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Outsourcing, Occupational Restructuring, and Employee Well-Being: Is There a Silver Lining?

Petri Böckerman
Mika Maliranta

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Forschungsinstitut
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Institute for the Study
of Labor

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Petri Böckerman
Labour Institute for Economic Research and IZA

Mika Maliranta
Research Institute of the Finnish Economy

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

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ABSTRACT

Outsourcing, Occupational Restructuring, and Employee Well-Being: Is There a Silver Lining?*

This paper examines the relationship between outsourcing and various aspects of employee well-being by devoting special attention to the role of occupational restructuring as a conveying mechanism. Using linked employer-employee data, we find that offshoring involves job destruction, especially when the destination is a low-wage country. In such circumstances, staying employees' job satisfaction is reduced. However, the relationship between outsourcing and employee well-being is not entirely negative. Our evidence also shows that offshoring to high-wage countries stimulates the vertical mobility of employees in affected firms in a manner that improves perceived well-being, particularly in terms of better prospects for promotion.

JEL Classification: J28, F23

Keywords: globalization, outsourcing, offshoring, downsizing, working conditions, subjective well-being, job satisfaction

Corresponding author:

Petri Böckerman
Labour Institute for Economic Research
Pitkänsillanranta 3A
FI-00530, Helsinki
Finland
E-mail: petri.bockerman@labour.fi

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Introduction

Outsourcing comprises domestic outsourcing (i.e., moving business functions to another firm within the home country) and offshoring[1] (i.e., international outsourcing), in which business functions move abroad. Outsourcing may have a profound effect on the occupational structures of firms because it involves both job and worker flows. These changes have significant effects on the perceived well-being of a firm's employees because restructuring implies changes in the work environment that directly affect the utility of employees.[2]

Outsourcing has had a considerable effect on the labor market outcomes in developed countries (Acemoglu and Autor 2011). However, the destination of outsourcing may have a significant effect on these outcomes, whether between domestic or foreign firms or between different foreign countries (e.g., low-wage versus high-wage countries). There is a growing body of literature on how offshoring has affected occupational and task structures (e.g., Criscuolo and Garicano 2010; Kemeny and Rigby 2012; Liu and Trefler 2008).[3] But less is known about the micro-level dynamics of occupational restructuring, which include job and worker flows at the level of firms and occupations (e.g., Hummels et al. 2011). The literature concerning the effects of offshoring on employee well-being is even thinner (e.g., Maertz et al. 2009; Geishecker et al. 2012), and the role of micro-level dynamics in occupational restructuring is essentially unexplored. This lack of research is unfortunate because an in-depth analysis of the role of occupational restructuring provides a novel opportunity to capture the heterogeneity in the effects of outsourcing on employee well-being, particularly in detecting its potential welfare-improving aspects (i.e., the "silver lining").

The contribution of this paper is that it scrutinizes the role of occupational restructuring within firms as a conveying mechanism between firm outsourcing and the well-being of those employees who have managed to retain their jobs in the process (i.e., "stayers"). Firstly, we examine how occupational restructuring is affected by different types of outsourcing; secondly, we investigate how outsourcing is related to different aspects of employee well-being. To accomplish this goal, we draw important distinctions between the following four facets of occupational restructuring within firms: 1) *destruction*, 2) *creation*, 3) *reallocation*

and 4) *work content*. For these aspects, we provide useful indicators that are obtained by applying occupation-based measures of job and worker flows through the use of longitudinal linked employer-employee data.

Using our comprehensive set of indicators for occupational restructuring and linked employer-employee data on firm outsourcing and employee well-being, we obtain the following findings. Firstly, offshoring to low-wage countries is found to involve intensive job destruction and worker separation in the affected firms and it is associated with decreased job satisfaction among staying employees. Secondly, our results show that offshoring to high-wage countries stimulates reallocation within the affected firms in terms of the vertical mobility of employees. Intra-firm mobility increases perceived employee well-being in terms of improving the prospects for promotion. Thirdly, offshoring to low-wage countries is accompanied by increasing the shares of knowledge workers, whose overall job satisfaction is found to improve in such circumstances.

The negative aspects of outsourcing have gained considerable attention in public debate. Concern regarding the destructive side of occupational restructuring is apparent among employees who perform "offshorable" tasks.[4] Accordingly, earlier evidence suggests that offshoring has negative effects on certain aspects of employee well-being, such as perceived job security (Geishecker et al. 2012). Our results are partly consistent with such findings because offshoring is closely and positively associated with job destruction, worker separation and a decrease in overall job satisfaction in the affected firms, especially when the destination is a low-wage country.

Our tools prove to be particularly useful in providing insight into the silver lining of offshoring, which is related to reallocation and changing work content in offshoring firms. However, because our analysis focuses on the well-being of staying employees, a straightforward generalization of our findings at the level of the entire economy cannot be offered. Nevertheless, broader considerations suggest that offshoring may also have positive effects on employee well-being in the entire economy. Offshoring is part of a

restructuring process that involves an increase in the share of high value-added occupations in the home country. Accordingly, we document that offshoring to low-wage countries is associated with an increase in the share of knowledge workers in the affected firms.[5] These changes are part of the productivity-enhancing restructuring that fuels economic growth and consequently improves happiness in developed countries (Sacks et al. 2010; Stevenson and Wolfers 2008). Furthermore, our results reveal that knowledge workers have higher job satisfaction. Of course, a critical factor in the efficiency of restructuring concerns whether mobility from non-knowledge work to knowledge work successfully transpires in the labor market.

In addition to applying indicators of intra-firm occupational restructuring, our linked employer-employee data that innovatively combine survey and register data are useful in the study of different aspects of outsourcing for other reasons. We use a comprehensive set of firm-level measures of outsourcing from a representative survey, whereas much of the earlier literature has depended on industry-level proxies for outsourcing. Our firm-level data have an advantage in that they do not suffer from aggregation bias (Geishecker 2008). However, examining employees who are affected only by within-industry variation in outsourcing refers to a partial equilibrium analysis (i.e., the effects of outsourcing across industries are ignored).[6] Our approach is also valuable because it allows for the examination of the role of destination in outsourcing (e.g., home country, developing and developed countries). In addition, we analyze the effects of insourcing (i.e., the opposite of offshoring), which has received scant attention in the literature. Furthermore, our data cover the service sector. Earlier research has focused on manufacturing, but the share of manufacturing jobs has declined considerably in developed countries, and manufacturing may no longer be a representative part of such economies. Therefore, this extension into the service sector enables us to determine whether the earlier findings are specific to the manufacturing sector.

We analyze the relationships among outsourcing, occupational restructuring and employee well-being in the Finnish context. The pressures of globalization are pronounced in Finland because it is a small, open economy with high levels of wages and benefits. In recent years, considerable changes have occurred in Finland's trade patterns. For example, the share of non-OECD countries in the total Finnish manufacturing

trade increased by ~10 percentage points from 1999 to 2004. Within the manufacturing sector, the electronics industry and the manufacture of telecommunication equipment have rapidly increased their outsourcing in the past ten years. Additionally, the Finnish labor market has been turbulent for decades (Ilmakunnas and Maliranta 2011). On average, more than ten percent of all jobs in the business sector are eliminated annually, and this trend has been stable in recent years. Worker inflow and separation rates have more than doubled. However, despite increasing globalization and turbulent labor markets, life satisfaction has remained at a high level with a stable or increasing trend, according to the Eurobarometer[7] (Lehto and Sutela 2009). But this high level of satisfaction does not indicate that globalization, in its various forms and with its associated labor market effects, has been irrelevant to employee well-being, especially for those who are most vulnerable to its effects.

The paper proceeds as follows. We first describe the conceptual framework and the linked data. We then provide an overview of the empirical specifications. The estimation results are then presented, and a summary concludes the paper.

Conceptual Framework

Dimensions of Outsourcing and its Links to Various Aspects of Employee Well-being. Figure 1 illustrates the conceptual framework of the analysis. The aim is to understand how outsourcing at the firm level affects the well-being of staying employees (i.e., stayers) who have managed to retain their jobs during the outsourcing period. The focus on stayers is particularly interesting in the context of employee well-being for a number of reasons. Firstly, the measures of subjective well-being for stayers have been related to policy-relevant firm-level outcomes, such as absenteeism and productivity (e.g., Green 2006; Böckerman and Ilmakunnas 2012). Secondly, a study of stayers is essential to understand the broader implications of outsourcing on employee well-being because the majority of employees are stayers during our observation window.[8] Thirdly, there is a separate strand of the literature on the effects of organizational restructuring on employee well-being among stayers (e.g., Østhus and Mastekaasa 2010); however, this literature has not examined the effects of

various aspects of outsourcing and has not specifically explored occupational mobility within firms, which is the essential part of our analysis.

Figure 1 around here

We devote special attention to the role of occupational reorganization within firms as a conveying mechanism between outsourcing and employee well-being. We emphasize that each of the three parts of the analysis – outsourcing, occupational restructuring and well-being – has diverse dimensions that warrant close scrutiny. The combined data (which are described in detail in the next section) provide an exceptional opportunity to examine these three closely interlinked parts and their multiple dimensions (Figure 1). Rich data sets on outsourcing and employee well-being and careful measurement of the different aspects of occupational restructuring using a comprehensive set of indicators enable us to disentangle the mechanisms of outsourcing and perceived well-being. In particular, this approach allows us to investigate whether the negative effects of outsourcing (for employees who are made redundant) are accompanied by positive and counterbalancing effects on at least some stayers.

The immediate negative effects of outsourcing on employee well-being are evident. By definition, outsourcing means that certain occupations are eliminated (i.e., moved to other local firms or abroad); thus, the demand for this type of labor in a firm decreases. Arguably, a substantial proportion of the negative effects on well-being originates from the expected losses of firm-specific human capital, quasi-rents, delayed compensation (when a worker expects to earn less in the future) or from job search costs that are incurred.[9]

Various aspects of well-being at work may be negatively affected by outsourcing. Firstly, *job satisfaction* may decrease as a result of losing fellow employees in the context of firm reorganization. Secondly, the decision to outsource could imply further actions of a similar sort; thus, recent outsourcing may increase *uncertainty* regarding the future. Previous evidence has related offshoring and other measures of

globalization to job-loss fears (e.g., Geishecker et al. 2012; Lurweg 2010; Scheve and Slaughter 2004). These effects have also been found in other Nordic countries; in fact, Munch (2011) reports that offshoring increases the unemployment risk of low-skilled workers in the Danish manufacturing sector. These findings are relevant for staying employees because previous outsourcing may increase unemployment risk for many years. Thirdly, a reduction in personnel may entail decreased prospects for *promotion*, a weakened bargaining position and a smaller *voice* in an organization. Fourthly, outsourcing is associated with downsizing in some occupations, with the result that *work intensity* among stayers may be higher. All of these factors suggest that the expected effects on employee well-being are negative.

However, the *geographical destination of outsourcing* plays a pivotal role in shaping the relationship between outsourcing and employee well-being. Offshoring to low-wage developing countries is a typical method of reducing labor costs. Consequently, this activity is expected to be accompanied by job destruction and worker separation. Those employees who have managed to retain their jobs may perceive offshoring to developing countries as a sign of weakness in a firm's position in the market and as an indication of need for (or intentions about) future cost reduction in the firm. Furthermore, the quality of jobs is drastically lower in developing countries than in Finland, which constitutes a potential threat to domestic labor standards. In sum, offshoring to low-wage countries should have a significant negative effect on the job satisfaction of staying employees. Not surprisingly, Geishecker et al. (2012) find that offshoring to developing countries has a negative effect on the perceived level of job security among German employees. However, when the destination of offshoring is a low-wage country, job destruction should be focused on offshorable occupations rather than knowledge-intensive occupations (cf. Blinder 2006).

The implications for occupational restructuring and employee well-being are qualitatively different when the destination of outsourcing is a high-wage country rather than a low-wage country. In both cases, the vertical fragmentation of production may involve increased intra-firm mobility between occupations, but the vertical mobility of employees with positive prospects for promotion is more prominent when the destination is a high-wage country. For the same reason, it is important to make a clear distinction between domestic

outsourcing (in a high-wage country such as Finland) and offshoring. Offshoring to a high-wage country may create career advancement opportunities for employees because it effectively broadens the market for talent. Offshoring among high-wage countries is also likely to be reciprocal, and workers in high-wage countries are complements rather than substitutes (cf. Geishecker et al. 2012). Research by Geishecker et al. (2012) supports this notion by reporting that offshoring to developed countries significantly improves the perceived job security. However, the exact mechanisms behind this effect are unknown.

An issue that is closely related to geographical destination is the underlying *motivation for outsourcing*, which may also have implications on subsequent well-being effects. Outsourcing should have more negative effects on employee well-being if it is motivated by the reduction of labor costs rather than by opening new markets for a firm's products and services, which should benefit both the firm and its workforce in the long term.[10]

The effects of outsourcing may also vary significantly between different types of staying employees because such an adjustment does not affect all employees equally. Some employees may benefit from the process, whereas others may incur losses. For example, knowledge workers may benefit disproportionately from outsourcing because it creates opportunities for them to utilize their skill sets and increases their relative importance in an organization. As a result, job satisfaction among staying knowledge workers may increase when their employment share increases. This potential *heterogeneity of effects* between different worker groups may partly obscure the general relationship between outsourcing and perceived well-being.

The bottom line is that the relationship between outsourcing and employee well-being is more ambiguous when different aspects of well-being, the variability of outsourcing, and the heterogeneity of employees are fully considered. For this reason, there is an apparent need to estimate the specifications that allow for varying relationships among different worker groups with a comprehensive set of indicators for outsourcing, occupational restructuring and well-being. A multifaceted analysis also assists us in elaborating on the explanations. For example, it is equally important to examine and assess the role of increased uncertainty

(because of the threat of job destruction), opportunities for promotions (because of the vertical mobility of employees in firms) and changed work content (because of occupational restructuring), as elements of overall work satisfaction when offshoring increase the vertical fragmentation of production.

Measurement of Occupational Restructuring. A job is defined as the match of a worker to an occupation in a firm. Therefore, a firm is a collection of different jobs with different occupations. Consequently, occupational restructuring is an outcome of job creation and destruction at the level of occupations within firms. We gauge various aspects of intra-firm occupational restructuring by applying the standard measures of both job and worker flows at the level of firms rather than at the level of a sector or an industry, as is typical in the literature (Burgess et al. 2000; Davis and Haltiwanger 1999). This approach allows us to analyze different adjustment margins. To measure job creation and destruction, we identify the number of workers in different occupations in each firm using the ISCO-88 classification of occupations at the 1-digit level.[11] The following occupational groups are included:

1. Managers
2. Professionals
3. Technicians and associate professionals
4. Clerks
5. Service and care workers and shop and market sales workers
6. Craft and related trade workers
7. Plant and machine operators and assemblers
8. Elementary occupations

Job creation (*JC*) in firm *i* is the sum of positive employment changes in the occupations (*j*=1, …, 8) between year *t* and *t*-1, $JC_{it} = \sum_{j=1}^{j=8} \Delta L_{ijt}^{+}$, where Δ denotes the difference operator and the superscript "+" indicates that $L_{ijt} > L_{ij,t-1}$. Job destruction (*JD*) is defined analogously: $JD_{it} = \sum_{j=1}^{j=8} \left| \Delta L_{ijt}^{-} \right|$, where the superscript "-" indicates that $L_{ijt} < L_{ij,t-1}$. The net employment change in firm *i* is $NET_{it} = \sum_{j=1}^{j=8} L_{ijt} - \sum_{j=1}^{j=8} L_{ij,t-1}$. Therefore, a firm may experience simultaneous job creation and destruction. A suitable indicator of such actions is excess job reallocation (*EJR*): $EJR_{it} = JC_{it} + JD_{it} - NET_{it}$. *EJR* is a measure of heterogeneity in the employment changes in firms. If *EJR* is above zero, then the magnitude of

gross job flow (i.e., job creation and destruction) in firms is above what is necessary to accommodate the net employment changes in such firms.

The measures of worker flows provide a useful extension of the analysis of occupational restructuring, holding that $NET_{it} = JC_{it} - JD_{it} = H_{it} - S_{it}$, where *H* (hired) denotes the number of employees who were hired for their current occupations in year *t*, and *S* (separated) records the number of employees who left their occupations in year *t*. Hired employees consist of two groups, internally hired (*IH*) employees, who worked for the same firm (but in a different occupation) in year *t*-1, and externally hired (*EH*) employees, who did not work for the same firm in year *t*-1. Analogously, the separations can be divided into internal separations (*IS*) and external separations (*ES*). Thus, it holds that $NET_{it} = JC_{it} - JD_{it} = H_{it} - S_{it} = IH_{it} + EH_{it} - IS_{it} - ES_{it}$. By definition, $IH_{it} = IS_{it}$.

Following the literature on job and worker flows, we convert all flow measures into rates by dividing them by the average employment of each firm in year *t* and *t*-1 (*AL*); $AL_{it} = \left(\sum_{j=1}^{j=8} L_{ijt} + \sum_{j=1}^{j=8} L_{ij,t-1} \Big/ 2\right) = \left(L_{it} + L_{i,t-1}\right) \Big/ 2$.[12] In the empirical analysis, we do not use annual changes (i.e., changes between *t*-1 and *t*); rather, we use a six-year window (i.e., changes between 2000 and 2006). This choice is dictated by the structure and content of the data. Longer differences are also useful for capturing time-consuming mechanisms, such as those examined in this study, especially when the data contain short-term "noise" (Griliches and Hausman 1986).

In addition to measuring job and worker flow rates, we apply indicators that capture the shares of interactive and non-routine occupations in the firms. We use German survey data on the prevalence of non-routine and interactive tasks in occupations to measure the nature of the task content of the 2-digit level occupations because Germany is the only European country for which such information is available.[13] The use of these German data is possible because the German work survey codified by Becker et al. (2013) can be converted into the ISCO-88 classification of the occupations at the 2-digit level that we have in the Finnish register

data on individuals. This approach is identical to that employed by Nilsson Hakkala et al. (2009) in their analysis of the offshoring activities of Swedish firms. Non-routine tasks involve non-repetitive work methods and creative problem solving; such tasks cannot be programmed as simple rules. Interactive tasks require personal interaction with co-workers or third parties. This categorization of different occupations in terms of their actual content is related to outsourcing because routine and non-interactive tasks are most easily offshored (Baldwin 2006; Becker et al. 2013). By measuring the changes in the shares of non-routine and interactive occupations between 2000 and 2006, we can explore interesting characteristics of occupational restructuring at a more detailed level.

A more straightforward measure of occupational restructuring consists of the change in the share of knowledge workers between two points in time. "Knowledge workers" constitute a broad category, including the first four occupational groups (i.e., managers, professionals, technicians and associate professionals, and clerks), because technicians, associate professionals and clerks work closely with professionals in most workplaces.[14]

Therefore, in the empirical specifications, we examine the following four broad aspects of occupational restructuring: 1) *destruction* (job destruction and worker separation), 2) *creation* (job creation and worker hiring), 3) *reallocation* (excess job reallocation and intra-firm mobility captured by internal worker separation, which corresponds to internal worker hiring), and 4) *work content* (the changes in the shares of interactive occupations, non-routine occupations and knowledge workers).

Data

The analysis is based on rich, linked data that combine the three data sources (see the bottom panels of Figure 1). Each source has substantial merits.

International Sourcing Survey. To measure the outsourcing activities of firms, we use a firm-level survey, the International Sourcing Survey (ISS) of Statistics Finland (SF), which was conducted in 2009 (see Statistics Denmark et al. 2008). The questions in this survey refer to domestic outsourcing and offshoring from 2001 to 2006 and cover the non-financial business sector (NACE, sections C to I and K). The focus of the ISS was on large enterprises because multinational enterprises are considered key players in offshoring. A random sample of smaller firms (50-99 employees) was also analyzed, but the coverage of the survey on larger firms (at least 100 employees) is much more complete. The response rate of the survey was 80%, and the final data cover 1,400 firms. Approximately 300 of these firms have a workforce of 50-99 employees, whereas the other firms in the survey have at least 100 employees. Because of the framework of the questionnaire, the data cover a substantial proportion of the total employment in the Finnish business sector. For example, in the manufacturing sector, the ISS coverage is 60%. In the service sector, the coverage is 46% of the firms that employ at least 5 persons (Maliranta 2013).

Offshoring is defined in the ISS as the total or partial movement of business functions (core or support functions) that are currently performed in-house or domestically outsourced by the resident enterprise to either non-affiliated (external suppliers) or affiliated enterprises located abroad (Statistics Denmark et al. 2008, p. 13). Therefore, offshoring covers both in-house and out-of-house offshoring. All outsourcing indicators measure the outsourcing of a firm's core business functions because the outsourcing of these functions is likely to have an effect on the well-being of staying employees.[15] The ISS also includes information regarding domestic outsourcing, the geographical destinations of offshoring, and the insourcing (i.e., the opposite of offshoring) of core business functions. The indicators of outsourcing are binary. The indicators take the value of one if outsourcing has increased or firms have started to outsource. One important advantage of the use of the ISS is that it also contains information regarding the outsourcing motivations of firms. The use of this information is crucial to capture the potential silver lining of outsourcing, which is the central aspect of our analysis and has been neglected in the literature until now. By contrast, information on the value of imported intermediate inputs offers no tractable information regarding these important motivational aspects of outsourcing.

Finnish Linked Employer-Employee Data. The second configuration of data that we use in our analysis is the Finnish Longitudinal Employer-Employee Data (FLEED). These data are constructed from a number of different registers of individuals and firms that are maintained by SF and contain information from Employment Statistics, which records each employee's employer during the last week of each year. FLEED covers nearly all firms in Finland. FLEED data are used primarily to measure occupational restructuring in firms using the measures of job and worker flows at the firm-occupation level proposed by Maliranta (2009, 2013). The measures of occupational restructuring are based on the ISCO-88 classification at the 1-digit level (Maliranta 2009, 2013), as described previously.[16] One important advantage of these measures is that, by design, they are able to account for the intensity of restructuring, which cannot be captured using the binary indicators of the ISS.

Quality of Work Life Survey. The third set of data that we use is the latest edition (2008) of the Quality of Work Life Survey (QWLS) of SF that measures employee well-being (Lehto and Sutela 2009). The QWLS provides a representative sample of Finnish wage and salary earners (self-employed individuals are excluded). The initial sample for this survey is derived from a monthly labor force survey (LFS) by SF, for which a random sample of the working-age population is selected for telephone interviews. The representative sample of employees in the QWLS provides a significant advantage over previous studies that focused on a few manufacturing industries or single firms. The estimates for certain sectors and firms could be subject to selection bias if the unobserved factors that determine whether employees choose to work in a particular sector or firm also influence their perceived well-being. In this regard, we maintain that the coverage of QWLS is outstanding.

The 2008 QWLS was based on LFS respondents in March and April who were 15-64 years old and had a normal weekly working time of at least ten hours. In total, 6,499 individuals were selected for the QWLS sample and invited to participate in personal face-to-face interviews. Of this sample, 4,392 persons participated (approximately 68%), which is a high response rate for a complex and burdensome face-to-face survey (Lehto and Sutela 2009). The average length of the interviews was 66 minutes. Face-to-face

interviews ensure reliable answers to almost all questions. Because of missing information on some variables for some employees, the final sample size of the QWLS included approximately 4,300 observations (~30% of these observations cover the public sector, which is not included in our analysis). The QWLS is supplemented with information from the LFS and several registers maintained by SF. For example, information regarding the educational level of employees originates from the Register of Completed Education and Degrees.

We use variables to capture both general well-being at work and more specific aspects of employee well-being. All aspects of self-reported well-being are measured with dummy variables. *Job satisfaction* is particularly important because it constitutes a general measure of perceived well-being at work (Clark 1996), and job satisfaction is a strong predictor of various employee outcomes, such as absenteeism and employee turnover (e.g., Böckerman and Ilmakunnas 2009). Job satisfaction is originally measured on a four-point Likert scale in the QWLS. Because the observations on job satisfaction are bunched at the higher end of the scale, we used an indicator for those who were "very satisfied" with their work. (The average for this indicator is ~20%.) In addition to job satisfaction, we captured perceived *uncertainty* because previous studies have related outsourcing to this particular aspect of employee well-being (e.g., Geishecker et al. 2012). For perceived uncertainty, the respondents stated whether certain aspects were insecurity factors, including the threat of temporary dismissal and the threat of unemployment (Böckerman and Ilmakunnas 2009). We used a dummy variable for at least one insecurity factor.[17] This formulation is not particularly sensitive to potential measurement error in a self-reported measure. Furthermore, we used the indicator for *promotion prospects* because it is closely related to the occupational restructuring that constitutes the main focus of our paper. Lastly, we used the indicators for perceived *voice* and *work intensity* because they describe the aspects of employee well-being that are particularly relevant for health and subsequent job performance (e.g., Brown and Leigh 1996). We captured perceived work intensity with a dummy variable by using each respondent's agreement with the following statement: 'Work pressure increases sickness absence'.

Matching. Matching these three primary data sources is possible because all of the data sets contain the same unique firm and person identifiers that are maintained by SF. This information also ensures near-perfect traceability of employers and employees over time. The QWLS and FLEED are matched by the use of unique ID codes for persons. Using FLEED, we can follow employees who participated in the 2008 QWLS over the 1990-2007 period. In each year, we can link firm and establishment information to each person. The combination of the QWLS and FLEED can then be matched to the ISS using the unique firm codes. The variables that are used in the empirical specifications are described in Appendix (Table A1).

Through matching, we obtain three different samples for the estimations. The earlier literature on the effects of outsourcing has not used this type of linked data with its broad set of relevant information. Unfortunately, there is an inevitable trade-off between the sample size and the richness of data content. Thus, linking different data sets reduces the sample sizes, and the sample size that is used in some of the estimations is therefore relatively small.[18] Table 1 reports descriptive statistics regarding the representativeness of the three different samples of the combined data. For the sake of comparison, we report the computations for both firm-level and individual-level data. The firm-level data contain information on firms that collectively employ ~350,000 employees (Table 1, Column 2), which is approximately one-fourth of all Finnish private-sector employees. ~100,000 employees have worked in firms that have been subject to some type of outsourcing. We also find that the mean values for the outsourcing variables are close to one another in the samples that use the firm-level data compared with the individual-level data (cf. Columns 3 and 6 of Table 1). This finding shows that the employee-level data remain representative compared with the employment-weighted firm-level data. Certain other variables, such as the measures of occupational restructuring, exhibit larger discrepancies between the different samples. Nonetheless, these discrepancies are generally not outsized. In summary, the combined data provide a largely representative picture of the economy, and the sample sizes are sufficiently large to support statistically significant relationships.

Table 1 around here

The QWLS is a cross-sectional data set that includes only limited self-reported information on past labor market experience. However, because FLEED can be used to incorporate information on employee work histories from 1990 to 2007, we are able to measure various labor market outcomes in the past. This capability is particularly important in our context because we are unable to estimate specifications with fixed individual effects because the QWLS is not a panel. Using the variables that describe past labor market outcomes, we are able to account for otherwise unobservable determinants of subjective well-being and thus lessen the concern that the omitted variable bias significantly affects our results. (For an application of this approach in another context, see Lechner and Wunsch 2011.) We use past average earnings and the number of employment and unemployment months to describe the relevant work histories of employees.

Figure 2 illustrates the timing difference between the key variables in the combined data. Employee well-being is measured with a considerable lag because the mid-point of the outsourcing period is 2003 (i.e., an average of five years earlier).

Figure 2 around here

Because the QWLS data are from 2008, the final estimation sample includes only those employees who were employed in the same firm from 2006 to 2008. The matched data contain information pertaining to 770 employees. This number reflects the fact that the ISS data are significantly more likely to pertain to large firms. The final estimation sample contains observations for 367 firms; therefore, we have an average of two employees for each firm. This approach is preferred over the use of data on a large number of employees from a limited sample of firms when the goal is to provide a representative picture of the economy. We also estimate separate specifications for knowledge workers, with a sample size of 421. The specifications that use the measures of occupational restructuring are based on a larger data set of 1,174 observations because we do not need to rely on the ISS. Rather, we can use comprehensive register data from FLEED to construct the measures of labor market turbulence. The number of different firms in this sample is 796.

Empirical Specifications

The first step is to establish the immediate association of outsourcing with occupational restructuring by using firm-level regressions (the first and second panels of Figure 1). The specifications take the following form:

$$RESTRUCTURING_{jk} = \beta \boldsymbol{X}_j + \delta OUTSOURCING_j + \varepsilon_j, \quad k = 1,...,9, \tag{1}$$

where $RESTRUCTURING_{jk}$ represents the measure *k* of occupational restructuring for firm *j*. For the dependent variables, we use four different aspects of occupational restructuring (*destruction*, *creation*, *reallocation*, and *work content*), as described earlier. $\boldsymbol{X}_j$ represents the vector of control variables, which include the size of a firm (the logarithm of employment) and the industry effects (with a set of indicators for 22 industries). The variable of interest is the binary measure of outsourcing. The baseline category is that a firm has neither outsourced domestically nor offshored its core business functions from 2001 to 2006.

Because the dependent variables that capture restructuring are measured over the 2000-2006 period, these specifications reveal conditional correlations between the variables. Thus, we do not claim to establish causal effects with the estimates of equation (1). The purpose of these descriptive regressions is to characterize the nature of different types of outsourcing and to validate the measures of outsourcing. The estimates show how different types of outsourcing are related to various aspects of occupational restructuring, which we argue is a conveying mechanism between outsourcing and employee well-being. Descriptive statistics on the firm-level data that are used in these estimations is provided in Columns 1-4 of Table 1.

We use employment-weighted OLS to estimate equation (1) because we are interested in how various forms of firm outsourcing are related to employee outcomes (i.e., mobility and well-being of employees).[19] Thus, we consider our firm-level data as grouped data on individual employees with observed means for individual

employees (Angrist and Pischke 2009, p. 40-41; StataCorp 2011, p. 301). The implication is that large firms with a greater number of employees should have a stronger effect on the estimates than small firms. Therefore, we effectively give equal weight to all employees irrespective of the size of their employers. An additional advantage of placing greater emphasis on larger firms is that their measures of occupational restructuring are more reliable (Ilmakunnas and Maliranta 2005). Therefore, the employment-weighted estimator is more efficient.

The second step is to examine the relationship between outsourcing and perceived well-being among staying employees (the first and third panels of Figure 1). We estimate specifications with the following structure:

$$Y_{ijk} = \beta \boldsymbol{X}_{ij} + \eta OUTSOURCING_j + \varepsilon_{ij}, \quad k = 1,...,8, \tag{2}$$

where Y_{ijk} is the measure *k* of employee well-being for individual *i* employed in firm *j*. The dependent variables are five different measures of employee well-being. $\boldsymbol{X}_{ij}$ represents the control variables, which incorporate the standard individual-level covariates, such as employee age and education level, based on the literature on subjective well-being (Clark 1996). Additionally, we control for occupational groups and employee work histories to capture potentially confounding factors.[20] The standard errors in all specifications of equation (2) are clustered at the firm level. Columns 5-7 of Table 1 provide descriptive statistics for the employee-level data that are used in these estimations.

The goal of these descriptive regressions is to examine how firm outsourcing is related to the well-being of those employees who have stayed in the firms during the outsourcing period (i.e., stayers).[21] The estimates of equation (2) reveal conditional correlations between the variables. For example, employees may be able to anticipate upcoming outsourcing. These anticipation effects have been discussed in the literature on job displacement (e.g., Lengermann and Vilhuber 2002). Our contribution is to offer the first systematic empirical account of the relationship between outsourcing and employee well-being with particular emphasis on the policy-relevant aspects of occupational restructuring.

The third step is to explore the relationship between occupational restructuring and the well-being of staying employees (the second and third panels of Figure 1). For this purpose, we use specifications with the following structure:

$$Y_{ijk} = \beta \boldsymbol{X}_{ij} + \lambda RESTRUCTURING_{jl} + \varepsilon_{ij}, \quad k = 1,...5 \quad l = 1,...9, \tag{3}$$

where Y_{ijk} is the measure *k* of employee well-being for individual *i* employed in firm *j*. The explanatory variables of interest in these descriptive regressions are each separate measure (*l* = 1,…,9) of occupational restructuring (*destruction, creation, reallocation,* and *work content*). The vector of control variables $\boldsymbol{X}_{ij}$ is identical to that in equation (2). The last two columns of Table 1 document descriptive statistics for the data that are used with these specifications.

Results

Outsourcing and Occupational Restructuring. We first examine whether outsourcing is related to occupational restructuring and, if so, the manner in which they are related. The results in Table 2 refer to continuing firms that account for the majority of the restructuring during the six-year window. With this restriction, we avoid the asymmetries that may be caused by entries and exits. Because we include the full set of industry indicators among the control variables, the results point to within-industry relationships.

Table 2 around here

The estimates of equation (1) reported in Table 2 show four main relationships between outsourcing and occupational restructuring. Firstly, offshoring is associated with high rates of job destruction and worker separation, and these relationships are significant both statistically and economically. The point estimates reveal that offshoring firms have job destruction rates that are 19.2 percentage points higher than those firms that have not offshored nor outsourced domestically (Table 2, Panel A, Column 1).[22] This result shows that

job destruction in the offshoring firms is approximately twice as large as in the non-offshoring firms when several confounding factors, such as industry effects, are taken into account.[23] A breakdown by geographical destination is reported in Panel B of Table and reveals that these patterns primarily concern developing countries and less developed European countries (i.e., European countries other than the 15 EU countries). This pattern supports the notion that offshoring to low-wage countries is a method of labor cost reduction.

Secondly, offshoring is accompanied by decreased job creation and worker hiring (Table 2, Columns 3-4). The quantitative magnitude of these relationships is also considerable. The job creation rate of offshoring firms is 21.2 percentage points lower than that of firms that have not offshored nor outsourced domestically. Notably, offshoring to high-wage countries (to the 15 EU countries and other developed countries) and domestic outsourcing do not appear to decrease job creation or worker hiring. Thirdly, as suggested in our conceptual framework, we find evidence that offshoring and domestic outsourcing involve increased intra-firm mobility between occupations (Table 2, Panel A, Column 6). This pattern appears to apply to both developing countries and other developed countries (e.g., the United States and Canada). Therefore, the vertical fragmentation of production is closely related to the vertical mobility of employees in firms that engage in offshoring. However, a similar relationship cannot be found for either the high- or low-wage European countries (i.e., the 15 EU countries or the rest of Europe). Fourthly, offshoring is accompanied by an increase in the share of knowledge work, especially when the destination is a developing country (Panel B, Column 9).[24] In addition to being statistically significant, the relationship is economically important (5.7 percentage points).

In addition to these four main results, there are also other patterns in Table 2. Some of them are in accordance with our conceptual framework. Offshoring to developing countries has a statistically significant positive relationship with excess job reallocation within firms. The coefficient for other developed countries is also positive, but the estimate is imprecise and thus not statistically significant. By contrast, the relationship between offshoring to the rest of Europe and excess job reallocation is negative and statistically significant. Furthermore, we do not find significant relationships between offshoring and the change in work

content (i.e., the shares of interactive or non-routine occupations); although these aspects have been strongly emphasized in the literature (e.g., Autor et al. 2003).

Overall, the evidence clearly reveals that outsourcing has a significant association with occupational restructuring in ways that generally correspond to our expectations that were highlighted in the conceptual framework. These findings suggest that we can anticipate outsourcing to have a negative relationship to employee well-being because outsourcing involves job destruction. However, outsourcing may also have a silver lining, because, in certain circumstances, outsourcing is strongly related to the occupational mobility of employees within firms, which may create opportunities for promotion. Next, we examine whether any traces of this pattern can be found using perceived employee well-being.

Outsourcing and the Well-being of Employees. We now explore how outsourcing affects different dimensions of well-being among staying employees, based on equation (2) (Table 3).[25] Before examining the influences of outsourcing, we first note that the occupational group exhibits a significant, independent association with employee well-being. Table 3 documents the fact that perceived well-being is particularly low among service and sales workers as well as among typical blue-collar occupations. The estimates for the (unreported) other control variables that are included in all specifications of Table 3 are in accordance with previous studies that have used Finnish data sets to estimate well-being equations.

Table 3 around here

Our conceptual framework and the previous analysis of outsourcing and occupational restructuring suggest that the relationships between outsourcing and employee well-being should depend on whether the destination of outsourcing is a low- or high-wage country. The results in Table 3 are partly consistent with this notion. The relationship between offshoring and job satisfaction is negative (and statistically significant) when the destination is a developing country (Table 3, Panel B, Column 1). The quantitative magnitude of this relationship is substantial, because offshoring to a developing country decreases the probability of

reporting “very satisfied” at work by ~9%. In contrast, the relationship between job satisfaction and offshoring is not statistically significant at a conventional level of significance for other destinations.

Contrary to our expectations, offshoring to a developing country is not clearly associated with greater uncertainty (the coefficient is positive, but the estimate is imprecise and therefore statistically insignificant). One possible explanation for this result is that some of the negative influences of offshoring have disappeared because of the considerable time lag (an average of approximately five years) between the measurement of outsourcing and employee well-being (cf. Figure 2).

Offshoring to developed countries does not appear to exhibit a statistically significant positive relationship with job satisfaction, as may be expected (Table 3, Panel B, Column 1). However, our results reveal that a significant positive relationship prevails between offshoring and better promotion prospects when the destination is a developed country, such as the United States or Canada (i.e., the coefficient is negative and significant in Column 3 of Panel B). The quantitative magnitude of this relationship is substantial because offshoring to other developed countries decreases the probability of employee perceptions of poor promotion prospects by ~24%. When this result is combined with our earlier finding that this type of offshoring is accompanied by the increased intra-firm mobility of employees, we can infer that under these circumstances, occupational restructuring that is driven by offshoring improves promotion and subsequent wage prospects, at least for some stayers. This finding is intuitive because Finland is a small, open economy with limited opportunities, especially for highly skilled workers. For this reason, offshoring, in addition to other aspects of globalization, creates opportunities for career advancement by effectively broadening the market for talent.[26]

In addition to improved promotion prospects, there are indications of another positive influence of offshoring on employee well-being. The results show that offshoring to developing countries decreases the probability of reporting that ‘work pressure increases sickness absence’ by ~8% among staying employees (Table 3, Panel B, Column 5). By contrast, offshoring to the rest of Europe increases work intensity by 15%.

However, the interpretation of these findings is not straightforward because neither our conceptual framework nor our previous findings pertaining to the patterns of occupational restructuring offer guidance. For example, offshoring to a developing country may reduce work intensity because the most intensive and tedious tasks are offshored, and the remaining tasks of staying employees are therefore less intensive. But it is unclear why offshoring to the rest of Europe has the opposite effect.

In our conceptual framework, we considered the possibility that the relationship between outsourcing and well-being may differ by employee groups. For this reason, we have estimated separate specifications for knowledge workers (Appendix A4). We mention the main findings only briefly. The outsourcing measures and job satisfaction are unrelated (Appendix A4, Panel B, Column 1). Also, offshoring to developed countries significantly increases the perception of uncertainty (Panel B, Column 2). Most importantly, our earlier finding that offshoring to other developed countries considerably improves promotion prospects among stayers prevails for knowledge workers (Panel B, Column 3). The quantitative magnitude of this estimate is somewhat lower (~18%) than that estimated for all employees.

Occupational Restructuring and Employee Well-being. To complete the analysis, we examine how occupational restructuring among the continuing firms between 2000 and 2006 is related to the well-being of staying employees at least two years later, in 2008. We use exactly the same measures of perceived well-being as the dependent variables, as in Table 3. The results, based on equation (3), are reported in Table 4. Observation is a staying employee. Each row in Table 4 refers to a model whose explanatory variables include one of the nine alternative measures of intra-firm occupational restructuring, in addition to the set of control variables (e.g., the occupational group of the employees). These models are estimated separately for all staying employees (Panel A) and for staying knowledge employees (Panel B) because our conceptual framework suggests that the relationships may differ by employee groups. Thus, Table 4 presents 90 regression results (i.e., nine alternative measures of occupational restructuring and five alternative measures of employee well-being for the two samples).

Table 4 around here

These results reveal two main patterns. Firstly, the destruction, creation and reallocation aspects of occupational restructuring are generally unrelated to subsequent employee well-being. This pattern is consistent with the results of Böckerman et al. (2011), who have reported that turbulence at the establishment level does not cause significant losses in work satisfaction in the Finnish context.

Secondly, the changes in work content (measured by the shares of interactive or non-routine occupations or the share of knowledge workers) in the firms are closely associated with feelings of uncertainty and lack of voice (Table 4, Columns 2 and 4). Increases in the shares of interactive or non-routine occupations, or of knowledge workers generally, reduce perceptions of uncertainty and lack of voice at work. These patterns prevail among all staying employees (Panel A) and staying knowledge workers (Panel B). The independent effect of an employee's own occupational group is controlled for in all models. Thus, for example, when the share of knowledge workers in a firm increases, the perception of the ability to influence one's own work also improves among knowledge workers. The quantitative magnitude of the relationship is considerable, because one-standard deviation change in the share of knowledge workers decreases the probability of having no voice by ~7%. This result is particularly interesting because we previously found (Table 2, Panel B, Column 9) that an increase in the share of knowledge workers is closely associated with offshoring to developing countries. Combining these findings, our evidence suggests that the firms that are engaged in this type of offshoring both provide promising prospects for staying knowledge workers and increase their voice at work.

Additional Aspects. To provide more insight into the relationships observed, we estimated a set of additional specifications. We briefly discuss these results without presenting the findings in tables.

One of the strengths of the ISS for outsourcing activities is that it contains information regarding firms' self-declared motivations for engaging in offshoring. There is evidence that the relationship between outsourcing

and employee well-being differ significantly according to the motivation for offshoring. Specifically, the important result in Table 3 (Panel B, Column 3), which reveals that offshoring to other developed countries significantly improves the perceptions of promotion prospects for staying employees, prevails only when offshoring has been motivated by opening new markets for a firm's products and services, as opposed to efforts to reduce labor costs. This finding is logical because this type of offshoring constitutes substantial opportunities for career advancement, especially for knowledge workers.

There has been an insourcing boom recently. A bunch of prominent high-tech companies such as Apple have moved or are planning to move even some of their assembly work back to the USA (Fishman 2012). We find that insourcing (i.e., the opposite of offshoring) significantly decreases some aspects of adverse working conditions.[27] This observation is reasonable because the cost structure is higher in Finland than in several other countries that were previous locations for these activities. The types of jobs that are insourced to Finland are high-quality jobs with high wages and amenities that support the perception of good working conditions among the affected employees. There is also evidence that insourcing supports overall satisfaction at work.

As a robustness check, we have performed the estimations of Table 2 using unweighted regressions with and without a size restriction for firms (i.e., the inclusion of firms employing fewer than 100 employees). The baseline results in Table 2 remain largely intact in unweighted regressions and in those without a size restriction; however, some important differences are found. In these results, offshoring does not have a statistically significant negative relationship with job creation and worker hiring. Also, offshoring does not have a statistically significant positive relationship with a change in the share of knowledge workers. In addition, the results in Table 2 (Panel B, Column 1) that show that offshoring to developing countries is associated with job destruction and worker separation do not prevail in the unweighted regressions.

Conclusions

The vertical fragmentation of production, which is driven by both domestic outsourcing and offshoring abroad, has potentially profound effects on occupational restructuring in firms. The sizeable short-term adjustment costs to employees may reduce their well-being and explain their persistent resistance to outsourcing. However, occupational restructuring may also serve as a mechanism that increases the vertical mobility of employees within firms by creating promotion prospects for some individuals. For this reason, outsourcing may have welfare-improving aspects (i.e., a "silver lining"). This notion motivated our in-depth empirical analysis of the relationship between outsourcing and employee well-being, in which we devoted special attention to the role of occupational restructuring as a conveying mechanism.

To paint a nuanced and data-driven picture of different aspects of outsourcing we used comprehensive linked employer-employee data. It combined a firm-level survey of outsourcing with rich data content, a survey of employees that contains detailed information on several aspects of perceived well-being, and register data on employees and their employers over a long period of time. These data enabled us to construct a comprehensive set of indicators to measure the four main facets of occupational restructuring: *destruction*, *creation*, *reallocation* and *work content*. Our empirical analysis and its novel set of measures for occupational restructuring provide avenues for further theoretical development in the literature. Therefore, additional research is clearly necessary to construct a single theoretical framework that fully encompasses the main features captured by our empirical analysis.

Our results reveal that offshoring involves job destruction and worker separation especially when the destination is a low-wage developing country. In such circumstances, the job satisfaction of staying employees is found to decrease. This result is consistent with the notion that offshoring to low-wage countries substitutes for domestic employment (Harrison and McMillan 2011). Despite these negative influences, offshoring may also have positive consequences on the well-being of staying employees that have been overlooked in the literature. Accordingly, we find that the relationship between outsourcing and

employee well-being is not entirely negative. Firstly, our evidence shows that offshoring to high-wage countries stimulates the vertical mobility of employees in the affected firms and thus improves perceived employee well-being in terms of better prospects for promotion. This relationship is found to be particularly pronounced when offshoring has been motivated by opening new markets for the products and services of firms rather than by reducing labor costs. The finding that promotion prospects are particularly sensitive to offshoring (to a high-wage country or to open new markets) is reasonable because other aspects of working conditions are closely related to the fixed stock of capital that constitutes the physical work environment, which does not change rapidly in firms. The second important aspect of the silver lining is that offshoring to low-wage countries is typically accompanied by increasing the shares of knowledge workers, who have much better overall job satisfaction. Notably, we find evidence that the well-being of an individual knowledge worker improves (i.e., the worker has a greater voice at work) when the share of knowledge workers (i.e., "colleagues") increases in an organization.

Because we focus on the perceived well-being of staying employees, a straightforward generalization of our results to the level of the entire economy involves a potential fallacy of composition. The estimated positive well-being influences on staying employees do not provide a complete picture of the full effects of offshoring on well-being because those who become unemployed are excluded. Therefore, a broader and more balanced picture would require analyses of what happens to those individuals who lose their jobs because of offshoring. What is the quality of the jobs for which they are hired after the offshoring? The evidence for Finland is partly reassuring. Generally, a large proportion of those who have lost their jobs find new positions reasonably soon (e.g., Kyyrä 2010). However, workers who have lost their jobs in the context of mass layoffs or plant closures may suffer prolonged earnings losses, although these losses tend to be reasonably small when displacement occurs during an economic upswing (Korkeamäki and Kyyrä 2008). This point is important because our analysis covers the period of strong economic growth in Finland. Furthermore, Ilmakunnas and Maliranta (2004) show that old and low-productivity plants have high separation rates to unemployment, whereas new and high-productivity plants have high hiring rates from unemployment during the years of an economic recovery. In sum, unemployment flows constitute a part of

the “creative destruction” process that has made a significant contribution to aggregate productivity growth, at least in Finnish manufacturing (Maliranta et al. 2010). Therefore, although offshoring firms appear to contribute to job destruction, this activity may be part of a broader renewal process in the economy that renders jobs both more satisfying and more productive. In terms of social policy, the primary challenge is to both strengthen the positive effects of restructuring that are triggered by offshoring and to facilitate adjustment to the negative effects of such offshoring, which include greater turbulence and polarization in the labor market.

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FIGURE 1. DIMENSIONS AND LINKS AMONG OUTSOURCING, OCCUPATIONAL RESTRUCTURING AND EMPLOYEE WELL-BEING.

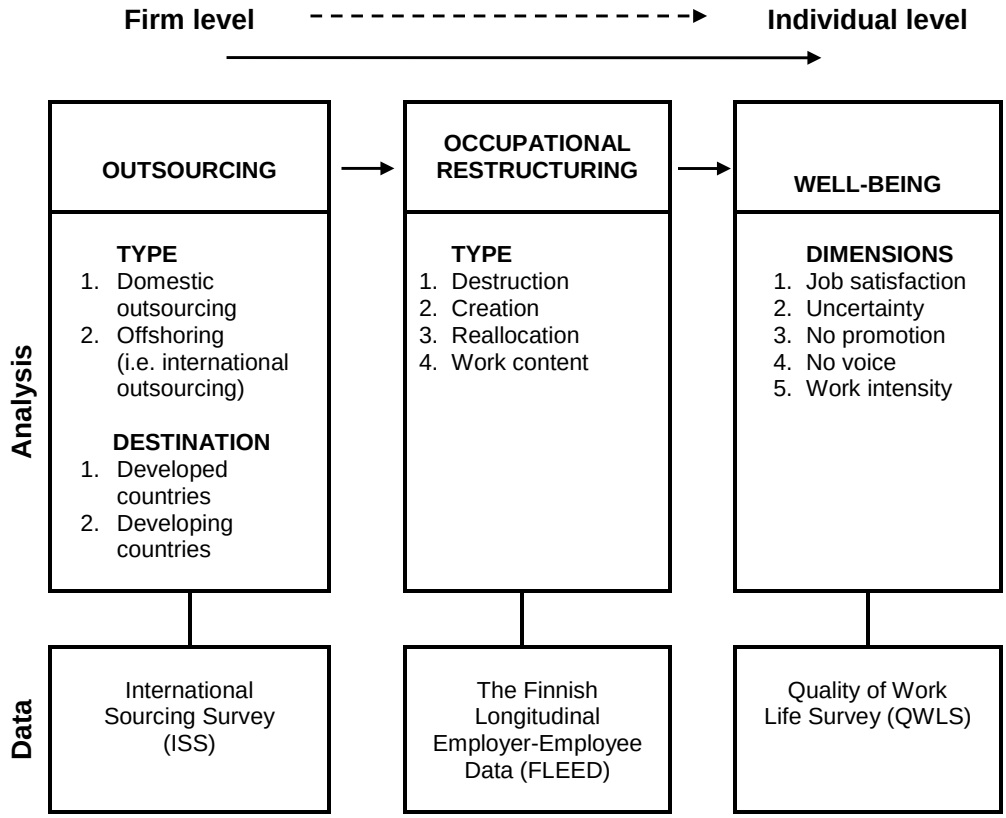

FIGURE 2. TIMING DIFFERENCES IN THE MEASUREMENT OF THE VARIABLES.

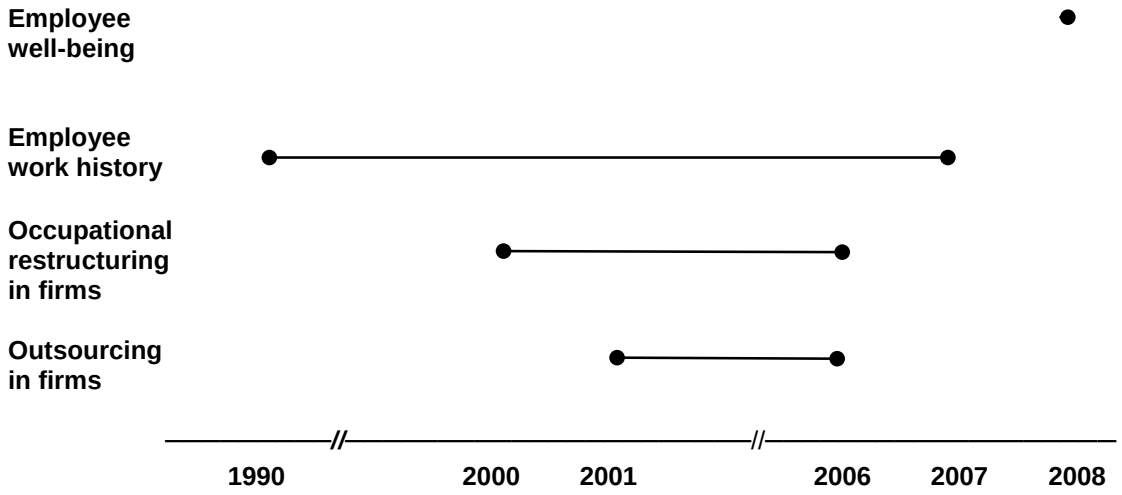

TABLE 1. SELECTED DESCRIPTIVE STATISTICS

	Firm-level data on outsourcing and restructuring				*Individual-level data on outsourcing and well-being*			*Individual-level data on restructuring and well-being*		
	N	Weighted N	Mean	Std.	N	Mean	Std.	N	Mean	Std.
Outsourcing variables										
Domestic outsourcing	1096	353698	0.222	0.416	770	0.209	0.407			
Offshoring	1096	353698	0.147	0.355	770	0.138	0.345			
Offshoring to the 15 EU countries	1096	353698	0.222	0.416	770	0.209	0.407			
Offshoring to the rest of Europe	1096	353698	0.052	0.221	770	0.044	0.206			
Offshoring to developing countries	1096	353698	0.083	0.276	770	0.081	0.272			
Offshoring to other developed countries	1096	353698	0.063	0.243	770	0.057	0.232			
Occupational restructuring variables										
Job destruction	1096	353698	0.204	0.287				1174	0.189	0.234
Worker separation	1096	353698	0.562	0.283				1174	0.506	0.259
Job creation	1096	353698	0.387	0.490				1174	0.472	0.495
Worker hiring	1096	353698	0.744	0.429				1174	0.789	0.436
Excess job reallocation	1096	353698	0.170	0.205				1174	0.212	0.266
Intra-firm mobility	1096	353698	0.167	0.106				1174	0.152	0.121
Change in share of interactive tasks	1096	353698	0.007	0.050				1171	0.008	0.058
Change in share of non-routine tasks	1096	353698	0.014	0.073				1171	0.012	0.084
Change in share of knowledge workers	1096	353698	0.022	0.132				1174	0.009	0.152
Employee well-being variables										
Job satisfaction					770	0.212	0.409	1174	0.227	0.419
Uncertainty					770	0.723	0.448	1174	0.664	0.473
No promotion					770	0.418	0.494	1174	0.486	0.500
No voice					770	0.705	0.456	1174	0.677	0.468
Work intensity					770	0.169	0.375	1165	0.121	0.326
Occupational share variables										
Technicians and associate professionals					770	0.216	0.411	1174	0.195	0.396
Clerical support workers					770	0.110	0.314	1174	0.092	0.289
Service and sale workers					770	0.078	0.268	1174	0.102	0.303
Craft and related trade workers					770	0.129	0.335	1174	0.164	0.370
Plant and machinery operators					770	0.169	0.375	1174	0.172	0.378
Other workers					770	0.078	0.268	1174	0.067	0.251

Note: The exact definitions of the variables are given in Appendix A1.

TABLE 2. THE RELATIONSHIP BETWEEN OUTSOURCING AND OCCUPATIONAL RESTRUCTURING AT THE FIRM LEVEL

PANEL A	Destruction		Creation		Reallocation		Work content		
	Jobs	Workers	Jobs	Workers	Excess job reallocation	Intra-firm mobility	Interactive	Non-routine	Knowledge work
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Domestic outsourcing	-0.0499	-0.0223	-0.0129	0.0147	0.0447	0.0344**	-0.0175**	-0.0155	0.00171
	(0.0436)	(0.0391)	(0.0574)	(0.0501)	(0.0307)	(0.0156)	(0.00745)	(0.0105)	(0.0169)
Offshoring	0.192***	0.216***	-0.212**	-0.187**	0.00741	0.0267	0.0132	0.0217	0.0443**
	(0.0729)	(0.0646)	(0.0881)	(0.0768)	(0.0407)	(0.0210)	(0.0123)	(0.0187)	(0.0210)
PANEL B	Destruction		Creation		Reallocation		Work content		
	Jobs	Workers	Jobs	Workers	Excess job reallocation	Intra-firm mobility	Interactive	Non-routine	Knowledge work
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Domestic outsourcing	-0.0361	-0.00777	-0.0312	-0.00283	0.0276	0.0297*	-0.0171**	-0.0147	0.00666
	(0.0395)	(0.0360)	(0.0581)	(0.0496)	(0.0343)	(0.0161)	(0.00700)	(0.00996)	(0.0161)
Offshoring to …									
The 15 EU countries	-0.0938	-0.0588	0.0197	0.0547	0.0868	0.0131	0.00595	0.00453	-0.00408
	(0.0652)	(0.0603)	(0.0817)	(0.0695)	(0.0610)	(0.0265)	(0.00988)	(0.0165)	(0.0254)
The rest of Europe	0.241***	0.200**	-0.111	-0.151*	-0.0701***	-0.0235	0.0142	0.0219	0.0327
	(0.0879)	(0.0776)	(0.0938)	(0.0802)	(0.0265)	(0.0226)	(0.0167)	(0.0259)	(0.0298)
Developing countries	0.171*	0.207**	-0.206	-0.170	0.0919**	0.0682***	0.00334	0.00587	0.0574**
	(0.0976)	(0.0861)	(0.126)	(0.107)	(0.0439)	(0.0246)	(0.0202)	(0.0275)	(0.0230)
Other developed countries	0.0235	0.0504	-0.0270	0.0000	0.187	0.117**	0.00388	0.0166	-0.0547
	(0.144)	(0.131)	(0.230)	(0.200)	(0.167)	(0.0544)	(0.0181)	(0.0313)	(0.0362)

Notes: The sample size is 1,096 in all specifications. The measures for occupational restructuring are for the 2000-2006 period, and the outsourcing measures are for the 2001-2006 period. Destruction is measured by job destruction ("jobs" in the table) and worker separation ("workers"). Creation is captured by job creation ("jobs") and worker hiring ("workers"). Excess job reallocation measures simultaneous job creation and destruction at the firm-occupation level. Intra-firm mobility is measured by internal worker separation, which corresponds to internal worker hiring. Work content is measured by the changes in the shares of interactive tasks, non-routine tasks and knowledge workers in firms. The baseline category in all specifications is that a firm has neither outsourced domestically nor offshored its core business functions during the 2001-2006 period. The firm-level models are estimated with employment-weighted OLS, as explained in the text. The unreported controls include the logarithm of employment in the firms and a set of indicators for 22 industries. Robust standard errors are in parentheses: *** $p<0.01$, ** $p<0.05$, and * $p<0.1$.

TABLE 3. THE RELATIONSHIP BETWEEN OUTSOURCING AND PERCEIVED WELL-BEING FOR ALL EMPLOYEES

Panel A	Job satisfaction	Uncertainty	No promotion	No voice	Work intensity
	(1)	(2)	(3)	(4)	(5)
Domestic outsourcing	0.00469	-0.000430	-0.0144	-0.0268	0.0195
	(0.0384)	(0.0459)	(0.0512)	(0.0433)	(0.0332)
Offshoring	-0.0389	-0.0222	0.0126	0.0196	0.0136
	(0.0395)	(0.0534)	(0.0611)	(0.0471)	(0.0393)
Technicians etc.	0.00309	0.00892	0.0123	0.211***	0.189***
	(0.0489)	(0.0496)	(0.0584)	(0.0333)	(0.0552)
Clerical support workers	-0.0235	-0.0607	0.0464	0.272***	0.143*
	(0.0583)	(0.0767)	(0.0826)	(0.0247)	(0.0769)
Service and sale workers	-0.202***	-0.122	0.145	0.227***	0.187*
	(0.0654)	(0.108)	(0.105)	(0.0341)	(0.0964)
Craft and related trade workers	-0.162***	-0.0156	0.218**	0.259***	0.0700
	(0.0591)	(0.0699)	(0.0849)	(0.0300)	(0.0768)
Plant and machinery operators	-0.120**	0.0197	0.199***	0.321***	0.161**
	(0.0574)	(0.0634)	(0.0764)	(0.0263)	(0.0776)
Other workers	-0.0958	0.0453	0.297***	0.224***	0.253***
	(0.0705)	(0.0719)	(0.0882)	(0.0324)	(0.0943)

Panel B	Job satisfaction	Uncertainty	No promotion	No voice	Work intensity
	(1)	(2)	(3)	(4)	(5)
Domestic outsourcing	0.00873	-0.00658	0.00752	-0.00908	0.0258
	(0.0390)	(0.0464)	(0.0523)	(0.0438)	(0.0342)
Offshoring to …					
The 15 EU countries	-0.00449	0.0191	0.00759	-0.0145	-0.0359
	(0.0625)	(0.0865)	(0.100)	(0.0862)	(0.0493)
The rest of Europe	0.0276	-0.154*	0.0852	0.0738	0.150**
	(0.0549)	(0.0817)	(0.0990)	(0.0574)	(0.0640)
Developing countries	-0.0931*	0.0672	-0.105	-0.114	-0.0844**
	(0.0508)	(0.0747)	(0.0762)	(0.101)	(0.0346)
Other developed countries	-0.000710	0.0881	-0.236**	-0.0899	-0.0159
	(0.0828)	(0.0908)	(0.107)	(0.137)	(0.0860)
Technicians etc.	0.00254	0.00879	0.0117	0.210***	0.187***
	(0.0489)	(0.0495)	(0.0588)	(0.0335)	(0.0549)
Clerical support workers	-0.0273	-0.0575	0.0389	0.269***	0.132*
	(0.0578)	(0.0770)	(0.0827)	(0.0250)	(0.0748)
Service and sale workers	-0.203***	-0.123	0.143	0.226***	0.184**
	(0.0647)	(0.107)	(0.106)	(0.0342)	(0.0902)
Craft and related trade workers	-0.161***	-0.0111	0.213**	0.257***	0.0656
	(0.0595)	(0.0699)	(0.0853)	(0.0303)	(0.0756)
Plant and machinery operators	-0.120**	0.0215	0.198***	0.322***	0.155**

	(0.0576)	(0.0629)	(0.0769)	(0.0261)	(0.0768)
Other workers	-0.0966	0.0425	0.293***	0.222***	0.250***
	(0.0707)	(0.0724)	(0.0891)	(0.0327)	(0.0932)

Notes: The sample size is 770 in all specifications. The dummy variables that capture employee well-being were measured in 2008. The outsourcing measures are for the 2001-2006 period. The estimation sample consists of employees who were employed in the same firm over the 2006-2008 period. The baseline category in all specifications is that a firm has neither outsourced domestically nor offshored its core business functions during the 2001-2006 period. All specifications include the following (unreported) individual-level control variables: female indicator, age groups, marital status, education, union status, past earnings, past employment, past unemployment, self-assessed health, plant size groups, and the indicators for the sectors of the economy. The baseline for occupational groups consists of managers and professionals. The results from linear probability models based on OLS are reported in Column 1 and marginal effects from probit models are reported in Columns 2-5. Standard errors are adjusted for clustering at the level of the firms for which employees work. Statistical significance: *** $p<0.01$, ** $p<0.05$, and * $p<0.1$.

TABLE 4. THE RELATIONSHIP BETWEEN OCCUPATIONAL RESTRUCTURING AND PERCEIVED WELL-BEING

Panel A: All employees	Job satisfaction (1)	Uncertainty (2)	No promotion (3)	No voice (4)	Work intensity (5)
Destruction: jobs	0.0195	0.0311	0.00339	-0.0393	0.0241
Destruction: workers	-0.0147	0.0415	-0.0347	-0.0211	0.0406
Creation: jobs	0.0114	0.0389	-0.0153	-0.000434	-0.0118
Creation: workers	0.00334	0.0561	-0.0338	0.0035	-0.00750
Reallocation: excess job reallocation	-0.0908	0.0310	0.0244	-0.0319	0.0286
Reallocation: intra-firm mobility	0.0165	-0.0106	-0.103	-0.0727	0.194***
Work content: change in share of interactive tasks	0.0458	-0.603**	-0.0773	-0.460*	-0.142
Work content: change in share of non-routine tasks	0.0642	-0.395**	-0.0578	-0.258	-0.0164
Work content: change in share of knowledge workers	0.0191	-0.106	0.000836	-0.212**	0.0200
Panel B: Knowledge workers	Job satisfaction (1)	Uncertainty (2)	No promotion (3)	No voice (4)	Work intensity (5)
Destruction: jobs	0.0696	-0.000845	-0.0439	-0.0821	-0.0432
Destruction: workers	0.0183	0.0282	-0.00474	-0.0446	-0.00926
Creation: jobs	-0.0260	0.0424	0.0358	0.0450	0.0185
Creation: workers	-0.0481	0.0669	0.0580	0.0670	0.0315
Reallocation: excess job reallocation	-0.0870	0.0462	0.0947	0.00521	0.0392
Reallocation: intra-firm mobility	0.0161	0.0180	-0.0117	-0.0653	0.128
Work content: change in share of interactive tasks	-0.143	-0.555*	-0.0630	-1.181***	-0.289
Work content: change in share of non-routine tasks	0.0424	-0.386*	-0.202	-0.803***	-0.0896
Work content: change in share of knowledge workers	0.0997	-0.175	-0.0754	-0.459***	-0.0302

Notes: The sample size is 1,174 in specifications. The dummy variables that capture employee well-being were measured in 2008. The measures for occupational restructuring are for the 2000-2006 period and are calculated only for continuous firms. The sample consists of employees who were employed in the same firm over the 2006-2008 period. Destruction is measured by job destruction ("jobs" in the table) and worker separation ("workers"). Creation is captured by job creation ("jobs") and worker hiring ("workers"). Excess job reallocation measures simultaneous job creation and destruction at the firm-occupation level. Intra-firm mobility is measured by internal worker separation, which corresponds to internal worker hiring. Work content is measured by the changes in the shares of interactive tasks, non-routine tasks and knowledge workers in firms. Each cell of the table reports the parameter estimate from a separate specification. All specifications include the following individual-level control variables: female indicator, age groups, marital status, education, union status, past earnings, past employment, past unemployment, self-assessed health, plant size groups, and the indicators for the sectors of the economy. The occupational groups are also controlled for in all models. The results from linear probability models based on OLS are reported in Column 1 and marginal effects from probit models are reported in Columns 2-5. The unreported standard errors are adjusted for clustering at the level of the firms for which employees work. Statistical significance: *** $p<0.01$, ** $p<0.05$, and * $p<0.1$.

APPENDIX

TABLE A1

DEFINITIONS OF VARIABLES

Variable	Definition/measurement
The measures of perceived employee well-being (QWLS)	
Job satisfaction	Job satisfaction is measured with an indicator for those who are "very satisfied" with their work = 1, otherwise = 0
Uncertainty	Work including at least one insecurity factor (includes transfer to other duties, threat of temporary dismissal, threat of permanent dismissal, threat of unemployment, threat of becoming incapable of work, unforeseen changes, work load increasing beyond tolerance) = 1, otherwise = 0
No promotion	Advancement opportunities in current workplace: 'poor' = 1, otherwise = 0
No voice	'Not at all' able to influence at least one factor at work (includes content of tasks, order in which tasks are completed, pace of work, working methods, division of tasks among employees, choice of working partners, equipment purchases) = 1, otherwise = 0
Work intensity	Intensity at work is sufficiently high to cause sickness absence = 1, otherwise = 0
The measures of outsourcing (ISS)	
Domestic outsourcing	Firm has domestically outsourced its core business functions (i.e., production of goods and/or services) over the 2001-2006 period = 1, otherwise = 0
Offshoring (i.e., international outsourcing)	Firm has offshored abroad its core business functions over the 2001-2006 period = 1, otherwise = 0. Offshoring covers both in-house and out-of-house offshoring.
Offshoring to the 15 EU countries	Firm has offshored its core business functions to one of the 15 EU countries over the 2001-2006 period = 1, otherwise = 0. The 15 EU countries are Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Sweden, and the United Kingdom. Finland is excluded from the list of 15 EU countries.
Offshoring to the rest of Europe	Firm has offshored its core business functions to the rest of Europe over the 2001-2006 period = 1, otherwise = 0. The rest of Europe includes 12 EU countries (i.e., the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia, the Slovak Republic, Bulgaria, and Romania) and Switzerland, Norway, Turkey, Russia, Belo Russia, Ukraine, and the Balkan states.
Offshoring to developing countries	Firm has offshored its core business functions to developing countries over the 2001-2006 period = 1, otherwise = 0. The developing countries include China, India, South and Central America (including Mexico), and Africa.
Offshoring to other developed countries	Firm has offshored its core business functions to other developed countries over the 2001- 2006 period = 1, otherwise = 0. The other developed countries include the United States, Canada, Japan, Korea, the countries of the Near East and the Far East, and Oceania.
Control variables	
Human capital (QWLS)	
Female	1 = female, 0 = male.
Age <=34	Age <= 34 = 1, otherwise = 0.
Age 35-44	Age 35-44 = 1, otherwise = 0 (reference)
Age 45-54	Age 45-54 = 1, otherwise = 0
Age 55-64	Age 55-64 = 1, otherwise = 0
Married	Married = 1, otherwise = 0.
Basic education only	Less than second stage of secondary education (International Standard

	Classification of Education (ISCED) 0-2) = 1, otherwise = 0 (reference)
Middle education	Second stage of secondary education (ISCED 3) = 1, otherwise = 0
Higher education	Third-level education (ISCED 5-7) = 1, otherwise = 0
Union member	Member of trade union = 1, otherwise = 0
Work history (FLEED)	
Past earnings	A logarithm of past average earnings over the 1990-2007 period, deflated to the year 2000 using the consumer price index.
Past employment	The total number of employment months over the 1990-2007 period.
Past unemployment	The total number of unemployment months over the 1990-2007 period.
Self-assessed health (QWLS)	Self-assessment of working capacity. The variable is scaled from 0 (total inability to work) to 10 (top condition).
Employer characteristics (QWLS)	
Plant size <100	Size of plant under 100 employees = 1, otherwise = 0 (reference)
Plant size 100-249	Size of plant 100-249 employees = 1, otherwise = 0
Plant size 250-999	Size of plant 250-999 employees = 1, otherwise = 0
Plant size > 1000	Size of plant over 1000 employees = 1, otherwise = 0

Note: The measures of occupational restructuring are defined in the text.

TABLE A2

DESCRIPTIVE EVIDENCE FOR THE FIRMS WITH RESPECT TO OFFSHORING

	Firms that have…						
	not offshored			*offshored*			Difference
Measure of occupational restructuring	N	Weighted N	Mean	N	Weighted N	Mean	of mean
	(1)	(2)	(3)	(4)	(5)	(6)	(7)=(6)-(3)
Job destruction	966	301561	0.178	130	52138	0.357	0.179
Worker separation	966	301561	0.537	130	52138	0.705	0.168
Job creation	966	301561	0.409	130	52138	0.262	-0.147
Worker hiring	966	301561	0.768	130	52138	0.610	-0.158
Excess job reallocation	966	301561	0.172	130	52138	0.159	-0.013
Intra-firm mobility	966	301561	0.162	130	52138	0.197	0.035
Change in share of interactive tasks	966	301561	0.005	130	52138	0.019	0.014
Change in share of non-routine tasks	966	301561	0.011	130	52138	0.030	0.019
Change in share of knowledge workers	966	301561	0.019	130	52138	0.041	0.021

TABLE A3

CORRELATIONS BETWEEN THE VARIABLES THAT DESCRIBE WORKING CONDITIONS

	Job satisfaction	Uncertainty	No promotion	No voice	Work intensity
Job satisfaction	1				
Uncertainty	-0.163	1			
No promotion	-0.117	n.s.	1		
No voice	-0.0833	0.0968	0.277	1	
Work intensity	-0.0893	0.155	0.0888	0.177	1

Note: n.s. indicates that the correlation coefficient is not statistically significant at the standard 5% level.

TABLE A4

THE RELATIONSHIP BETWEEN OUTSOURCING AND PERCEIVED WELL-BEING FOR KNOWLEDGE EMPLOYEES

Panel A	Job satisfaction	Uncertainty	No promotion	No voice	Work intensity
	(1)	(2)	(3)	(4)	(5)
Domestic outsourcing	0.0434	0.0308	0.0579	-0.00831	0.0501
	(0.0527)	(0.0540)	(0.0680)	(0.0623)	(0.0449)
Offshoring	-0.0305	-0.0899	-0.0487	0.0325	-0.0430
	(0.0596)	(0.0797)	(0.0749)	(0.0730)	(0.0404)
Panel B	Job satisfaction	Uncertainty	No promotion	No voice	Work intensity
	(1)	(2)	(3)	(4)	(5)
Domestic outsourcing	0.0566	0.0133	0.0968	0.0164	0.0592
	(0.0533)	(0.0535)	(0.0721)	(0.0642)	(0.0451)
Offshoring to …					
The 15 EU countries	0.105	-0.0738	0.0896	0.0435	-0.0148
	(0.0908)	(0.121)	(0.129)	(0.115)	(0.0640)
The rest of Europe	0.00694	-0.231*	-0.0581	0.0872	0.0843
	(0.0729)	(0.120)	(0.102)	(0.0939)	(0.0702)
Developing countries	-0.124	0.0426	-0.123	-0.0887	-0.103***
	(0.0847)	(0.106)	(0.115)	(0.134)	(0.0239)
Other developed countries	-0.0470	0.169**	-0.175**	-0.180	-0.0292
	(0.109)	(0.0908)	(0.0835)	(0.163)	(0.0848)

Notes: The sample size is 421 in all specifications. The dummy variables that capture employee well-being were measured in 2008. The outsourcing measures are for the 2001-2006 period. The estimation sample consists of employees who were employed in the same firm over the 2006-2008 period. The baseline category in all specifications is that a firm has neither outsourced domestically nor offshored its core business functions during the 2001-2006 period. All specifications include the following individual-level control variables: female indicator, age groups, marital status, education, union status, past earnings, past employment, past unemployment, self-assessed health, plant size groups, and the indicators for the sectors of the economy. All models also control for occupational groups. The results from linear probability models based on OLS are reported in Column 1 and marginal effects from probit models are reported in Columns 2-5. Standard errors are adjusted for clustering at the level of the firms for which employees work. Statistical significance: *** $p<0.01$, ** $p<0.05$, and * $p<0.1$.

[1] Offshoring in the firm-level survey that we use in this paper captures both sourcing business functions abroad within the same enterprise group (i.e., in-house offshoring) and to external foreign suppliers (i.e., out-of-house offshoring). Helpman (2006) provides an in-depth discussion of the definitions of outsourcing.

[2] Blinder (2006) claims that offshoring constitutes the next industrial revolution. Malone et al. (2011) argue that as a consequence of this development, the work in developed countries will be 'atomized' into ever-smaller pieces. Offshoring has led to a substantial vertical fragmentation of production. Linden et al. (2007) describe this process in the context of the production of Apple's iPod, and Ali-Yrkkö et al. (2011) discuss it in the context of the value chain of a Nokia smartphone.

[3] To identify the effects of offshoring on wages and employment, Criscuolo and Garicano (2010) use information on legal licensing requirements that limit the ability of certain tasks to be undertaken offshore. In addition to wage and employment other outcomes have also been studied; for example, Hummels et al. (2012) examine the training effects of offshoring in the Danish context. Hickman and Olney (2011) argue that employees have responded to offshoring by increasing their stock of human capital by acquiring better education in the U.S. context.

[4] See Crinò (2009) and Eriksson (2010) for surveys of the labor market effects of multinational firms, internationalization, and offshoring.

[5] Firm-level surveys of several EU countries show that the majority of firms in most countries expect that their offshoring activities will destroy more jobs than they create new ones in the home country. However, there also appears to be a silver lining, because firms in many countries anticipate that offshoring will stimulate the domestic creation of new high-skill jobs (Alajääskö 2009).

[6] The focus on within-industry effects implies that the employees in our analyses are affected only by outsourcing activities in their respective firms. Employees can change jobs more easily between firms than between industries because of the industry-specific nature of most human capital. This focus implies that we examine partial equilibrium effects. However, outsourcing is more precisely measured at the firm level. There is also an emerging body of literature

on offshoring that uses individual-level, i.e. person data, while allowing for cross-industry effects (Ebenstein et al. 2013; Geishecker and Görg 2013).

[7] See http://ec.europa.eu/public_opinion/index_en.htm.

[8] There is also a large literature on the non-pecuniary effects of job loss (e.g., Schmitz 2011; Young 2012; Black et al. 2012).

[9] Barth (1997) argues that human capital has a limited role in explaining why wages increase with seniority. His results provide support for the theory of delayed compensation by Lazear (1981).

[10] Ali-Yrkkö (2007) has reported that cost savings have been an important motivation behind outsourcing for Finnish companies.

[11] Skilled agricultural and fishery workers are excluded from the analysis because we focus solely on the non-farming business sector. Our general framework resembles the approaches of Bauer and Bender (2004) and Askenazy and Moreno Galbis (2007), who also study intra-firm organizational changes.

[12] One useful property of using average employment as a denominator is that the growth rates are symmetric around zero (Davis and Haltiwanger 1999).

[13] We find it rather difficult to argue that work content varies drastically in multinational firms and/or in other medium-sized and large firms that are heavily exposed to international trade and competition. However, we cannot completely rule out this possibility, which therefore constitutes a limitation of our approach.

[14] Hopp et al. (2009) consider specific aspects of white-collar tasks at the individual, team and organization levels.

[15] The definition of a core business function is the production of final goods or services that are intended for the market or for third parties that are conducted by the enterprise and yield income. In most cases, the core business function is the

primary activity of an enterprise. This function may also include other (secondary) activities if an enterprise considers these activities to be among its core functions (Statistics Denmark et al. 2008, p. 13).

[16] Maliranta (2009; 2013) provides detailed descriptive evidence on occupational restructuring in the context of the Finnish business sector.

[17] The most common elements of uncertainty are 'unforeseen changes', 'work load increases beyond tolerance', and 'transfer to other duties'. These components of uncertainty typically affect the same employees. The perception of the threat of becoming incapable of work is also common (25% of all employees). This threat is much more frequent among older employees, as expected. Note that we control for age effects in all specifications for perceived well-being.

[18] Relatively small sample sizes in some specifications explain why the 95% confidence intervals for the estimates can be quite wide.

[19] We use the average employment in 2000 and 2006 as weight.

[20] Note that these specifications do not control for employment restructuring in firms.

[21] Therefore, the inference concerns this particular population (cf. Wooldridge 2010, p. 790). Equation (2) can be interpreted as a test of the existence of compensating wage differentials because outsourcing can be viewed as a potential disamenity from the employee perspective. It can be shown that wages should not be included among the right-hand side variables of the equation if the objective is to test for the existence of compensating wage differentials using information on subjective well-being (see Böckerman et al. 2011).

[22] However, it is not possible to provide a causal interpretation for the estimates in Table 2. Thus, the positive coefficient in Column 1 may result from simultaneity, and it is therefore possible that firms downsize their workforce in response to a negative firm-specific shock in business conditions (the models include the industry indicators) and simultaneously resort to offshoring to reduce labor costs.

[23] Appendix (Table A2) documents the average unconditional differences in occupational restructuring between firms that have undertaken offshoring and those that have not. The differences are striking. For example, the job destruction rate at the firm-occupation level in firms that have engaged in offshoring is 35.7 percent, which is 17.9 percentage points higher than in other firms. These figures are fully consistent with our regression results in Table 2 that control for covariates.

[24] This finding may also result from reverse causality (i.e., firms with a higher proportion of knowledge workers are more capable of managing activities in different countries and are thus more likely to resort to offshoring).

[25] The correlations between the variables that capture working conditions are reported in Table A3.

[26] Some might expect to find similar relationships when the destination of offshoring has been one of the 15 EU countries (or the home country); however, indications of such associations were not found.

[27] These aspects capture harm and hazards in the workplace, as defined in Böckerman and Ilmakunnas (2009).