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DISCUSSION PAPER SERIES

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ABSTRACT

Does Job Support Make Workers Happy?[1]

Using linked employer-employee data for Finland we examine associations between job design and ten measures of worker wellbeing. In accordance with Karasek's (1979) model we find positive correlations between many aspects of worker wellbeing and job control. However, contrary to the model, job demands have no adverse effects on worker wellbeing. We find a strong positive correlation between job support and all aspects of worker wellbeing that is independent of job controls and job demands, a finding that has not been emphasized in the literature. The effects are most pronounced in relation to supervisor support. We also find evidence of unemployment scarring effects: substantial experience of unemployment has long-term consequences for the wellbeing workers experience in their current jobs, even controlling for the quality of those jobs.

JEL Classification: J28, J8, L23, M54

Keywords: worker wellbeing, job control, job demands, job support, job design, supervisors, job satisfaction, stress, HRM, unemployment, scarring effects

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1. INTRODUCTION

In the standard labour supply model there is a marginal disutility to additional work because performing it eats into leisure time. Consequently, people are paid to work and will respond to financial incentives with greater effort at the extensive and intensive margins. Recent research on momentary wellbeing is consistent with this proposition: working is second only to being sick in bed when individuals are randomly dinged on their smart-phone and asked how happy they are during an activity (Bryson and MacKerron, 2016). At the same time, paid work contributes to higher reported life satisfaction, even after controlling for income, and individuals report being more fulfilled when their lives include paid employment (Blanchflower and Oswald, 2011). Their life satisfaction is particularly adversely affected by bouts of unemployment. Indeed, unemployment is one of the few episodes in life that people struggle to recover from in happiness terms (Clark et al., 2008).

These findings on the adverse and positive associations between wellbeing and paid employment are not necessarily contradictory. Rather they reflect the influence of paid work on different aspects of wellbeing: when individuals reflect back on their lives paid work contributes to satisfaction with that life but, at the margin, individuals would often rather be doing something else.

When examining the relationship between wellbeing and paid work one should be mindful not only of the different dimensions of wellbeing, but also that not all jobs are the same. This literature began as far back as Adam Smith's discussion of compensating wage differentials in *The Wealth of Nations* (1776) in which he argued that workers were more likely to undertake jobs with poor working conditions where they commanded a higher wage to compensate them for those conditions. More recently a literature in psychology has revisited the issue of non-pecuniary job attributes and their influence on worker wellbeing.

The seminal work in this field has been undertaken by Karasek (1979) and Karasek and Theorell (1990). The original model focuses on two aspects of job design: the demands the job makes on the individual and the degree of control the employee has over aspects of their job (what Karasek termed "job decision latitude"). Under the model job demands create job stress, thus having a negative impact on worker wellbeing, while job control has a positive direct influence on wellbeing, as well as being able to mitigate the adverse effects of job demands. It is the combination of low job control and high job demands that is associated with mental strain and job dissatisfaction. As we shall see in Section Two, many empirical studies confirm these propositions. Subsequent empirical studies have incorporated forms of job support (supervisory, co-worker and non-work) and find these can mitigate the effects of job demands on job stress.

We contribute to this literature in two ways using nationally representative survey data for Finland. First, we seek to identify the association between job design and worker wellbeing having taking account of worker selection into jobs that differ along the dimensions of job control, job demands and job support. We do so by conditioning on workers' labour market histories prior to entering their current job. Therefore, we consider the sensitivity of the link between job attributes and wellbeing to the inclusion of work histories. Second, we examine links between job attributes and ten wellbeing outcomes, thus providing a much more comprehensive assessment of the links between job demands, control and support and wellbeing, as seems merited by the subjective wellbeing literature which emphasizes the important differences between aspects of wellbeing and differences in their correlates.

The Finnish setting has broader interest for several reasons. First, Finland is known for its high take-up of high involvement management practices which are characterized by high levels of job control and job demands (Böckerman et al., 2012). Second, in contrast to

much of the literature which is conducted in Anglo-American countries with low unionization rates, Finland has high unionization. Prior research suggests that the outcomes for workers can be different in countries with high unionization (Godard, 2004). This may be the case with regard to job design, for instance, where union membership rates of around 70 percent in Finland imply a substantial worker say in how jobs are designed. Third, despite a potential role for worker voice in the design and implementation of job design, Finland has the highest sickness absence rate in the European Union (Gimeno et al., 2004), raising questions about the link between job design and worker wellbeing.

In accordance with Karasek's (1979) model we find positive correlations between many aspects of worker wellbeing and job control. However, contrary to the model, job demands have no adverse effects on worker wellbeing. We find a strong positive correlation between job support and all aspects of worker wellbeing that is independent of job controls and job demands, a finding that has not been emphasized in the literature. The effects are most pronounced in relation to supervisor support. We also find evidence of unemployment scarring effects: substantial experience of unemployment has long-term consequences for the wellbeing workers experience in their current jobs, even controlling for the quality of those jobs.

2. LITERATURE

Karasek's (1979) model of worker wellbeing as a function of job design has been labeled "perhaps the most popular theory of the predictors of job wellbeing" (Wood, 2008: 156). It maintains that, when entered separately into a worker wellbeing equation in an additive fashion job demands adversely affect employee wellbeing, whereas job control is positively associated with wellbeing. Furthermore, in a multiplicative model in which job control and job demand are interacted with one another job control will mitigate the adverse effects of

job demands. A large empirical literature has emerged testing these propositions. Reviews of the early empirical literature indicated substantial support for the additive model and some, though less compelling evidence, for the multiplicative model (de Lange et al., 2003; van der Doef and Maes, 1999).

More recently regression analyses of British linked employer-employee data indicated that "the characteristics of the job are considerably more important in influencing wellbeing than employee or workplace characteristics" (van Wanrooy et al., 2013: 130) and provided strong support for Karasek's additive model using three different measures of worker wellbeing, namely job-related contentment, job-related enthusiasm and overall job satisfaction (op. cit.: 129-134). The findings were broadly replicated in a subsequent comparative analysis of job satisfaction for Britain and France using linked employer-employee data (Bryson et al., 2016: 204-205).

Payne (1979) added support to the demand and control model arguing that various types of support at the workplace, particularly social support from supervisors and colleagues, could assist employees in dealing with high demands, thus lowering work strain and stress. Karasek and Theorell (1990: 68-76) subsequently incorporated support into Karasek's original model. Wood (2008: 156) identifies three channels by which social support may buffer the adverse effects of job demands: role clarity, helping people "manage" their feelings better and, following Warr (2011), motivational support intended to reassure workers that their extra efforts will eventually reap rewards.

Early empirical studies found some evidence to suggest that low social support among those facing high job demands and low job control accentuated job strain (Landsberger et al., 1992; Payne and Fletcher, 1983) and cardiac risk (Johnson and Hall, 1988). More recent evidence only finds partial support for the buffering role of social support. Sargant and

Terry's (2000) study of university clerical workers found clear evidence that, when combined with high job control, high levels of supervisory support mitigated the adverse effects of job demands on both job satisfaction and feelings of depersonalization, while co-worker support and non-work support did not. Using nationally representative linked employer-employee data for Britain Wood (2008) finds supportive management does not buffer the effects of job demands in raising job-related anxiety.

Analysts' desire to test the Karasek model has meant they have focused on the main effects of job demands, job controls and the interaction between the two, as well as the buffering role of social support. In doing so they have downplayed the independent effects of social support in isolation, and the other multiplicative effects when combining support, demands and control. This is somewhat surprising given the importance of social interactions to human beings in a range of contexts. Kahneman et al.'s (2004) Day Reconstruction Method study indicated that individuals prefer being with almost anybody compared to being on their own. Bryson and MacKerron (2016) find "Talking, Chatting and Socialising" ranks seventh out of forty activities in terms of its association with momentary happiness, and that it is only when one is doing this that the underlying negative effect of working on momentary happiness is wiped out (op. cit.: 16). It is possible that part of this "social" effect at work is because being with others is a distraction from work activity, or is simply pleasurable in its own right.

However, a number of the studies discussed above also find supportive management has a *direct* effect on worker wellbeing. For instance, Wood (2008) finds that supportive management, consultative management and informative management are all positively and significantly associated with lower job-related anxiety and higher job satisfaction. Similarly, van Wanrooy et al. (2013: 132-134) find that the main effect of their supportive

management scale is positive and statistically significant in models estimating job-related contentment, job-related enthusiasm and overall job satisfaction. Bryson et al. (2016: 204-205) also find this is the case for job satisfaction in their comparative analysis of British and French employees in the private sector.

One complication is that there is an exception to Kahneman et al.'s (2004) general finding that people are happier when they are with others. The exception is when they are with their boss. It seems likely that the effects of supervisory "support" depend on the quality of the relationship between a worker and his or her supervisor. Recent evidence from Denmark finds that having an unsupportive boss leads to a large increase in the probability of voluntary quits (Cottini et al., 2011). This might also explain why Sergant and Terry (2000) find supervisory support has no direct independent association with job satisfaction whereas the main effect of co-worker support on job satisfaction is positive and statistically significant. Using both British and U.S. data Artz et al. (2016) focus on boss competence and show that it is a very important determinant of employee job satisfaction.

There are two potentially important drawbacks to the literature examining links between worker wellbeing and job design. The first is that the partial correlations presented in regression analyses pay little attention to non-random sorting into jobs by workers. This is a potentially important oversight since there is a substantial literature about workers and firms seeking good worker-job matches (Jovanovich, 1979). Where workers are heterogeneous in their tastes for hard work (job demands), and their desire for autonomy (job control), or where heterogeneous risk preferences mean employees place various amounts of weight on the support they will receive from their supervisor to perform a task, workers will sort into different types of job according to the utility they think they will

derive from the job.[2] At the same time, employers may signal their desire for certain types of worker conditional on the jobs they have available, as in the case of Lazear's (2000) model in which firms seek more productive workers through the use of incentive schemes. It seems very likely that worker sorting across firms arising from worker and employer choices, will result in non-random exposure to job demands, job controls and job support, imparting a bias to estimates of the links between job design and worker wellbeing if one cannot account for that sorting. A priori it is unclear which way any bias may go. It depends, in part, on how efficient the labour market is in allocating workers to the jobs they would ideally like to perform. If certain types of jobs are rationed (in the sense that demand for them exceeds their supply), effects of job demands, for example, may prove more negative for worker wellbeing than in a scenario in which all workers sort into the types of jobs that best suit their preferences.

We address sorting by conditioning on workers' labour market and earnings histories in the previous ten years, as detailed in Section Three. There are two reasons to condition on work and earnings histories. The first is that employers seek out high ability workers to work in demanding jobs – that is, those with high demands and high job autonomy. This explains why the wage premium attached to "high involvement" jobs falls conditioning on employees' work histories (Böckerman et al., 2013). If there is a correlation between ability and wellbeing that is not accounted for in our model, this may bias our estimates of the links between job design and worker wellbeing.[3] Conditioning on work histories therefore

[2] This is a finding that crops up in a number of settings. For example, Plug et al. (2014) show that gays and lesbians behave in response to their perceptions regarding the incidence of prejudice by sorting themselves into occupations with more tolerant employers and co-workers – the sort of behaviour one might anticipate where workers are concerned about the amount of job support they might receive from supervisors and colleagues.

[3] Such a correlation is plausible. There is a literature indicating that the job satisfaction of workers is negatively correlated with observable indicators of ability such as education and earnings (Clark and Oswald, 1996). If observable and unobservable indicators of ability are positively correlated this would suggest the incorporation of work histories may mitigate the bias.

helps identify potential misallocation of workers to jobs, giving us greater confidence that the model accurately identifies the link between worker wellbeing and job design for "like" employees. The second reason is that, as the programme evaluation literature makes clear, matching on work histories helps soak up otherwise omitted variables that can bias estimates of the effect of treatments on labour market outcomes (Barnow and Smith, 2015). Thus, notwithstanding concerns about non-random worker-job sorting, it is likely that conditioning on work histories will partial out otherwise unobserved worker heterogeneity which could potentially bias our estimates.

The association between prior unemployment and subsequent worker wellbeing is of particular interest. Previous studies confirm that past unemployment has a scarring effect on individuals' psychological wellbeing, even when conditioning on current employment status (Clark et al., 2001). This could reflect the inhibiting effect of a poor work history in obtaining a higher quality of job in the future. However, no studies condition on current job quality when examining the links between past unemployment and current worker wellbeing.

A second potential limitation to the existing literature is that studies examine the links between job design and a wide array of wellbeing measures, but no one study carefully examines the job design association with a number of wellbeing measures at the same time. Most studies have focused on various measures of job satisfaction, sometimes in conjunction with one or two other measures such as job-related anxiety and job-related enthusiasm. Few examine more than three measures of wellbeing in the same paper. Consequently, it is difficult to know whether the different associations between job design and worker wellbeing reflect cross-study differences in methodology, the population of interest, sampling design and data items, or whether the differences reflect genuinely

different associations between worker wellbeing and particular facets of job design. This would not be a concern if wellbeing measures were really slightly different takes on the same underlying construct but this is not the case. In fact, worker wellbeing is multi-dimensional, with different measures capturing quite different aspects of affect (Bryson et al., 2014). Furthermore, even when measures of worker wellbeing are quite highly correlated, their correlations with job facets can differ quite markedly. For instance, in their analyses of British linked employer-employee data, Bryson et al. (2012) show that worker wages are positively correlated with job satisfaction, but negatively correlated with job-related contentment, even though contentment and satisfaction are highly positively correlated. For this reason, there is value in examining the links between job design and various facets of worker wellbeing in the same paper, using identical measures of job design, control variables and estimation techniques so that we can clearly establish the nature of the job design effect across an array of wellbeing outcomes. As we show in the next section, we run analyses for ten worker wellbeing measures.

3. DATA AND ESTIMATION

The analyses are based on the Finnish part of the European Meadow project *Measuring the Dynamics of Organisations and Work* conducted by Statistics Finland (Meadow Consortium, 2010; Alasoini et al., 2014). The aim was to gather comprehensive information on the changes in work organisation and perceived working conditions. The survey covers both Finnish private and public sector organisations excluding employers that had fewer than 10 employees in 2010.

Although employer representatives and employees were interviewed our analysis is based on the employees' survey which contains information on multiple facets of employee

wellbeing.[4] Respondents are confined to those who have worked at least one and half year in their current employer before interview. The response rate to the employees' survey was approximately 50 per cent.

The dependent variables in the regression models describe different aspects of employee wellbeing. We use both global measures of employee wellbeing and measures that capture how workers feel about specific aspects of their jobs. The global satisfaction question is: "All in all, how satisfied are you with this job?", with responses measured on a four-point Likert scale from "Very dissatisfied" (coded 1) to "Very satisfied" (coded 4). A second global question asks: "In your current job, do you feel enthusiasm and joy from working?" with responses coded "a lot", "a fair amount", "some", "little" and "not at all".

The Meadow survey contains a number of specific questions about employee wellbeing in which respondents were asked to assess perceived working conditions at their workplace.[5] The answers were given on a scale from 4 to 10 (higher values meaning better wellbeing). We analyse the measures on the experience of achievement, joy of working, trust and co-operation, expertise, management and supervisory work, taking care of employees' interests, adoption of employees' ideas and initiatives, boldness to propose fresh ideas that improve work, and fostering fairness. We have rescaled all these variables so that they range from 0 to 6.

To evaluate the empirical validity of the Karasek model we consider the association between wellbeing and job control, job demands and organisational support. Job control is measured in terms of employees' influence over four aspects of their job, namely the tasks

[4] Sampling was such that, in the vast majority of cases, there is only one respondent per employer.

[5] The precise question is: "Please give a school grade (4-10) to your workplace on the following issues: Enthusiasm; Achievement; Joy of working; Trust and cooperation; Expertise; Management and supervisory work; Employee wellbeing; Employee care; Adoption of employees' ideas and initiatives; Daring to develop operations; Fostering fairness".

they perform, the pace of work, the order in which they carry out tasks, and the distribution of tasks among workers. The answers to these questions are available on a four-point Likert scale ("not at all" (coded 4), "some" (coded 3), "a fair amount" (coded 2) and "a lot" (coded 1)). We reversed the original values so that higher values mean better control and formed a standardized scale.[6] The scale has satisfactory Cronbach's alpha of 0.68.

Job demands are evaluated based on five separate questions. The first one asks "How often does your job involve working to tight deadlines or at very high speed?", measured as a fraction of total working time with four pre-coded responses: less than 25%, 25-50%, 51-74% and 75% or more. The second measure asks "How often do you carry out tasks related to your main job at home?", with alternatives "never", "occasionally", "frequently" and "I only work at home". The third measure asks "How often you carry out tasks related to your main job outside your actual hours of work?", with alternative responses "every day", "at least once a week", "at least once a month" and "less often than once a month/never. The fourth measure asks "How often are you contacted by phone or in person on work-related matters outside your usual working hours" with alternatives "every day", "at least once a week", "at least once a month" and "less often than once a month/never". The fifth measure is based on responses to the question "Over the past 12 months how many hours per month have you worked overtime or done extra work during an average month?". Responses are given in terms of numbers of hours. We have capped the number of overtime hours at 40 to reduce the impact of some very large values that are not consistent with the Finnish labour law. This affects 31 observations. Using these five items on job demands we create a standardized scale. The items are quite highly correlated. The scale has Cronbach's alpha of 0.73.

[6] See the Appendix for further details on how the standardised scales are created.

Organisational support is identified with a single question which asks: “In case of work overload or a difficult situation, do you receive assistance from...Your supervisor or manager; Your co-workers; Your clients or cooperation partners?” Pre-coded responses are “always”, “sometimes” and “never”. We form three different measures for job support. Supervisor support obtains the value of 1 if a worker obtains support from his/her supervisor or manager (otherwise 0). The variables for co-worker support and client or cooperation partner support are formed similarly.

The estimated models include the full set of interactions for job control, job demands and organisational support. We run a series of Ordinary Least Squares (OLS) regression models for each of the ten employee wellbeing measures described above in which we control for the standard determinants of employee wellbeing based on the empirical literature. We control for the income level using the residuals from a first-stage individual-level wage equation in which annual earnings are estimated based on age, gender and work experience. The controls also include age, gender, educational level (6 groups), occupation (10 groups), tenure (i.e. work experience at the current employer) and industry (15 groups). We also control for training during the past year. The aspects that are included cover employer-provided training, supplementary training in the context of job tasks, and employee’s independent training on work-related skills. To extrapolate the results to the population, we use survey weights that are calibrated and provided by Statistics Finland in all estimations. To account for the fact that there are a small number of workers who are employed in the same firms, the standard errors are clustered at the firm level.

The Meadow survey data are a cross-sectional and include only very limited self-reported information on labour market experience. To account for employee sorting into different

types of jobs we link the Meadow data to longitudinal register data from Statistics Finland.[7] The register data are the Finnish Longitudinal Employer–Employee Data (FLEED). The FLEED is constructed from a number of registers on individuals and firms that are maintained by Statistics Finland. We link the Meadow data and the FLEED by using unique personal identifiers (i.e. identification codes for individuals).

Using FLEED we have followed the employees that were included in the Meadow survey in 2012 over the period 2001–2011. The work history variables are the average earnings, the number of unemployment months and earnings growth during the past ten years. The past earnings data are introduced as the log of annual earnings. Earnings include the base wage, overtime pay, bonuses, and wage supplements.

4. RESULTS

Table 1 reports means and standard deviations for key data items in the analysis for the estimation sample. The ten outcome variables are all coded on a scale of zero to six. Job demands, job control and job support are composed of the items discussed in Section Three. For the purpose of analysis they are converted to standardized scores with a mean of zero and standard deviation of 1.[8] The table also shows means and standard deviations for control variables taken from the survey and the three work history variables derived from the administrative data.

[INSERT TABLE 1]

The raw correlations between these eight different job designs and worker wellbeing are presented in Table 2 for all ten wellbeing measures. Supervisor support is positively and significantly associated with all ten wellbeing measures. Job control is positively and

[7] For an earlier application of the same idea in the Finnish context, see Böckerman et al. (2013).
[8] Appendix Table A3 shows the incidence of jobs with all combinations of job support, control and demands in the data.

significantly associated with eight of them, and is on the borderline of statistical significance in the case of job satisfaction. In all cases the associations with supervisor support are stronger than they are with respect to job control. The raw correlations between job demands and wellbeing are not significant in any of the ten models. Where job demands are close to statistical significance – which is in the case of enthusiasm and initiative – the coefficient is positively signed. Indeed, it is positive (albeit insignificant) for five of the ten wellbeing measures. Of the forty interaction effects in Table 2, all but two are statistically non-significant. One would expect to find two significant coefficients among forty simply due to sampling variance.

[INSERT TABLE 2]

Table 3 shows what happens to these coefficients once we control for workers' demographic traits, the industry, workers' residual wages, and other characteristics of the job such as tenure and occupation. The controls make a substantial difference to the amount of variance in wellbeing accounted for by the model, as indicated by the increase in the adjusted r-squared relative to the models in Table 2. In the case of achievement, for example, the amount of variance accounted for almost doubles with the introduction of controls. However, in the case of fairness the additional controls contribute virtually nothing. The associations between supervisory support and wellbeing are robust to the inclusion of the controls, with both the coefficients and statistical significance of supervisory support of similar magnitude to the raw estimates. Similarly, associations between job control and wellbeing are largely unaffected by the introduction of controls, though the association with job satisfaction becomes statistically significant while the association with trust becomes non-significant. Job demands remain statistically non-

significant throughout and only one of the interaction effects is significant (the association between dare and the combination of supervisor support and job demands).

[INSERT TABLE 3]

Table 4 adds the work and earnings histories variables to the models presented in Table 3. There is a statistical justification for doing so since they contribute independently to the amount of variance in worker wellbeing accounted for by the models, albeit marginally.[9] Perhaps the most notable finding is the negative association between greater experience of unemployment in the previous ten years and worker wellbeing. It is negatively and statistically significantly associated with lower feelings of joy and trust and is on the margins of statistical significance for job satisfaction, enthusiasm and dare, even having accounted for job quality. This is clear evidence of the long-term scarring effects of unemployment on worker wellbeing, an effect that persists even having accounted for the potential impact such unemployment might have on the quality of job an individual can achieve in the future.

[INSERT TABLE 4]

Once one conditions on work and earnings histories the job design effects are broadly similar to those reported in Table 3, with supervisory support positive and statistically significant across the board, job control positive and significant for all wellbeing measures with the exception of achievement (which is nonetheless on the margins of significance) and job demands not significant throughout. The only significant interaction effect is that between supervisory support and job demands and dare.

[9] They are also independently and jointly statistically significant in accounting for variance in job demands, as indicated in Appendix Table A1.

As a robustness check we incorporated additional job-related controls capturing job and workplace features that have been emphasized as important for worker wellbeing in the human resource management (HRM) literature. These include methods of communication, incentive payments and team-working. The results reported above are not sensitive to the addition of these controls (see Appendix Table A2).

Employees may receive job support from people other than their supervisors. To see how that support is associated with worker wellbeing we replace supervisory support with support from co-workers in Table 5 and clients/business partners in Table 6. Although co-worker support is positive in all the wellbeing equations and statistically significant in six of the ten, the replacement of supervisory support by co-worker support leads to a large reduction in the explanatory power of the models compared to those containing supervisor support in Table 4. Furthermore, the coefficients for co-worker support are always smaller than those for supervisory support.

[INSERT TABLES 5-6]

The replacement of supervisor support by co-worker support also has implications for the role of job control. The coefficients on job control in Table 5 are generally smaller than they were in Table 4 and they are only statistically significant for four of the ten wellbeing measures. None of the interaction effects are statistically significant.

The association between client/business partner support and worker wellbeing is very different. It is never statistically significant alone (Table 6). However, its inclusion results in a stronger, more persistent effect of job control on worker wellbeing: job control is now positive and statistically significant across all ten wellbeing outcomes. Interaction effects also become significant: most notably the combination of job demands, job control and support from a client or business partner is significantly and negatively associated with

wellbeing on seven of the ten wellbeing outcomes and is on the verge of statistical significance in two others'.

5. CONCLUSIONS

It is well-established in the psychology, labour economics and HRM literatures that job design is strongly correlated with worker wellbeing. The literature has tended to focus on those aspects of job design featuring in Karasek's (1979) and Karasek and Theorell's (1990) models, with much less attention devoted to other aspects of job design. Furthermore, the literature has paid little attention to non-random selection of workers into jobs. We address both of these issues using linked employer-employee data for Finland. Although results differ somewhat across different wellbeing outcomes we find broad support for Karasek's (1979) proposition that job control is positively correlated with worker wellbeing. However, contrary to the Karasek model job demands have no adverse effects on worker wellbeing and we find no evidence that job control mitigates any adverse effects of job demands. Furthermore, we find a strong positive correlation between job support and all aspects of worker wellbeing that is independent of job controls and job demands, a finding that has not been emphasized in the literature. The effects are most pronounced in relation to supervisor support, are still apparent in most cases with respect to co-worker support, but are largely absent with respect to the support of clients and business partners. We also find evidence of unemployment scarring effects: substantial experience of unemployment has long-term consequences for the wellbeing workers experience in their current jobs, even controlling for the quality of those jobs.

Our findings differ somewhat from the broad thrust of the empirical literature reviewed in Section Two. Although we are the first to account for selection into different types of jobs using work history variables the introduction of these controls does not account for these

differences. There are a number of reasons why they may differ. First, ours is the first paper to present results for a country (Finland) where unionization rates are high – considerably higher than in the Anglo-US countries which feature heavily in the empirical literature. It may be that the influence of unions on the nature of job design, and the nature of social support at work, could affect the associations between worker wellbeing and job design. Second, our measures of job control, job demands and job support differ from other studies. However, the definition of these concepts tends to differ across most studies and, in any case, our survey measures are fairly complete compared to those featuring in other studies. Furthermore, our results are relatively insensitive to the configuration of variables used to construct these items.[10] Third, we present results for ten wellbeing outcomes. Most studies tend to concentrate on one or two, with job satisfaction featuring in most. Although our results are fairly consistent across wellbeing measures, they do differ for specific wellbeing measures in some specifications. Taking job satisfaction as an example, although support is consistently positively and significantly associated with supervisor and co-worker support, it is not associated with client or partner support. Job control is generally significantly and positively associated with job satisfaction, but it is not significant in the models presented in Tables 2 and 5. The implication is that results will vary, even within study, according to model specification and the construction of variables used to capture key concepts. In future, analysts would do well to test the Karasek model using very similar model specifications and derived variables across a range of wellbeing measures in different institutional contexts to see what more we can learn about the links between job design and worker wellbeing.

[10] Some of these sensitivity checks are reported in Appendix Tables A4 and A5. Others are available from the authors on request.

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Tables

Table 1: Summary statistics

Variable	Observations	Mean	Std. Dev.
Outcomes			
Job satisfaction	1,677	3.05	0.59
Enthusiasm	1,671	3.75	1.06
Achievement	1,672	4.10	0.96
Joy	1,673	3.91	1.17
Trust	1,670	4.03	1.24
Skills	1,672	4.56	0.86
Management	1,665	3.55	1.32
Wellbeing	1,673	3.75	1.18
Personnel care	1,668	3.64	1.30
Initiative	1,658	3.55	1.16
Dare	1,668	3.87	1.13
Fairness	1,673	3.77	1.28
Job Control, Job Demands, Support			
Job control	1,660	4E-09	1
Job demands	1,645	3E-09	1
Supervisor support	1,680	0.42	0.49
Coworker support	1,680	0.64	0.48
Client or cooperation partner support	1,680	0.18	0.39
Control variables			
Standardized wage	1,680	-0.02	0.57
Age	1,680	44.19	11.56
Female	1,680	0.44	0.50
Level of education			
Primary education	1,680	0.15	0.36
Secondary education	1,680	0.53	0.50
Lowest level tertiary	1,680	0.13	0.34
Bachelor's or equivalent	1,680	0.11	0.32
Master's or equivalent	1,680	0.07	0.25
Doctoral or equivalent	1,680	0.01	0.08
Occupation			
Armed forces	1,643	0.00	0.03
Managers	1,643	0.01	0.10
Professionals	1,643	0.19	0.39
Technicians and associate professionals	1,643	0.19	0.39
Clerical support workers	1,643	0.07	0.25
Service and sales workers	1,643	0.17	0.38
Skilled agricultural, forestry and fishery workers6	1,643	0.01	0.08
Craft and related trades workers	1,643	0.17	0.38
Plant and machine operators, and assemblers	1,643	0.11	0.31
Elementary occupations	1,643	0.08	0.28

Tenure	1,669	10.02	8.35
Training	1,677	0.74	0.44
Job history			
Log average income in the past ten years	1,680	7.70	0.59
Unemployment during the past ten years	1,680	0.40	0.98
Average wage growth during the last ten years	1,680	0.17	0.35

Table 2: Job control, Job demands and supervisor support: No control variables

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job control	0.094	0.295***	0.086	0.262***	0.192*	0.061	0.273**	0.229**	0.262***	0.289***
	(1.954)	(3.903)	(1.396)	(3.458)	(2.308)	(0.995)	(2.769)	(2.665)	(3.704)	(3.535)
Job demands	-0.049	0.116	0.021	0.013	0.074	-0.006	-0.015	-0.050	0.097	-0.001
	(-1.390)	(1.777)	(0.329)	(0.160)	(0.932)	(-0.103)	(-0.170)	(-0.739)	(1.585)	(-0.010)
Job control*Job demands	0.028	-0.006	0.112	0.011	0.090	0.109	0.068	0.082	0.016	0.088
	(0.770)	(-0.088)	(1.903)	(0.145)	(1.192)	(1.516)	(0.706)	(1.188)	(0.267)	(1.051)
Supervisor support	0.269***	0.533***	0.391***	0.621***	0.762***	0.399***	0.913***	0.964***	0.647***	0.920***
	(5.555)	(6.183)	(4.426)	(6.136)	(7.301)	(4.978)	(8.281)	(8.972)	(7.006)	(8.451)
Supervisor support*Job control	0.018	-0.168	-0.023	-0.032	-0.164	-0.081	-0.230	-0.067	-0.104	-0.259*
	(0.314)	(-1.551)	(-0.243)	(-0.292)	(-1.443)	(-0.963)	(-1.907)	(-0.596)	(-1.061)	(-2.464)
Supervisor support*Job demands	0.102*	-0.063	-0.053	0.081	-0.123	0.034	-0.080	0.061	-0.095	-0.014
	(2.117)	(-0.646)	(-0.613)	(0.814)	(-1.182)	(0.457)	(-0.721)	(0.633)	(-0.978)	(-0.119)
Supervisor support*Job demands*Job control	-0.052	0.051	-0.110	-0.099	-0.051	-0.048	0.002	-0.059	-0.046	-0.077
	(-1.110)	(0.493)	(-1.383)	(-0.991)	(-0.485)	(-0.588)	(0.020)	(-0.667)	(-0.440)	(-0.681)
Adjusted R^2	0.102	0.146	0.055	0.134	0.126	0.061	0.160	0.180	0.134	0.172
N	1625	1623	1625	1623	1623	1623	1616	1622	1611	1623

Notes: *p<0.05; ** p<0.01; *** p<0.001

Table 3: Job control, Job demands and supervisor support: with control variables

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job control	0.094*	0.291***	0.109	0.282***	0.159	0.044	0.205*	0.196*	0.260***	0.228**
	(2.098)	(4.075)	(1.698)	(3.897)	(1.888)	(0.795)	(2.216)	(2.306)	(3.797)	(2.744)
Job demands	-0.027	0.125	0.074	0.032	0.048	0.001	0.057	-0.056	0.064	-0.023
	(-0.726)	(1.718)	(1.064)	(0.378)	(0.571)	(0.023)	(0.656)	(-0.793)	(0.979)	(-0.283)
Job control*Job demands	0.046	0.033	0.087	0.046	0.085	0.034	0.048	0.064	0.037	0.066
	(1.255)	(0.496)	(1.600)	(0.634)	(1.169)	(0.705)	(0.595)	(1.094)	(0.639)	(0.937)
Supervisor support	0.292***	0.494***	0.377***	0.634***	0.776***	0.369***	0.898***	0.879***	0.640***	0.883***
	(5.486)	(5.518)	(3.912)	(5.865)	(7.284)	(4.497)	(8.384)	(8.350)	(6.841)	(8.176)
Supervisor support*Job control	-0.013	-0.168	-0.084	-0.078	-0.120	-0.065	-0.198	-0.075	-0.120	-0.176
	(-0.243)	(-1.618)	(-0.932)	(-0.718)	(-1.141)	(-0.890)	(-1.856)	(-0.717)	(-1.310)	(-1.687)
Supervisor support*Job demands	0.086	-0.036	-0.050	0.081	-0.131	0.046	-0.102	0.073	-0.055	0.019
	(1.676)	(-0.362)	(-0.533)	(0.816)	(-1.302)	(0.655)	(-0.959)	(0.768)	(-0.572)	(0.171)
Supervisor support*Job demands*Job control	-0.074	0.015	-0.089	-0.140	-0.066	-0.008	0.003	-0.029	-0.069	-0.088
	(-1.561)	(0.153)	(-1.176)	(-1.538)	(-0.627)	(-0.120)	(0.033)	(-0.372)	(-0.692)	(-0.828)
Adjusted R^2	0.159	0.184	0.099	0.206	0.154	0.109	0.179	0.209	0.183	0.178
N	1577	1574	1576	1574	1574	1574	1568	1573	1562	1574

Notes: *p<0.05; ** p<0.01; *** p<0.001. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation (9 categories).

Table 4: Job control, Job demands and supervisor support: Control variables and labor market history

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job control	0.095*	0.289***	0.111	0.288***	0.162*	0.045	0.200*	0.198*	0.255***	0.224**
	(2.185)	(4.073)	(1.720)	(3.988)	(1.971)	(0.807)	(2.151)	(2.360)	(3.761)	(2.718)
Job demands	-0.029	0.125	0.071	0.021	0.043	-0.001	0.064	-0.057	0.070	-0.018
	(-0.775)	(1.754)	(1.046)	(0.250)	(0.526)	(-0.026)	(0.735)	(-0.814)	(1.110)	(-0.215)
Job control*Job demands	0.045	0.023	0.086	0.040	0.074	0.033	0.042	0.062	0.029	0.061
	(1.236)	(0.356)	(1.577)	(0.547)	(1.040)	(0.691)	(0.531)	(1.057)	(0.504)	(0.873)
Supervisor support	0.290***	0.495***	0.377***	0.632***	0.773***	0.369***	0.900***	0.874***	0.642***	0.883***
	(5.422)	(5.568)	(3.878)	(5.981)	(7.360)	(4.485)	(8.379)	(8.332)	(6.903)	(8.153)
Supervisor support*Job control	-0.016	-0.162	-0.086	-0.080	-0.124	-0.065	-0.191	-0.082	-0.113	-0.174
	(-0.311)	(-1.593)	(-0.951)	(-0.746)	(-1.188)	(-0.870)	(-1.779)	(-0.785)	(-1.279)	(-1.659)
Supervisor support*Job demands	0.083	-0.039	-0.051	0.074	-0.142	0.046	-0.100	0.066	-0.057	0.018
	(1.594)	(-0.380)	(-0.554)	(0.761)	(-1.411)	(0.654)	(-0.921)	(0.697)	(-0.586)	(0.153)
Supervisor support*Job demands*Job control	-0.070	0.018	-0.087	-0.130	-0.053	-0.007	-0.000	-0.022	-0.070	-0.089
	(-1.463)	(0.177)	(-1.152)	(-1.460)	(-0.521)	(-0.109)	(-0.005)	(-0.275)	(-0.711)	(-0.814)
Log average income in the past ten years	-0.028	-0.206	0.014	-0.038	-0.224	0.018	-0.170	-0.082	-0.257	-0.176
	(-0.443)	(-1.420)	(0.106)	(-0.253)	(-1.734)	(0.162)	(-0.968)	(-0.624)	(-1.601)	(-1.296)
Unemployment during the past ten years	-0.040	-0.076	-0.021	-0.100*	-0.174**	-0.001	-0.014	-0.088	-0.065	-0.047
	(-1.615)	(-1.653)	(-0.474)	(-2.024)	(-2.603)	(-0.025)	(-0.208)	(-1.445)	(-1.121)	(-0.794)
Wage growth during the last ten years	-0.043	0.187	0.057	0.355*	0.119	0.113	-0.007	-0.148	-0.025	-0.124
	(-0.519)	(1.046)	(0.294)	(2.060)	(0.535)	(0.896)	(-0.035)	(-0.757)	(-0.124)	(-0.581)
Adjusted R^2	0.161	0.194	0.098	0.216	0.171	0.109	0.180	0.211	0.188	0.179

N	1577	1574	1576	1574	1574	1574	1568	1573	1562	1574

Notes: *p<0.05; ** p<0.01; *** p<0.001. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation (9 categories).

Table 5: Job control, Job demands and coworker support: Control variables and labor market history

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job control	0.091	0.244**	0.144	0.287**	0.101	0.017	0.171	0.272*	0.229**	0.170
	(1.429)	(2.659)	(1.789)	(2.955)	(0.895)	(0.221)	(1.388)	(2.339)	(2.879)	(1.312)
Job demands	-0.004	0.138	0.092	0.075	0.101	0.038	0.073	0.001	0.054	0.051
	(-0.089)	(1.498)	(1.276)	(0.681)	(0.935)	(0.614)	(0.647)	(0.007)	(0.653)	(0.435)
Job control*Job demands	0.035	0.039	0.049	0.079	0.049	0.047	0.048	0.028	-0.090	0.022
	(0.882)	(0.456)	(0.740)	(0.815)	(0.443)	(0.723)	(0.468)	(0.371)	(-1.020)	(0.193)
Coworker support	0.115*	0.140	0.191*	0.308**	0.462***	0.180*	0.216	0.255*	0.076	0.417**
	(2.030)	(1.528)	(2.136)	(2.641)	(3.699)	(2.188)	(1.736)	(2.024)	(0.746)	(3.197)
Coworker support*Job control	0.032	0.031	-0.054	0.019	0.101	0.043	0.054	-0.036	0.074	0.077
	(0.467)	(0.284)	(-0.563)	(0.167)	(0.818)	(0.507)	(0.397)	(-0.275)	(0.733)	(0.545)
Coworker support*Job demands	-0.002	-0.049	-0.076	-0.052	-0.182	-0.032	-0.092	-0.063	-0.059	-0.113
	(-0.036)	(-0.457)	(-0.836)	(-0.417)	(-1.531)	(-0.461)	(-0.719)	(-0.624)	(-0.592)	(-0.866)
Coworker support*Job demands*Job control	-0.024	-0.027	-0.029	-0.150	-0.034	-0.023	-0.041	0.023	0.112	-0.018
	(-0.480)	(-0.245)	(-0.359)	(-1.353)	(-0.267)	(-0.306)	(-0.333)	(0.241)	(1.102)	(-0.135)
Log average income in the past ten years	-0.035	-0.230	-0.006	-0.063	-0.282	-0.003	-0.202	-0.104	-0.267	-0.220
	(-0.502)	(-1.596)	(-0.045)	(-0.433)	(-1.948)	(-0.032)	(-1.266)	(-0.761)	(-1.813)	(-1.501)
Unemployment during the past ten years	-0.042	-0.072	-0.018	-0.100*	-0.167*	-0.000	-0.012	-0.091	-0.069	-0.044
	(-1.650)	(-1.525)	(-0.426)	(-2.020)	(-2.353)	(-0.009)	(-0.161)	(-1.352)	(-1.089)	(-0.692)
Wage growth during the last ten years	-0.053	0.172	0.052	0.342	0.087	0.097	-0.022	-0.178	-0.046	-0.154
	(-0.610)	(0.846)	(0.255)	(1.840)	(0.371)	(0.716)	(-0.096)	(-0.798)	(-0.235)	(-0.628)
Adjusted R^2	0.114	0.142	0.072	0.168	0.108	0.075	0.071	0.115	0.122	0.092

N	1577	1574	1576	1574	1574	1574	1568	1573	1562	1574

Notes: *p<0.05; ** p<0.01; *** p<0.001. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation (9 categories).

Table 6: Job control, Job demands and client or business partner support: Control variables and labor market history

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job control	0.117***	0.286***	0.117*	0.347***	0.205**	0.045	0.217**	0.230***	0.266***	0.228***
	(3.963)	(4.794)	(2.189)	(5.878)	(3.043)	(0.992)	(2.973)	(3.511)	(4.828)	(3.571)
Job demands	-0.014	0.120	0.022	0.009	-0.043	0.026	-0.027	-0.046	0.017	-0.031
	(-0.426)	(1.863)	(0.418)	(0.137)	(-0.642)	(0.594)	(-0.375)	(-0.769)	(0.283)	(-0.427)
Job control*Job demands	0.036	0.076	0.042	0.031	0.092	0.047	0.093	0.114*	0.035	0.083
	(1.338)	(1.210)	(0.921)	(0.511)	(1.465)	(1.242)	(1.464)	(2.289)	(0.604)	(1.231)
Client or business partner support	-0.005	0.055	0.017	0.133	-0.020	-0.022	-0.016	-0.046	0.149	-0.031
	(-0.062)	(0.460)	(0.143)	(1.164)	(-0.123)	(-0.198)	(-0.095)	(-0.265)	(1.046)	(-0.194)
Client or business partner support*Job control	0.056	0.006	0.016	-0.078	0.078	0.106	0.165	0.297	0.135	0.251
	(0.585)	(0.042)	(0.112)	(-0.662)	(0.484)	(0.824)	(0.841)	(1.482)	(0.810)	(1.439)
Client or business partner support*Job demands	0.020	-0.078	0.030	0.042	0.056	-0.077	0.189	0.006	0.034	-0.016
	(0.294)	(-0.579)	(0.243)	(0.330)	(0.336)	(-0.794)	(1.123)	(0.051)	(0.282)	(-0.107)
Client or business partner support*Job demands*Job control	-0.093	-0.218	-0.043	-0.203*	-0.321*	-0.082	-0.397**	-0.352**	-0.262*	-0.367**
	(-1.675)	(-1.958)	(-0.426)	(-2.043)	(-2.455)	(-0.905)	(-2.780)	(-3.151)	(-2.417)	(-2.854)
Log average income in the past ten years	-0.016	-0.199	0.018	-0.016	-0.203	0.021	-0.153	-0.059	-0.243	-0.153
	(-0.233)	(-1.412)	(0.135)	(-0.104)	(-1.269)	(0.214)	(-0.996)	(-0.432)	(-1.720)	(-1.069)
Unemployment during the past ten years	-0.045	-0.074	-0.022	-0.104*	-0.176*	-0.006	-0.017	-0.100	-0.068	-0.055
	(-1.795)	(-1.556)	(-0.502)	(-1.969)	(-2.309)	(-0.121)	(-0.232)	(-1.489)	(-1.075)	(-0.858)
Wage growth during the last ten years	-0.044	0.202	0.054	0.371	0.136	0.103	0.011	-0.161	-0.027	-0.123

	(-0.518)	(0.994)	(0.272)	(1.851)	(0.543)	(0.773)	(0.047)	(-0.712)	(-0.136)	(-0.501)
Adjusted R^2	0.109	0.148	0.062	0.159	0.085	0.070	0.080	0.120	0.127	0.083
N	1577	1574	1576	1574	1574	1574	1568	1573	1562	1574

Notes: *p<0.05; ** p<0.01; *** p<0.001. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation (9 categories).

SUPPLEMENTARY ONLINE APPENDIX

Job control

The measure of job control is based on the following questions

25. Do you have 1) a lot of, 2) a fair amount of, 3) some, 4) not at all influence on the following issues?

a. which tasks your work consists of
b. your working pace
c. in which order you carry out tasks
d. how tasks are distributed among employees at work

We form a standardized scale of questions Q25a Q25b Q25c Q25d (reversing the values so that higher values mean better control). The scale has Cronbach's alpha of 0.68. Because the estimation use weights we further subtract the weighted mean and divide by the weighted standard deviation so that the scale has zero mean and standard deviation of 1 also in the estimations.

Job demands

We use the following questions to form a standardized scale

16. How often does your job involve working to tight deadlines or at very high speed?
1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

17. How often you carry out tasks related to your main job at home?
1. Never
2. Occasionally
3. Frequently
4. I only work at home.

18. How often you carry out tasks related to your main outside your actual hours of work?
1. every day
2. at least once a week
3. at least once a month
4. less often than once a month/never
5. not applicable

19. How often are you contacted by phone or in person on work related matters outside your usual working hours?
1. Every day
2. At least once a week
3. At least once a month
4. Less often than once a month / never

42. Over the past 12 months how many hours per month have you worked overtime or done extra work during an average month?

The standardized scale is formed in the following way Q16+A17+Q18+Q19+Q42. In the overtime question the number of overtime hours has been capped at 40 reduce some very large values. This affects 31 observations. These items are quite highly correlated and the scale has Cronbach's alpha (0.73). Because the estimation use weights we further subtract the weighted mean and divide by the weighted standard deviation so that the scale has zero mean and standard deviation of 1 also in the estimations.

Job Support

Job support is measured with a single question

13. In case of work overload or a difficult situation, do you receive assistance from
1. Always; 2. Sometimes; 3. Never; 4. Not applicable

a. Your supervisor or manager
b. Your coworkers
c. Your clients or cooperation partners

We form three different measures of support.
Supervisor support=1 if Q13a==1 and 0 otherwise
Coworker support=1 if Q13b==1 and 0 otherwise

Client or cooperation partner support=1 if Q13c==1 and 0 otherwise

Table A1: Job Control, Job Demands, Job Support, and Labor market history

	Job Control	Job Demands	Supervisor support	Coworker support	Client or business partner support
Log average income in the past ten years	-0.121	0.294**	-0.038	0.065	0.016
	(-0.968)	(3.044)	(-0.507)	(0.938)	(0.385)
Unemployment during the past ten years	0.009	-0.069*	-0.015	-0.021	-0.022
	(0.211)	(-2.060)	(-0.606)	(-0.813)	(-1.266)
Wage growth during the last ten years	-0.191	0.372*	-0.123	-0.059	0.035
	(-1.071)	(2.489)	(-1.199)	(-0.677)	(0.556)
Adjusted R^2	0.104	0.278	0.039	0.051	0.107
N	1610	1595	1629	1629	1629

Notes: *p<0.05; ** p<0.01; *** p<0.001. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation (9 categories).

Table A2: Job control, Job demands and supervisor support: Additional control variables and labor market history

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job control	0.100*	0.279***	0.098	0.259***	0.119	0.001	0.153	0.127	0.222***	0.148
	(2.394)	(3.976)	(1.499)	(3.416)	(1.434)	(0.023)	(1.691)	(1.562)	(3.371)	(1.853)
Job demands	-0.028	0.143*	0.068	0.025	0.057	0.009	0.064	-0.067	0.076	-0.013
	(-0.749)	(2.065)	(0.942)	(0.305)	(0.709)	(0.170)	(0.722)	(-0.962)	(1.173)	(-0.167)
Job control*Job demands	0.049	0.025	0.095	0.057	0.070	0.027	0.040	0.077	0.034	0.066
	(1.315)	(0.398)	(1.719)	(0.815)	(0.996)	(0.563)	(0.517)	(1.328)	(0.578)	(0.954)
Supervisor support	0.278***	0.501***	0.372***	0.625***	0.788***	0.359***	0.900***	0.874***	0.645***	0.902***
	(5.328)	(5.643)	(3.806)	(5.712)	(7.487)	(4.372)	(8.433)	(8.472)	(6.899)	(8.454)
Supervisor support*Job control	-0.015	-0.146	-0.078	-0.063	-0.085	-0.048	-0.166	-0.017	-0.062	-0.076
	(-0.287)	(-1.452)	(-0.866)	(-0.588)	(-0.871)	(-0.614)	(-1.561)	(-0.164)	(-0.688)	(-0.739)
Supervisor support*Job demands	0.076	-0.042	-0.051	0.092	-0.141	0.009	-0.117	0.059	-0.032	0.052
	(1.492)	(-0.419)	(-0.527)	(0.914)	(-1.414)	(0.125)	(-1.080)	(0.622)	(-0.321)	(0.468)
Supervisor support*Job demands*Job control	-0.060	0.013	-0.111	-0.156	-0.048	-0.002	0.030	-0.032	-0.081	-0.107
	(-1.211)	(0.128)	(-1.469)	(-1.820)	(-0.478)	(-0.034)	(0.311)	(-0.403)	(-0.787)	(-1.038)
Log average income in the past ten years	0.002	-0.151	0.089	0.007	-0.189	0.040	-0.081	-0.016	-0.231	-0.098
	(0.032)	(-1.007)	(0.678)	(0.043)	(-1.468)	(0.349)	(-0.446)	(-0.111)	(-1.322)	(-0.703)
Unemployment during the past ten years	-0.045	-0.060	0.000	-0.073	-0.172*	-0.012	-0.022	-0.093	-0.079	-0.043
	(-1.911)	(-1.225)	(0.002)	(-1.575)	(-2.468)	(-0.230)	(-0.315)	(-1.430)	(-1.364)	(-0.739)
Wage growth during the last ten years	-0.076	0.181	0.092	0.371*	0.074	0.103	-0.044	-0.235	-0.114	-0.212
	(-0.878)	(1.013)	(0.487)	(2.086)	(0.331)	(0.816)	(-0.220)	(-1.200)	(-0.577)	(-1.038)

Adjusted R^2	0.184	0.222	0.130	0.230	0.190	0.115	0.197	0.231	0.201	0.212
N	1438	1435	1436	1435	1435	1434	1429	1435	1424	1434

Notes: *p<0.05; ** p<0.01; *** p<0.001. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation(9 categories). The additional control variables are the shares of employees in the firm participating in i) self-managed teams, ii) regular meetings with supervisors, iii) flexible working time arrangements, iv) employer-provided training, v) performance evaluation schemes, vi) work development initiatives, and vii) telecommuting.

Table A3 :Prevalence of different combinations of Control Demand and Support

Job Control #Job Demands# Supervisor support	
001	0,23
010	0,06
011	0,10
100	0,11
101	0,05
110	0,05
111	0,03
N	1680

Table A4: Job control, Job demands and supervisor support as dichotomous variables: Control variables and labor market history

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job Control #Job Demands# Supervisor support										
0 0 1	0.285***	0.733***	0.415***	0.704***	0.952***	0.402***	1.009***	0.997***	0.778***	1.057***
	(4.703)	(6.934)	(3.813)	(5.708)	(7.592)	(4.259)	(7.479)	(8.455)	(6.912)	(8.373)
0 1 0	0.323***	0.883***	0.399*	0.778***	0.523*	0.270*	0.700**	0.621*	0.817***	0.809***
	(3.370)	(6.139)	(2.495)	(3.311)	(1.967)	(1.992)	(3.014)	(2.343)	(4.874)	(3.961)
0 1 1	0.403***	0.853***	0.526***	0.969***	0.948***	0.281*	1.133***	0.912***	1.066***	1.152***
	(4.843)	(5.048)	(3.889)	(6.408)	(6.166)	(2.157)	(6.382)	(4.062)	(7.144)	(7.201)
1 0 0	-0.091	0.225	0.056	-0.158	-0.118	-0.028	-0.088	-0.228	-0.020	-0.118
	(-0.759)	(1.257)	(0.392)	(-0.699)	(-0.527)	(-0.199)	(-0.413)	(-1.158)	(-0.130)	(-0.545)
1 0 1	0.403***	0.720***	0.396*	0.922***	0.686***	0.455***	0.861***	0.963***	0.689**	0.683**
	(3.596)	(4.139)	(2.234)	(5.568)	(4.145)	(3.822)	(4.422)	(3.934)	(2.995)	(2.783)
1 1 0	-0.018	0.795***	0.170	0.246	-0.051	-0.081	0.053	0.001	0.274	0.238
	(-0.101)	(4.434)	(0.442)	(1.048)	(-0.151)	(-0.336)	(0.138)	(0.003)	(0.922)	(0.808)
1 1 1	0.490***	1.285***	0.665**	0.906***	0.694*	0.476**	1.180***	1.190***	0.792**	1.093***
	(3.748)	(5.105)	(3.043)	(4.084)	(2.393)	(3.042)	(4.867)	(5.190)	(2.660)	(4.048)
Log average income in the past ten years	-0.071	-0.278*	-0.027	-0.136	-0.347*	0.009	-0.258	-0.191	-0.283	-0.221
	(-0.983)	(-2.028)	(-0.204)	(-0.937)	(-2.334)	(0.089)	(-1.595)	(-1.466)	(-1.836)	(-1.614)
Unemployment during the past ten years	-0.055*	-0.101*	-0.039	-0.129*	-0.195**	0.001	-0.038	-0.108	-0.075	-0.056
	(-2.149)	(-2.249)	(-0.903)	(-2.472)	(-2.757)	(0.015)	(-0.567)	(-1.792)	(-1.381)	(-0.957)
Wage growth during the last ten years	-0.091	0.148	0.027	0.276	0.012	0.155	-0.045	-0.217	0.007	-0.104
	(-1.043)	(0.833)	(0.138)	(1.548)	(0.055)	(1.300)	(-0.218)	(-1.109)	(0.037)	(-0.493)
Adjusted R^2	0.152	0.212	0.104	0.208	0.181	0.116	0.188	0.217	0.189	0.196
N	1627	1620	1621	1622	1619	1621	1615	1617	1608	1622

Notes: *p<0.05; ** p<0.01; *** p<0.001. In the table Job Control and Job Demand are represented as dichotomous varibles, where they equal 1 if the standardized scale in Table 3 is greater than the 75th percentile of the variable in question. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation (9 categories).

Table A5: Job control, Job demands and supervisor support: Control variables and labor market history

Variable	Job satisfaction	Enthusiasm	Achievement	Joy	Trust	Skills	Manage-ment	Personnel care	Initiative	Fairness
Job control	-0.138	0.784*	-0.327	0.229	0.080	-0.369	0.167	-0.040	-0.101	-0.043
	(-1.153)	(2.378)	(-0.953)	(1.010)	(0.258)	(-1.541)	(0.507)	(-0.242)	(-0.421)	(-0.288)
Job demands	-0.035	-0.172	-0.381	-0.387**	-0.517**	-0.161	-0.533**	-0.183	-0.158	-0.336
	(-0.477)	(-1.283)	(-1.576)	(-3.042)	(-2.715)	(-0.778)	(-3.246)	(-1.538)	(-0.806)	(-1.897)
Job control*Job demands	0.247**	-0.024	0.094	-0.302*	0.068	0.053	-0.230	0.290**	0.351*	0.139
	(2.900)	(-0.124)	(0.393)	(-2.093)	(0.351)	(0.277)	(-1.211)	(3.096)	(2.115)	(1.021)
Supervisor support (sometimes)	0.199	0.330	0.935*	0.686*	0.947*	0.526	1.045**	1.122***	1.072***	0.931**
	(1.201)	(1.279)	(2.471)	(2.140)	(2.337)	(1.741)	(2.948)	(4.757)	(3.532)	(3.064)
Supervisor support (always)	0.490**	0.772**	1.259**	1.279***	1.678***	0.867**	1.867***	1.928***	1.650***	1.764***
	(3.026)	(3.045)	(3.291)	(4.002)	(4.147)	(2.839)	(5.282)	(8.185)	(5.415)	(5.894)
Supervisor support (sometimes)*Job control	0.264*	-0.540	0.481	0.039	0.079	0.476	0.013	0.232	0.373	0.271
	(2.046)	(-1.602)	(1.392)	(0.164)	(0.247)	(1.956)	(0.038)	(1.254)	(1.505)	(1.553)
Supervisor support (always)*Job control	0.215	-0.651	0.371	-0.005	-0.026	0.354	-0.133	0.171	0.252	0.108
	(1.722)	(-1.908)	(1.075)	(-0.021)	(-0.081)	(1.467)	(-0.394)	(0.947)	(1.019)	(0.646)
Supervisor support (sometimes)*Job demands	0.021	0.317*	0.500*	0.451**	0.623**	0.191	0.642***	0.165	0.266	0.364
	(0.246)	(2.046)	(1.986)	(2.922)	(2.999)	(0.897)	(3.515)	(1.223)	(1.309)	(1.851)
Supervisor support (always)*Job demands	0.090	0.255	0.395	0.481***	0.416*	0.196	0.491**	0.209	0.178	0.344
	(1.123)	(1.654)	(1.579)	(3.504)	(2.086)	(0.928)	(2.755)	(1.567)	(0.854)	(1.732)
Supervisor support (sometimes)*Job demands*Job control	-0.216*	0.092	-0.019	0.420*	0.051	0.009	0.316	-0.203	-0.348	-0.052
	(-2.277)	(0.448)	(-0.078)	(2.552)	(0.244)	(0.043)	(1.541)	(-1.740)	(-1.957)	(-0.328)

Supervisor support (always)*Job demands*Job control	-0.274**	0.067	-0.089	0.218	-0.042	-0.020	0.278	-0.252*	-0.389*	-0.164
	(-2.944)	(0.319)	(-0.366)	(1.389)	(-0.203)	(-0.099)	(1.402)	(-2.243)	(-2.099)	(-1.010)
Log average income in the past ten years	-0.035	-0.187	0.006	-0.039	-0.231	0.023	-0.161	-0.085	-0.260	-0.183
	(-0.535)	(-1.286)	(0.047)	(-0.270)	(-1.752)	(0.206)	(-0.924)	(-0.657)	(-1.557)	(-1.327)
Unemployment during the past ten years	-0.045	-0.066	-0.011	-0.092	-0.166*	0.007	0.001	-0.079	-0.055	-0.042
	(-1.827)	(-1.462)	(-0.253)	(-1.914)	(-2.498)	(0.154)	(0.016)	(-1.276)	(-0.956)	(-0.701)
Wage growth during the last ten years	-0.031	0.175	0.044	0.308	0.096	0.115	-0.054	-0.194	-0.043	-0.159
	(-0.363)	(0.973)	(0.236)	(1.806)	(0.435)	(0.927)	(-0.268)	(-0.989)	(-0.208)	(-0.726)
Adjusted R^2	0.178	0.218	0.145	0.250	0.210	0.136	0.224	0.239	0.213	0.201
N	1555	1552	1554	1553	1553	1553	1549	1554	1543	1554

Notes: *p<0.05; ** p<0.01; *** p<0.001. Variables included in the regressions but not reported in the tables include standardized income, industry (14 categories), age, age squared, tenure, tenure squared, training dummy, female, level of education (5 categories) and occupation (9 categories).