disamenities the establishment- and industry-level labor market flows.

However, in this paper, the main focus is on an alternative way of testing for the existence of compensating differentials, which is based on the utility function (see e.g. Godechot and Gurgand 2000; Helliwell and Huang 2010; Stutzer and Frey 2008). If utility depends on wage and disamenities, and wage fully reflects compensation for the working conditions (i.e. $w_D = -U_D / U_w$), then inserting the wage as a function of disamenities in the utility function should wipe out the disamenities. This is easily demonstrated in the linear case: $U = \alpha + \delta w + \beta D + Z\gamma$ and $w = \theta + \phi D + X\rho$, where U is measured by job satisfaction and X and Z denote all other variables. Inserting the wage function in the utility function gives the reduced form utility $U = \alpha + \delta\theta + (\beta+\delta\phi)D + Z\gamma + X\rho\delta$. The existence of compensating wage differentials implies that $\phi = -\beta/\delta$. If this constraint holds, the disamenities D are wiped out, so neither wage nor disamenity appears in the utility function. Compensating wage differential can therefore be tested by examining whether the hypothesis $\beta^* = 0$ holds in the job satisfaction equation: $U = \alpha^* + \beta^* D + X\gamma^* + Z\rho^*$, where wage is not included. A significant negative coefficient for the disamenity would be evidence against compensating wage differentials. Note that the variables Z that affect utility and the variables X that affect wage can be partly the same. In this case the estimated coefficients of these variables would be combinations of utility function and wage function parameters. However, if we are interested in testing for compensating wage differentials, these effects need not be identified separately.

Measurement of utility at work is not a trivial task. A natural candidate for it is employees' job satisfaction. It is a typical feature of employee surveys that job satisfaction is expressed in an ordinal scale with a few alternatives. As has already been seen, this is also the case with the data that we are using.

4. HYPOTHESES AND EMPIRICAL SPECIFICATIONS

The basic hypothesis is that under compensating wage differentials, job and worker flows increase wages, but they do not affect job satisfaction. However, if labor market uncertainties are not fully compensated with higher wages, unfavorable aspects like churning at the establishment or industry level should be negatively related to job satisfaction.

We estimate specifications of the following type:

$$Y_{ijkt} = \beta \boldsymbol{X}_{ijkt} + \alpha_i + UNCERTAINTY + \delta_k + \lambda_t + \varepsilon_{ijkt} \quad (1)$$

where Y_{ijkt} is the outcome (real wage or job satisfaction) for individual *i* employed in establishment *j* in region *k* in year *t*. $\boldsymbol{X}_{ijkt}$ represents control variables, which incorporate the standard individual-level covariates such as employees' age and education level that can be regarded as 'the usual suspects', based on the literature on job satisfaction (e.g. Clark 1996).[7] Because we estimate fixed effects specifications, the indicator for gender is omitted from the vector of control variables.

α_i represents the individual-specific fixed effects. Lykken and Tellegen (1996) demonstrate by using twin data that 44-80% of the variation in individuals' self-assessed well-being emerges from genes and upbringing. Therefore, the individual-specific fixed effects are extremely important determinants of subjective well-being. Also, fixed effects specifications are able to mitigate the problems created by the potential endogeneity of the explanatory variables, to the extent that they are determined by time-invariant unobserved employee attributes. In our case, the choice of an uncertain establishment or industry might be related to the unobservable characteristics.

The variable of the interest is *UNCERTAINTY*, which is a measure of labor market turbulence. It is not immediately obvious how one should measure the uncertainties for testing the compensating differentials. We have seen above that 'negative' shocks such as the separation of workers from the establishment or the decrease in the number of jobs is negatively related to well-being. However, are these labor market flows the kinds of risks that should be compensated? The theory of compensating wage differentials point outs that *average* risk is compensated by means of higher wages. However, it does not imply that risky outcomes (*ex post*) are compensated. Otherwise, there would be a labor-market situation in which a specific negative demand shock in an establishment would raise wages

[7] The individual-level covariates originate from the ECHP with the exception that the establishment size groups are taken from FLEED, because employers' characteristics reported by employees themselves can sometimes be unreliable.

there. Even average job destruction or average worker outflow as the measures of uncertainty would be problematic: firms with poor prospects are not likely to pay higher wages.[8]

Instead, we use the measures that are related to excessive volatility in the establishment or in the industry, i.e. the rates of churning or excess job reallocation. To capture the average risk that employees face, we use 3-year moving averages of the establishment- and industry-level flows over the period t-1 – t-3.[9] The first period t-1 is chosen to ensure that the flow happens before satisfaction is observed. As an alternative, we use flows lagged by one year. It is also likely that the impact of volatility is nonlinear so that small volatility is not reflected in well-being or not compensated by means of higher wages. Therefore, we have categorized the establishments and industries for which employees work as high-churning (or high excess reallocation) ones if the moving average of the churning (or excess job reallocation) rate exceeds 20%, following Golan *et al.* (2007). This cut-off point makes sense in our matched data, because the mean value for establishment-level churning is ~24% (see the Appendix, Table A1). Note that the establishment- and industry-level flow measures are exogenous to individual employees.

δ_k represents a full set of indicators for NUTS2 regions. They pick up all average differences in employees' satisfaction across regions. λ_t represents the fixed effects associated with the year (survey waves). The time effects capture any changes that affect all employees' well-being in the same way. These indicators allow for the existence of macroeconomic effects, because they have been shown to be important determinants of subjective well-being (e.g. Clark *et al.* 2010).

It is useful to note that we do not incorporate indicators for industries in the baseline specifications, because most employees do not change their industry over the period 1996-2001, which makes it difficult to identify a full set of industry effects in the fixed effects estimation. Standard errors are clustered at the individual level, because we have repeated observations on individuals.[10]

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[8] Cahuc *et al.* (2002) develop a dynamic model of firm-level bargaining that predicts that the higher the rate of job destruction within firm, the higher the compensation of employees. They obtain evidence supporting this by using a panel of French firms. An alternative argument is that job destruction increases unemployment fears, reduces bargaining power and therefore decreases wages. Campbell *et al.* (2007), and Hübler and Hübler (2010) analyze the effect of job security on wages based on this view.

[9] This is somewhat similar to Magnani (2002), who has presented U.S. evidence about the positive effects of industry-specific volatility on earnings, using the moving average of industry-specific shipment volatility as a proxy for unemployment risk. This is exogenous to individual employees as opposed to individual unemployment histories, which reflect largely unobserved heterogeneity among employees.

[10] We cannot calculate establishment-clustered standard errors, since employees who change their establishment over time belong to several different clusters.

5. RESULTS

5.1. Baseline estimates

To explore the existence of compensating wage differentials, we start by estimating hedonic wage equations in which uncertainties are treated as job disamenities to establish whether employees are compensated by means of higher wages for facing labor market turbulence at the establishment or industry level. In the baseline estimates, we use an indicator for the high churning rate as the measure of disamenity. We use specifications that take into account the individual-specific fixed effects in linear panel data models.

We find evidence that high churning at the establishment level has a statistically significant positive effect on real wages (Table 2). This shows that restructuring at the establishment level is beneficial for employees when it is more intensive than a threshold. The point estimate from the specification that uses the 3-year moving average of the indicator for high-churning establishments reveals that real wages are ~1.7% higher in establishments with high churning (Table 2, Panel A, Column 2). Regarding the quantitative magnitude of the estimate it is useful to note that Finland has a relatively centralized wage bargaining system, which sets restrictions on establishment-level pay determination. The system also leads to substantial wage compression.

==== Table 2 here ====

To examine the effect of uncertainties on job satisfaction, we estimate specifications that take into account the ordinal nature of the satisfaction measure while using the panel dimension of the linked data at the same time. To include fixed effects in the ordered logit estimation, we follow the suggestion of Ferrer-i-Carbonell and Frijters (2004). They show that an ordered logit model with fixed effects can be estimated as a fixed effect logit (conditional logit) model, where the ordered data are collapsed to binary data with individual-specific thresholds. In our case, the recording of observations to "high" and "low" satisfaction is individual-specific, based on the individuals' average satisfaction scores in the panel over the period 1996-2001. Only individuals with changes in their satisfaction status over time can be included in the estimations.

The results show that high churning at the establishment level has no statistically significant effect on job satisfaction (Table 2, Panel B, Columns 1-2). Thus, the significant effects of high churning on real wages and insignificant effects on job satisfaction at the establishment level give consistent support for the existence of compensating wage differentials for uncertainties. We also find that the indicator for high-churning industries has no effect on real wages nor on job satisfaction (Table 2, Panels A-B, Columns 3-4). Therefore, there is establishment- rather than industry-level compensation for

uncertainty. (Although, of course, the insignificant effect on job satisfaction at the industry level is consistent with the hypothesis of compensating differentials.)

5.2. Robustness checks

To check the robustness of the baseline estimates, we have estimated several alternative specifications. We briefly discuss the results without presenting them in tables. First, we have used an indicator for a high excess job reallocation rate as a measure of uncertainty. Since job reallocation can only be measured at the industry level, this measure is an alternative for the industry-level churning rate. Our finding was similar to that in Table 2: the indicator for high excessive reallocation was not significant in either the wage or the job satisfaction equation. It seems that it is the establishment rather than industry-level volatility that is the source of more uncertainty among the employees.

Second, we have used continuous measures of the flows, in essence assuming that there is a linear relationship between the flows and wage or job satisfaction. The results on the wage equation changed, as the flows were not significant. Therefore, using the continuous measures we obtain conflicting evidence on the compensating wage differentials. It seems that taking the nonlinearities in the relationships into account is important.

Third, we have also experimented with different sets of control variables and estimation samples. We have estimated specifications that include a full set of indicators for 41 2-digit industries. In addition, we have excluded the individual-level control variables ($\boldsymbol{X}_{ijkt}$) from the models to examine the zero-order correlations between the measures of labor market turnover and employees' well-being, because the standard control variables of the models (i.e. age and education level) are strongly correlated with individual wages. Moreover, we have estimated models that include employee-specific linear time trends in addition to the individual-specific fixed effects, following e.g. Jacobson et al. (2005). These models control for any unobserved employee characteristics that change at a constant rate over time, which can be related to, for instance, career development. Also, we have estimated specifications in which we have dropped the smallest establishments (those with less than 20 employees) from the data. The turnover rates are much higher among them, so the results may be driven by these observations. The baseline results of Table 2 remain unchanged in these specifications.

Fourth, we have estimated models that include an indicator for those who have changed their establishment during the past year to account for outside options.11 There may be a tendency for dissatisfied employees to switch from the establishments with high turnover to those with low turnover. This could lead to a situation in which employees with the highest distaste for turnover

[11] We do not drop job changers from the data, because this would produce a biased sample.

gradually move into establishments with the lowest level of actual turnover. Therefore, the estimates in Table 2 could underestimate the negative effects of labor market turnover on satisfaction. However, the inclusion of an indicator for job changers has only a small effect on the results. One explanation for this is that high average unemployment over the data period (~11%) has hindered employees' efforts to improve their labor market position by taking advantage of outside options. Interestingly, the indicator for job changers obtains a statistically significant positive coefficient in most of the models. This pattern is in accordance with the results by Akerlof et al. (1988). They show that job changes generally lead to an increase in job satisfaction.

Finally, we have explored the possible sources of heterogeneity in the relationship between labor market turbulence and employees' well-being. The results remain similar for those with at least 10 years of tenure. We have also estimated the models separately for those younger than 35 (but use the flow measures that capture the turnover among the whole workforce in the establishments). It is interesting to note that the indicator for the high 3-year moving average of establishment-level churning obtains a positive coefficient of 0.0357 in the wage equation that is statistically significant at the 2% level. This effect (~3.6%) is roughly twice the wage effect (~1.7%) for all employees (Table 2, Panel A, Column 2). The insignificant effect of churning on job satisfaction remains intact for employees younger than 35.

6. CONCLUSIONS

Matching administrative records to individual well-being responses provides a natural way to improve the understanding of how the labor market works. This is the first study of the connection between creative destruction and employees' well-being by using a nationally representative panel data set. Our novel interpretation of compensating wage differentials relies on linked employer-employee panel data that contain both survey information on employees' subjective well-being and comprehensive register-based information on job and worker flows in the private sector. The panel allows us to eliminate the bias stemming from unobservable individual characteristics that may be related to selectivity to different kinds of jobs.

We test for the existence of compensating wage differentials by explaining wages and job satisfaction with uncertainties. The baseline results show that high excessive worker turnover, or churning, at the establishment level is positively related to individual wages. We also find that it is not a statistically significant determinant of job satisfaction. Therefore, the baseline estimates provide evidence supporting the existence of compensating wage differentials. However, we find no wage effects when a continuous measure of churning is used. Uncertainty does not seem to have a linear effect.

The broader methodological lesson is that it is important to take a step further and use also the measures of job satisfaction to test the existence of compensating wage differentials. The existing literature on compensating wage differentials has almost exclusively used only hedonic wage equations to evaluate the hypothesis. Our findings may be partly related to the specific institutional characteristics of the labor market in Finland, which include a substantial wage compression. In another kind of institutional setting one might find stronger evidence.

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TABLE 1. THE ASSOCIATION OF ESTABLISHMENT- AND INDUSTRY-LEVEL JOB AND WORKER FLOWS WITH EMPLOYEES' WELL-BEING.

Panel A: Job satisfaction	(1)	(2)	(3)	(4)
	Establishment-level flows		Industry-level flows	
	FE OLS	FE OLS	FE OLS	FE OLS
Job creation rate	0.0230		-0.2824	
	(0.0308)		(0.2892)	
Job destruction rate	-0.0969**		0.5554*	
	(0.0469)		(0.3044)	
Worker inflow rate		0.0182		-0.4236
		(0.0326)		(0.2833)
Worker outflow rate		-0.0989**		0.3976
		(0.0475)		(0.2957)
N	7173	7173	7555	7555
Panel B: Satisfaction with job security	(1)	(2)	(3)	(4)
	Establishment-level flows		Industry-level flows	
	FE OLS	FE OLS	FE OLS	FE OLS
Job creation rate	0.0305		0.5183	
	(0.0373)		(0.3664)	
Job destruction rate	0.0121		-0.9624**	
	(0.0569)		(0.4134)	
Worker inflow rate		0.0002		0.6706*
		(0.0390)		(0.3569)
Worker outflow rate		-0.0513		-0.8071**
		(0.0562)		(0.3974)
N	7165	7165	7546	7546

Notes: The dependent variable is job satisfaction in Panel A. In Panel B the dependent variable is satisfaction with job security. The job and worker flows are lagged by one year. The models in Columns 1-2 are estimated by using establishment-level flows. The models in Columns 3-4 are estimated by using 41 2-digit industry-level job and worker flow measures. All models are estimated by using OLS with the individual-specific fixed effects. All models include a full set of indicators for years (survey waves) and regions. All models also contain all the (unreported) individual-level control variables that are listed in the Appendix (Table A1). Robust standard errors in parentheses, clustered at the individual level. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

TABLE 2. THE EFFECT OF ESTABLISHMENT- AND INDUSTRY-LEVEL UNCERTAINTY ON WAGES AND EMPLOYEES' JOB SATISFACTION.

Panel A: The effect on wages	(1)	(2)	(3)	(4)
	FE OLS	FE OLS	FE OLS	FE OLS
High churning rate (establishment-level, flow lagged by one year)	0.0136**			
	(0.0068)			
High churning rate (establishment-level, 3-year moving average)		0.0165**		
		(0.0071)		
High churning rate (industry-level, flow lagged by one year)			-0.0051	
			(0.0068)	
High churning rate (industry-level, 3-year moving average)				-0.0063
				(0.0078)
N	7185	7173	7185	7185
Panel B: The effect on job satisfaction	(1)	(2)	(3)	(4)
	FE ordered logit	FE ordered logit	FE ordered logit	FE ordered logit
High churning rate (establishment-level, flow lagged by one year)	-0.0432			
	(0.0725)			
High churning rate (establishment-level, 3-year moving average)		0.0370		
		(0.0906)		
High churning rate (industry-level, flow lagged by one year)			-0.0747	
			(0.1043)	
High churning rate (industry-level, 3-year moving average)				0.0670
				(0.1078)
N	5163	5160	5163	5163

Notes: The dependent variable is real wage in Panel A. In Panel B the dependent variable is job satisfaction. The establishments and industries for which employees work are categorized as high-churning ones if the (moving average of the) churning rate exceeds 20%, following Golan *et al.* (2007). The models in Panel A are estimated by using OLS with the individual-specific fixed effects. The models in Panel B are estimated by using ordered logit with the individual-specific fixed effects, as explained in the text. All models include a full set of indicators for years (survey waves) and regions. All models also contain all the (unreported) individual-level control variables that are listed in the Appendix (Table A1). Note that real wage is not included in the set of control variables in the models of Panel B. Robust standard errors in parentheses, clustered at the individual level. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

APPENDIX

TABLE A1. DEFINITIONS AND DESCRIPTIVE STATISTICS OF THE VARIABLES.

Variable	Mean (standard deviation)	Definition/measurement
Dependent variables		
Job satisfaction	4.512 (0.972)	Job satisfaction is measured on an ordinal 6-point Likert scale from 'not satisfied' to 'fully satisfied' (the question PK001). A higher value means that a person currently feels more satisfied. (Source: ECHP)
Satisfaction with job security	4.502 (1.233)	Satisfaction with job security is an answer to the question (PE032): "How satisfied are you with your present job in terms of job security?". Satisfaction with job security is measured on an ordinal 6-point Likert scale from 'not satisfied' to 'fully satisfied'. A higher value means that a person currently feels more satisfied. (Source: ECHP)
Real wage	8.874 (0.439)	A logarithm of real monthly wage, deflated to the year 2000 by using the consumer price index. (Source: ECHP)
Independent variables		
Job and worker flows		
Job creation rate	0.193 (0.419)	Industry-level job creation is calculated by adding up positive employment changes at the establishment level. The rate is calculated by using as denominator the average number of employees in two consecutive years. At the establishment level job creation is positive employment change or zero. (Source: FLEED)
Job destruction rate	0.070 (0.240)	Industry-level job destruction is the sum of the absolute values of negative employment changes at the establishment level. The rate is calculated by using as denominator the average number of employees in two consecutive years. At the establishment level job destruction is the absolute value of negative employment change or zero. (Source: FLEED)
Excess job reallocation rate	0.197 (0.084)	The excess job reallocation rate equals the job reallocation rate (job creation rate + job destruction rate) minus the absolute value of the net employment change (job creation rate – job destruction rate). It measures the magnitude of gross job flows that is above what is necessary to accommodate the net employment changes. At the establishment level excess job reallocation is zero.
Worker inflow rate	0.312 (0.417)	Worker inflow is calculated by counting the number of employees who are in an establishment at the end of a year and were not there at the end of the previous year. The industry inflow is the sum of establishment inflows. The rate is calculated by using the average number of employees in the establishment during two consecutive years as the denominator. (Source: FLEED)
Worker outflow rate	0.188 (0.261)	Worker outflow is calculated by counting the number of employees who were in an establishment at the end of the previous year, but are not there at the end of the current year. The industry outflow is the sum of establishment outflows. The rate is calculated by using the average number of employees in the establishment during two consecutive years as the denominator. (Source: FLEED)

Churning rate	0.237 (0.238)	Worker flow rate (the sum of worker inflow rate and worker outflow rate) – job reallocation rate (the sum of job creation rate and job destruction rate). It measures the magnitude of worker turnover that is above what is needed to accommodate the job turnover.
Human capital variables		
Age <=24	0.108 (0.310)	Age <= 24 = 1, otherwise = 0 (Source: ECHP)
Age 25-34	0.263 (0.440)	Age 25-34 = 1, otherwise = 0
Age 35-44	0.291 (0.454)	Age 35-44 = 1, otherwise = 0 (reference)
Age 45-54	0.270 (0.444)	Age 45-54 = 1, otherwise = 0
Age 55-64	0.068 (0.252)	Age 55-64 = 1, otherwise = 0
Married	0.599 (0.490)	Married = 1, otherwise = 0 (Source: ECHP)
Basic education only	0.216 (0.412)	Less than second stage of secondary level education (International Standard Classification of Education 0-2) = 1, otherwise = 0 (reference) (Source: ECHP)
Middle education	0.475 (0.499)	Second stage of secondary level education (ISCED 3) = 1, otherwise = 0
Higher education	0.309 (0.462)	Third level education (ISCED 5-7) = 1, otherwise = 0
Self-assessed health	3.985 (2.995)	Self-assessment of health is scaled from 1 to 5 (top condition). (We have reversed the original scale of the health measure to emphasize that higher numbers correspond to better health.) (Source: ECHP)
Employer characteristics		
Establishment size <=4	0.115 (0.319)	Size of establishment at most 4 employees = 1, otherwise = 0 (reference) (Source: FLEED)
Establishment size 5-9	0.110 (0.313)	Size of establishment 5-9 employees = 1, otherwise = 0
Establishment size 10-19	0.126 (0.332)	Size of establishment 10-19 employees = 1, otherwise = 0
Establishment size 20-49	0.163 (0.370)	Size of establishment 20-49 employees = 1, otherwise = 0
Establishment size 50-99	0.107 (0.309)	Size of establishment 50-99 employees = 1, otherwise = 0
Establishment size > 100	0.379 (0.485)	Size of establishment over 100 employees = 1, otherwise = 0
Indicators		
Years (survey waves)	..	Indicators for 6 years, 1996-2001
Regions	..	Indicators for 6 NUTS2 regions

Notes: Descriptive statistics refer to the establishment-level job and worker flows except in the case of the excess job reallocation rate in which they refer to the 2-digit industry-level measures.