Job-Related Well-Being Through the Great Recession

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Abstract

We study how job-related well-being (measured by Warr’s ‘Enthusiasm’ and ‘Contentment’ scales) altered through the Great Recession, and how this is related to changing job quality. Using nationally representative data for Britain, we find that job-related well-being was stable between 2001 and 2006, but then declined between 2006 and 2012. We report relevant changes in job quality. In modelling the determinants of job-related well-being, we confirm several core hypotheses and present some new findings. We find that indicators of skills challenge in jobs have more of a positive association with Enthusiasm than with Contentment, while effort has a more negative association with Contentment than with Enthusiasm. We find that our estimates are largely orthogonal to the effects of personality traits and demographic controls on well-being. Extending the model to include the direct effects of workplace change, we find that downsizing, work re-organisation and decreased choice are each associated directly with lower job-related well-being. Using a standard decomposition, we find that the 2006-2012 fall in job-related well-being is partly accounted for by accelerations in the pace of workplace change, rising job insecurity, increased effort and changing participation.
Job-Related Well-Being Through the Great Recession

Introduction

Periods of economic crisis and stagnation are typically seen as occasions for accelerated changes in employment and production relations. Whether through Schumpeterian creative destruction or through a shift in the balance of power, the opportunity may be taken to renew working methods, relationships and pay bargains, with consequences for both employers and their employees. This paper is concerned with what happens to the well-being of those in employment, taking the specific instance of workers in Britain before and after the 'Great Recession' of 2008-9. Major economic downturns are known to generate falls in general well-being, as manifested in overall life satisfaction and health indicators. Moreover, these reductions in well-being extend beyond those rendered involuntarily unemployed to the broader workforce who feel less secure and to their dependants (Burchell, 1994; Di Tella et al., 2003; Green, 2011). The focus here, however, is on how job-related well-being (feelings about one's job) altered through the Great Recession, and on how this is related to changing job quality.

Since job-related well-being is an end in itself, studying it needs no additional motivation, and in recent years it has been assigned a place in the ‘beyond GDP’ agenda (Stiglitz et al., 2009). Nevertheless, there is evidence that job-related well-being is associated with productivity, absenteeism and labour turnover (Warr, 2007; Böckerman and Ilmakunnas, 2012) – even if much remains to be done to determine the magnitude of the causal effects. A better understanding of the various dimensions of well-being should also prove helpful in the analysis of labour markets. The issue hitherto has been the scarcity of economy-wide representative data containing good indicators of job-related well-being over time.

Our first aim in this paper is to show what has been happening to the economy-wide average level of job-related well-being. Since 2001 we have collected three cross-sections of large-scale nationally-representative data, with which we can document the trend in two dimensions of
job-related well-being, using indicators devised by Warr (1990a; 2007), namely the scales of ‘Enthusiasm’ and ‘Contentment’.¹

Our second aim is to decompose the differences in job-related well-being over time, showing the proportions of these differences that can be ‘explained’ by variation in observed measures of job quality, and how much is left unexplained. Economics, psychology and sociology all provide theory as to how job characteristics are expected to be related to well-being. We fit models derived from four core theories, concerning the effects of effort (job demands), participation, skills challenge and insecurity. While confirming prior findings, this process adds new ones concerning variations between different dimensions of well-being, the non-linearity of effort's effect on well-being and the effects of performance-related pay. We extend these models to estimate the direct links between well-being and recent changes in the organisation, in particular those changes that are heightened in recession such as downsizing.

Much of the existing empirical evidence surrounding the links between job quality and well-being has been based on relatively small-scale studies with data that are unrepresentative of the whole economy and that contain relatively few controls, making it difficult to generalise their findings or to defend strong claims about the causal nature of the relationships under examination. Unobserved variables associated with personal and job characteristics may be affecting both sides of the equation. In particular, if personality, which is known to be strongly correlated with subjective well-being, also plays a part in allocation to jobs this will be a potential source of bias in estimates of the causal effects of job quality on well-being. Although we are not in a position to fully resolve this issue using panel data or quasi-experimental methods, a third aim of the paper is to try to uncover whether cross-sectional estimates are likely to be substantially biased by the exclusion of person-fixed effects. We are able to do this by including a rich array of usually-unavailable variables concerning personality traits and individuals' family background – including the support they received in childhood, their current family circumstances, region of residence, and age – in order to examine whether the

¹ While these dimensions are formally termed ‘Depression-Enthusiasm’ and ‘Anxiety-Contentment’, we prefer to use a shortened nomenclature where it is transparent that an increase in the scale represents a rise in well-being.
relationships of job quality with well-being are substantially affected by their inclusion, or whether they can be regarded as orthogonal to such person-fixed effects.

The paper proceeds, first, by clarifying the concept of job-related well-being and outlining the core theories and existing evidence. The next section describes our data and all the relevant indicators, followed by presentation of a picture of changing well-being and of changing job quality. Model findings are then presented, culminating in a decomposition analysis.

Theory and prior evidence linking job characteristics and job-related well-being

A considerable body of psychological research has suggested that there are two substantive, if not exhaustive, orthogonal dimensions to the structure of feelings, namely ‘arousal’ and ‘pleasure’. This structure applies to feelings arising from both work and non-work settings. Rather than measure each dimension separately, Warr (1990a) has examined and validated instruments (to be described below) that tap two correlated dimensions within the ‘arousal’/‘pleasure’ plane, namely 'Depression-Enthusiasm' and 'Anxiety-Contentment'. Henceforth we shall refer to these dimensions with the shorthand of the positive noun only. 'Enthusiasm' is positively correlated with the arousal and pleasure axes; 'Contentment', by contrast, is correlated positively with the ‘pleasure’ dimension but negatively with the ‘arousal’ dimension. Applied to the job, these two dimensions are found to affect behaviour, including quitting and absenteeism.\(^2\)

One can think of the determination of each dimension \((i)\) of job-related well-being \(JWB_i\) as:

\[
JWB_i = f(JQ_{ij}, X_{ik}),
\]

where \(JQ_{ij}\) is that subset of job characteristics which meet people's needs from work, and \(X_{ik}\) is a vector of personal and environmental characteristics. This simple framework enables us to set the findings of previous studies, to highlight some hypotheses not previously tested with nationally representative data, and to frame an

\(^2\) However, they should not be conceptually equated to neoclassical decision utility, not least because behaviour also stems from norms and expectations about alternatives. Studies are reviewed in Warr (2007, pp427-434); see Green (2010) for a recent longitudinal study.
expectation about how job-related well-being will change in a recession. We draw on core literatures to formulate hypotheses about the links between jobs and well-being, focusing on effort (job demands), participation, skills, insecurity and workplace change, and cite examples of supporting empirical evidence.

**Effort**

Economics has evolved the view that work effort is a disutility at the margin, a ‘bad’, something that has to be experienced in order to earn a wage (Spencer, 2012). In this it parallels modern psychology, where ‘work overload’ is assumed to be detrimental to well-being (Warr, 2007; Wichert, 2003). Effort is comprised of both work intensity (sometimes referred to as ‘job demands’) and work duration. The former is complex, entailing a mix of physical, mental and emotional demands at work, and involves added measurement issues due to its lack of a standard metric. Both economics and psychology take the relationship of effort with well-being to be non-linear, with increasing negative marginal effects. Since this stimulation affects the arousal dimension, it is predicted that effort’s effect on Enthusiasm is less negative than its effect on Contentment (Warr, 1990b). These hypotheses may be summarised as:

- H1: effort has an overall negative association with well-being.
- H2: the magnitude of the marginal negative effect is greater at higher effort levels
- H3: the marginal effect is less negative (more positive) in respect of Enthusiasm than in respect of Contentment.

H1 and H2 underpin labour supply theory in economics, and as such are indirectly attested by the voluminous empirical literature on labour supply (e.g. Hamermesh, 1993; Ashenfelter et al., 2010). Direct psychological studies using measures of work intensity have varied findings: some report that high job demands are associated with lower levels of job satisfaction and/or Contentment-Anxiety, while others find a very low correlation between job satisfaction and effort (Warr, 2007: 165-170; Wood and de Menezes, 2013). Cottini and Lucifora (2013) report that higher work intensity is a source of increased mental health problems. There appears to be
no direct psychological evidence for, or against, H2, and neither direct nor indirect evidence about H3.

 Participation

In several complementary literatures from psychology, management and economics, participation is assumed to have usually beneficial effects on job-related well-being. It is useful to distinguish between two types -- decision-making participation (at various levels) and financial participation in outcomes. At the level of workers' own jobs, decision-making participation (that is, ‘task discretion’ over aspects of the tasks to be performed) affects well-being because it enhances workers’ autonomy and control. From the economic perspective, the level of control afforded to individual workers will depend on workers' preferences (organisational commitment) and the monitoring structure (Green, 2008), while from the sociological perspective workers' preferences are also determined by the level of trust which is linked with control (Fox, 1980). According to the 'demand-control' model, the impact of task discretion on well-being is greater where work intensity is high, because higher control allows workers to partially counter the stressful effects of high-intensity work (Karasek, 1979; Karasek and Theorell, 1989). From the management theorists' perspective, task discretion is just one element in the model of ‘high involvement management (HIM)’ which is advanced as delivering higher organisational effectiveness. Another element in the HIM model, also stressed within the sociological literature, is involvement in decisions about the organisation (Wood and de Menezes, 2013). Indicators typically cover both upward and downward information flows, including suggestion schemes, consultative meetings and the use of quality circles. Involvement through representative consultation, through recognised trade unions, is also included here. These types of organisational involvement are also argued to be beneficial for well-being.

These effects apply to both dimensions of well-being, with no expectation of having stronger effects for one or other. Thus we have further hypotheses:

- H4: Task discretion is positively related to well-being.
- H5: The effect of task discretion on well-being is greater at high levels of work intensity.
• H6: Well-being is also enhanced by organisational participation

Much evidence supports H4 (e.g. Cottini and Lucifora, 2013) and H5 (Eller et al., 2009), though with H5 the recent evidence for an interaction effect on health is equivocal. There is also evidence that well-being is enhanced where the teams through which work is organised are granted some autonomy (Böckerman et al., 2012; Gallie et al., 2012). H6 is also well-supported, though the size of the effect has been found to be less than for H4 (Gallie, 2013).

The anticipated effects of financial participation on well-being are, by contrast, ambivalent. Financial participation refers to the presence of economic incentives through schemes that link rewards with performance. On one hand, the uncertainty of performance outcomes introduces an element of risk which, except for risk lovers, could be expected to lower well-being (similar to the stressor effects of job insecurity, discussed below). The uncertainty may be greater for pay linked to organisational rather than individual performance. Yet it is also hypothesised that individual piece rates may induce overworking in some jobs and hence greater physical risk-taking (Roy, 1952; Bender et al., 2012). On the other hand, performance pay might attract workers with a preference for risk and reward. Moreover, offering collective financial participation is argued to stimulate commitment, increasing the value that workers attach to being part of the organisation (Wood and de Menezes, 2012). Similarly, employee discounted share-purchase plans have been interpreted within the framework of a gift exchange of effort for reward (Bryson and Freeman 2012). The association with both well-being domains depends on which if either of these opposing effects predominates. These arguments may be posed as competing hypotheses:

• H7: financial participation is positively related to well-being.
• H8: financial participation is negatively related to well-being.

Evidence hitherto is scarce and mixed, tending if anything to favour H8 over H7. Wood and de Menezes (2012) find no significant impact from either individual or group performance-related pay on Contentment. Less neutral, however, is evidence suggesting that performance pay raises injury rates (e.g. Saha et al., 2004; Bender et al., 2012) while Freeman and Kleiner (2005) find a
positive association with compensation costs. Performance pay is also found to have negative effects on general health (Foster and Rosenweig, 1994; Bender and Theodossiou, 2013).

**Skills challenge**

By the umbrella concept "skills challenge" we refer here to the extent to which the work itself challenges employees to use their skills. The idea that a good degree of challenge can make people happier has a long lineage. Because of the putative link between skill use and the emotion of arousal as well as pleasure, Warr (2007) proposes in addition the hypothesis that opportunity for skill use is more strongly associated with Enthusiasm than with Contentment. A related aspect of the skill challenge is the variety encountered in a job and the need to learn new things, both of which would be expected to have the same differential effects on well-being. Finally, the extent to which jobs involve carrying out repetitive tasks might be expected to have negative effects on Enthusiasm, but less of a detrimental effect on Contentment.

- H9: Greater use of workers’ skills is associated with higher well-being.
- H10: The effect of skills challenge on Enthusiasm is stronger than its effect on Contentment.

For H9, a substantial amount of psychological evidence establishes that work which better enables people to use their abilities is associated with greater well-being (e.g. Kornhauser, 1965; O'Brien, 1980). In a similar vein, labour economists have reported a significant negative association between either overeducation or skill underutilisation and job satisfaction (e.g. Allen and van der Velden, 2001; Green and Zhu, 2010). However, there is hitherto no evidence pertaining to H10.

**Insecurity**

The fourth set of theories we incorporate concern insecurity, which is seen as a stressor with detrimental effects on well-being, stemming from the associated loss of control (Greenhalgh and Rosenblatt, 1984). The impact of insecurity has also been interpreted as contributing to a repudiation of the implicit ‘psychological contract’ (Mauno et al., 2005) or as part of a shift in
power relations (Scott, 2004). Our primary focus is on the risk of job loss, which is expected to affect Enthusiasm and Contentment directly, in that it is uncertain whether they will experience the future well-being associated with having a job per se, and indirectly through its impact on expected income.\(^3\) The main hypothesis is therefore:

- **H11**: Job insecurity is negatively related to well-being.

H11 is robustly supported by voluminous evidence from studies of ex-ante job insecurity (e.g. Burchell 1994; Nolan et al., 2000; Wichert, 2002; Cheng and Chan, 2008; Green, 2011) and indirectly from studies of ex-post indicators such as job loss and unemployment (e.g. Di Tella et al., 2003; Theodossiou, 1998).\(^4\)

**Workplace change**

Workplace change may have an indirect effect on well-being, through its effects on any of the above aspects of job quality. Yet change may also have a direct effect.

A direct negative impact on well-being is to be expected from the disruptions of restructuring -- employment downsizing, pay cuts, new technologies and work re-organisation. For example, it is held that, for those employees who 'survive' it without losing their jobs, downsizing is a rupture in the 'psychological contract' which reduces their organisational commitment and well-being. A counter-argument sometimes posed, however, is that if job-related well-being is assessed relative to those made redundant, there could be a positive survivor effect among those in work during a recession – a feeling of relief that their jobs have not been lost. There may also be direct effects (positive or negative) on well-being from changing jobs.

- **H12**: Disruptive workplace changes are negatively associated with well-being, conditional on their indirect effects via changing job characteristics.
- **H13**: Surviving downsizing could be associated with relative relief, hence greater well-being.

\(^3\) Yet security can also entail uncertainty over valued job features within the current job, including fears of unfair treatment or loss of job status. Gallie et al. (2013) show that these fears became more prevalent between 2000 and 2012.

\(^4\) Expectations of job loss are reasonably well correlated with subsequent job loss frequencies (Stephens, 2004; Dickerson and Green, 2009).
The evidence hitherto favours H12, not H13. Bryson et al. (2013), for example, report that changes in work organisation are associated with lower Contentment, but that this effect is ameliorated where unions with bargaining rights are consulted over the reorganisation. Datta et al. (2010) review evidence that downsizing tends to lower job satisfaction and organisational commitment. Typically, studies report greater negative direct effects on survivors of downsizing the nearer they are to being involved, and the less fair are the perceived processes (Pepper et al., 2003).

The Expected Effect of Recession

These hypotheses enable us to frame an expectation about the impact of economic downturns on job-related well-being. Recessions, which are expected to be a time of accelerated restructuring and workplace change, could affect the well-being of those remaining in work both directly and indirectly. Directly, recessions' expected effects on well-being hinge on H12 and H13. Indirectly recessions may alter other job characteristics, and the potential effects are also uncertain. On one hand, in a recession employers’ bargaining power is increased, thus enabling them to enforce a greater level of work effort; recession and stagnation could also be expected to elevate both the fear of both job loss and anxiety about unfair treatment (Gallie et al., 2013). On the other hand labour hoarding in recessions implies lower effort and hours. There could also be a selection effect, with surviving workers more likely to have higher productivity than those laid off, and greater well-being.

Given the depth of the Great Recession, our prior expectation was that the rising prevalence of insecurity, restructuring and other deteriorations in job quality would lead to a reduction in well-being in both dimensions. In what follows our aim is, not to test whether the Great Recession caused changes in well-being, but to investigate what happened and how far factors associated with recession, such as restructuring and rising insecurity, were present and are associated with well-being. Specifically, we ask: what happened to the two dimensions of job-related well-being between 2006 (before the recession) and 2012? How far was the pace of restructuring and workplace change heightened in this interval? How did core elements of job quality change between these two dates? In the light of our estimates of the association of job
characteristics and of workplace change with job-related well-being, we then decompose the observed change into a part that can be ‘accounted for’ by accelerated workplace change and by changes in job quality, and a residual that cannot be linked to observed variables.

**Data and indicators**

To examine these questions, together with the hypotheses derived from the core theories, we use data from the British Skills and Employment Surveys, a series of periodic nationally representative sample surveys of individuals in employment which we have collected. Survey details are reported in Felstead et al. (2002; 2007) and, for 2012, at http://www.llakes.org/. The surveys collected responses from working adults interviewed in their own homes. The samples were drawn using random probability principles subject to stratification based on socio-economic indicators, and only one eligible respondent per address was randomly selected for interview. Weights were computed to take into account the differential probabilities of sample selection, the over-sampling of certain areas and some small response rate variations between groups (defined by sex, age and occupation); all of the analyses that follow use these weights. We focus here only on employees, because some of the key variables under study, notably participation and insecurity, are likely to be interpreted somewhat differently by the self-employed.

We collected data on job-related well-being using Warr's scales in the 2001, 2006 and 2012 surveys. To measure the two dimensions of job-related well-being – Enthusiasm and Contentment – a series of items was introduced with the words: ‘Thinking of the past few weeks, how much of the time has your job made you feel each of the following...?’ each followed by an adjective describing a different feeling. For the Enthusiasm scale, the adjectives were ‘depressed’, ‘gloomy’, ‘miserable’, ‘cheerful’, ‘enthusiastic’ and ‘optimistic’. For the Contentment scale the adjectives were ‘tense’, ‘uneasy’, ‘worried’, ‘calm’, ‘contented’ and ‘relaxed’. Possible responses were ‘never’, ‘occasionally’, ‘some of the time’, ‘much of the time’,

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5 We use italics henceforth whenever we mean explicitly the derived scale, rather than just the concept which it is measuring.
‘most of the time’ and ‘all of the time’. Both scales are constructed by averaging the responses, having reversed the negative items, ranged from 1 to 6. In our samples the Cronbach’s alpha statistic was 0.81 for both Enthusiasm and Contentment, suggesting that it is reasonable to regard the elements of each scale as capturing an underlying trait.6

Work duration is indicated by the number of hours usually worked per week. To capture effort/job demands we used an indicator that would include multiple facets, constructed from seven elements: a) the perception of required hard work; b) the frequency of working to tight deadlines; c) the frequency of having to work at very high speeds; d) the frequency of experiencing difficulty to complete tasks in time; e) the frequency of returning home from work exhausted; f) the perception of putting in additional effort beyond requirements; g) average task demands (derived from 40 items).7 These seven items were combined, after standardising, into a single scale, with a Cronbach’s alpha statistic of 0.72.8

To generate a task discretion index capturing empowerment we use four items which assess how much personal influence people report over specific aspects of their jobs: how hard they work, deciding what tasks they are to do, how the tasks are done and the quality standards to which they work. The response options ranged from ‘a great deal’, ‘a fair amount’ to ‘not much’ and ‘not much at all’. A summary index was constructed, by taking the average of responses of the four items. The Cronbach’s alpha coefficient is 0.77. We also include a measure of whether employees experience autonomy through the teams they work in. We asked whether they worked in a group, and if so how much influence the team had over the same aspects of the team’s work. We generated a dummy variable indicator for ‘semi-autonomous’ team, equal to one if the employee worked in a team where the average amount of team influence was at least ‘a fair amount’, zero otherwise. Our measures of empowerment are then supplemented by a dummy variable indicating whether the worker has ‘a great deal’ of say in decisions that

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6 Typically, a job satisfaction scale has been thought of as an indicator for the ‘pleasure’ axis in a work setting; however, job satisfaction is also strongly affected by expectations driven by alternative job opportunities and previous experience. In principle the two concepts of Enthusiasm and Contentment, applied to work, better capture the complexity of feelings that are engendered by the job.

7 These task-based indicators are described fully elsewhere, e.g. Green (2012).

8 Our findings are not sensitive to reasonable alternative methods of constructing this intrinsic effort index.
change the way the job is done. Organisational involvement is indicated, first, by a dummy variable for participation in quality circles. Second, we computed an indicator (range 0-8) for organisational communications via meetings with management: the sum of the number of issues (finance, investment, working practices, company products, health and safety, training plans and other matters) that can be raised in consultative meetings and a dummy for information-giving meetings. We also included an indicator for union voice, a dummy variable for whether unions are present in the establishment and reported to have a ‘fair amount’ or ‘a great deal’ of influence over work organisation.

Financial participation is captured by three dummy variables indicating whether the respondent receives, as part of pay, a bonus linked to individual, team or organisational performance (the latter including the facility to participate in a share ownership or option scheme).

To capture skills challenge we used four indicators. Two were dummy variables covering whether the job required them to keep learning new things, and whether it never involved carrying out short, repetitive tasks. The third indicator is how much variety there is in the job. The fourth indicator captures how far respondents agreed with the statement ‘I have enough opportunity to use the knowledge and skills that I have’.

To capture job insecurity respondents were asked whether there was any chance of them becoming unemployed and losing their job in the next twelve months, and if so how likely this was on a five-point scale ranging from ‘very unlikely’ to ‘very likely’. In previous studies it has been shown that expectations of job loss are well-informed (Dickerson and Green, 2009; Stephens, 2004).

Several direct measures of workplace change are also included. We ascertained whether skills used had changed, respondents had been promoted or their choice over work methods had changed since a recent reference point. While some will have changed employer since the

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9 We asked respondents if they were in work 5 years prior to interview, and if so this would become their reference point for subsequent change questions. If not employed then, they were asked the same question about 4 years, then if not employed at that point, again about 3
reference point, among those that did not do so we ascertained whether new technology (specifically, new computerised or automated equipment) had been introduced, whether work had been reorganised, and whether there had been some downsizing (specifically, a reduction in the number of people doing the job).

**A picture of job-related well-being and (non-pay) job quality in Britain, 2001-2012.**

The first question we address is whether job-related well-being has risen, fallen, or remained stable through the recession. To set this in context, we also include the 2001 picture for this description. Pooling the data from all three waves, the *Enthusiasm* index has a mean of 4.27 while *Contentment* has a mean of 3.72. Table 1 shows that there was no significant change in job-related well-being between 2001 and 2006, but that in the next six years well-being fell significantly in both dimensions. The change was quite substantial, amounting to around 7% and 20% of the standard deviations of *Contentment* and *Enthusiasm* respectively. Thus, while in principle the direction of change in well-being in a recession could not be predicted, in practice the direction of change through the Great Recession was downwards.

The two indices can each be divided into sub-indices covering just the positive or just the negative items. Table 1 reveals that declines in the *Contentment* index over 2006 to 2012 occur for both negative and positive items, though the negative items decline somewhat more (0.24 compared with 0.11). With the *Enthusiasm* index only the negative items decline.

Differences can also be observed between the changes in the well-being of males and females. In the case of *Contentment* the index falls further for males than for females (0.24 compared with 0.11), while with *Enthusiasm* the index falls for males but not at all for females.

Having established that job-related well-being declined in the 2006-2012 period, we now examine what happened to the pace of workplace change and to our indicators of job quality. As can be seen in Table 2, there was an increase in intrinsic effort, especially between 2006 and 2012 years. This device enabled us to heighten the number of responses with qualitative information about recent workplace change.
2012 – a work intensification. Meanwhile working hours came down by a small amount from 2001. Individuals' task discretion remained largely stable overall through the decade. Starting in 2006 there was an increase in participation in semi-autonomous teamworking (from 14% to 18%), coupled by a small rise in the prevalence of team-based performance-related pay (16% to 18%). Communication between management and workers rose between 2001 and 2006 but thereafter stabilised. After 2006, the use of quality circles declined by a small amount, and there was also a more substantial reduction in the share reporting influence on changes in work methods (from 31% to 26%), while union voice and non-team forms of PRP were unchanged.

Skills challenges also went through small changes between 2006 and 2012, the most notable being a rise in repetitiveness (a fall from 23% to 20% in the prevalence of jobs which never entailed repetitive tasks), and a rise in the availability of opportunities for skill use.

There has been a rise in perceptions of the probability of job loss which accelerated after 2006: whereas in 2006 83% of employees felt that there was no chance of losing their job, or it was very unlikely, in 2012 the figure was down to 78%. Gallie et al. (2013) show that this rise was complemented by a rise between 2000 and 2012 in fears of unfair treatment in the workplace.

As the table shows, rising insecurity after 2006 is also accompanied by alterations in the pace of workplace change. Most notably, the proportion of employees reporting that there had been some downsizing in their job rose from 30% in 2006 to 41% in 2012. There were also falls in the prevalence of skill rises (58% to 54%), promotion (38% to 35%), workplaces with increasing job choice (41% to 36%), job mobility to another employer (43% to 39%), and the introduction of new technology (63% to 58%). These are the unsurprising accoutrements of the Great Recession in Britain.

The relevance of these job characteristics and the altered pace of change for our understanding of the changes in well-being depends on their associations with well-being, as implied by the core theories outlined above. We now therefore turn to an empirical model of these associations.
The determinants of well-being.

Table 3 presents our baseline model implied by core theories. We use the pooled nationally representative data for 2006 and 2012, in order to focus on the period in which well-being fell and because this enables us to use the full range of explanatory variables. Males and females are treated separately, since different domestic circumstances, preferences or opportunities may condition the effects of job quality indicators in distinct ways according to gender. We use the Seemingly Unrelated Regression estimator to allow for potential correlation of the residuals in the regressions for the two well-being dimensions.

The findings confirm previous studies showing the negative association of work intensity with well-being (H1). The findings also confirm a substantive positive effect of individual task discretion on the two dimensions of well-being (H4). Moreover, the interaction with work intensity is positive and significant in three cases, consistent with hypothesis H5 that the detrimental effects of work intensity are moderated by higher levels of personal discretion.

A new finding is that the estimates support the hypothesis (H3) that work intensity impinges more on Contentment than on Enthusiasm. Evaluated at its mean (zero) the standardised effect of work intensity for females is -0.55 on Contentment and -0.25 on Enthusiasm; for males, the equivalents are -0.39 and -0.27. These differences are each significant at 1%.

Concerning the non-linearity hypothesis (H2) the evidence is mixed. There is a negative coefficient on the square of work intensity in all four cases, but this is significant (at 1%) only in the case of females' Contentment index.

As regards work hours the relationship with Enthusiasm is U-shaped, supporting H1 only up to a point and H2 not at all: the working week at which Enthusiasm is at a minimum is estimated to be 40 hours for men, 53 hours for women. This result is similar to previous findings in the literature which have found somewhat high levels of job satisfaction among those working very long hours (Benz, 2005): this association is interpretable as reflecting the endogenous determination of work hours, in that some of those work long hours are choosing to do so because they enjoy the work.
Indicators of organisational participation are also positively associated with well-being (H6). The strongest is ‘influence on change in work method’, which is significant for both dimensions and sexes; as an example, for females having 'a great deal' of say in organisational decisions that change the way work is done and has an effect on *Enthusiasm* of 0.26 (31% of its standard deviation). Semi-autonomous team-working (with high levels of team influence over tasks) has lower coefficients, yet these are significant in 3 out of 4 cases. Quality circle participation is associated with greater *Enthusiasm* for males, while the Organisational Communications indicator is linked with *Enthusiasm* for both sexes. Union voice is beneficial in raising *Contentment* for males.

Unlike earlier studies which report negative effects of individual-based financial participation, we find that receipt of individual or team-based pay is found to be insignificant. Participation in organisation-level performance schemes, however, is associated with significantly lower *Contentment* for males, weakly supporting H8 rather than H7.

The extent to which jobs are challenging is important in several ways. The estimates are consistent with previous studies, in that they show strong positive associations between the opportunity for skill use and well-being, and between job variety and well-being (H9). To illustrate how strong this effect is, for males the difference between a job with ‘a great deal’ of variety and one with ‘some’, ‘little’ or ‘none’, is 0.35 on the *Enthusiasm* scale, that is, 42% of its standard deviation. In addition, Warr’s hypothesis (H10) is confirmed for both these variables, in that the estimated link with Enthusiasm is greater than the link with *Contentment*.10

In respect of the requirement to learn new things (‘Learning’), the estimates show the expected positive association with *Enthusiasm* (significant for females), but for males the association with *Contentment* is significantly negative. Avoidance of repetitive tasks in a job is associated with greater Enthusiasm for males and, for both sexes, lower Contentment. Thus, with both these

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10 The coefficients differ significantly. Thus, for ‘Great Deal’ of variety p=0.00 for both sexes; for ‘Strongly disagree’ about enough opportunity for skill use, p=0.00 for females, p=0.08 for males).
indicators, H1 may need amendment to a stronger version: the effect of skills challenge on Contentment is not only less than its positive effect on Enthusiasm, it may become negative.

Finally, as predicted job insecurity is association with lower well-being in both dimensions (H11). This effect is large: for example, those females who think that they are ‘quite likely’ or ‘very likely’ to be losing their jobs in the coming year have a Contentment level of 0.31 (35% of sd) less than the reference category of secure employees.

**Two robustness issues: controlling for personality and the relationship with pay**

Table 3 shows that, taken together, the job characteristics account for between 15% and 20% of the variation in our measures of job-related well-being. Since these are cross-sections, however, the estimates do not establish causation. For the usual reasons, many of the job characteristics could be argued to be partially affected by other variables which also affect well-being, of which a prime candidate is personality; there could also be reverse causation. Moreover, it could be that the selection of individuals into employment is related to their well-being, which would also make for potential bias. Nevertheless, one could have greater confidence that the estimates are worth taking seriously as showing consistency with theory where it is possible to control for personality and other relevant personal characteristics. We therefore investigated whether the addition of such controls substantially altered the pattern of findings just described. To do this, our analysis was confined to the 2012 data, which contained indicators of the ‘Big Five’ personality traits – Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness. We included the scales derived from the short form version of these scales, designed and validated for use where interview time was scarce in large-scale surveys (Gosling et al., 2003; Muck et al., 2007).

The results of this exercise are shown in Appendix Tables A1m and A1f. Columns (1) and (2) include the variables used in Table 3, while columns (3) and (4) add the personality variables, then columns (5) and (6) add controls for age, education, ethnicity and childhood social
background (childhood financial security and parental interest). As expected, the introduction of the personality variables substantially increases the amount of well-being variation that is accounted for, for females reaching 37% for Enthusiasm and 30% for Contentment. Emotional Stability is especially strongly associated with both dimensions of well-being. The key observation, however, is that the estimates for the job characteristics in Columns (3) and (4) are not greatly different from those in Columns (1) and (2). The same observation holds for the further inclusion of demographic controls, which include age, ethnicity, education level, childhood financial security and parental interest in their school progress. Thus, despite the power of the personality variables to influence well-being, this effect, and that of other controls, appears to be largely orthogonal to the job quality variables of interest.

Pay, being part of income, has well-researched effects on well-being (Theodossiou, 1998). Knowing that they are being more highly paid could have an effect on workers' feelings as they go about their jobs, independently of pay's association with job characteristics. At the same time, however, pay is subject to compensating differentials as long as there is job heterogeneity and a degree of competition in the labour market. Jobs which deliver low levels of Contentment and/or Enthusiasm would be less desirable, ceteris paribus, and so entail through competition a pay premium. Because of these obvious endogenous effects, and because it would further reduce sample size via missing values, pay has been excluded from our presented estimates of the determinants of well-being. However, we tested whether the estimates on other variables are substantially altered depending on whether pay is included, and reassuringly found that this is not the case.

**Extension: workplace change and well-being**

There could be expected to be some difference between the columns (1) and (2) estimates and those from Table 3 covering the larger sample of pooled data. However, with a few exceptions the pattern of the findings for 2012 alone is similar to those for the whole period. Pay may also be connected to subjective well-being through effort-reward imbalance theory (Siegrist, 1996).
Table 4 extends the basic model of well-being to incorporate workplace change directly. In addition to the job quality variables entered into Table 3, we introduced dummy variables for changes in respondents' jobs, whether the respondent changed employer, and if not whether he/she experienced the various workplace changes noted in Table 2.\textsuperscript{13}

The table shows no significant associations with rising skills requirements, but promotion is associated with greater \textit{Enthusiasm} for males, and lower \textit{Contentment} for females. Decreased choice has detrimental effects for both dimensions for both sexes, while increased choice is beneficial for the \textit{Enthusiasm} of females. Having changed employer is associated with lower \textit{Contentment}. Among workplace changes, work re-organisation and (strongly) downsizing each have significant negative associations with well-being for both dimensions for both sexes. Males who report downsizing, for example, have an \textit{Enthusiasm} index that is 0.14 (17% of sd) lower than that of others where there is no downsizing. Since these models also contain, as controls, the same variables that were included in Table 3, these effects are supplementary to any indirect links that workplace change may have had with job characteristics and thence with well-being.

\textbf{Decomposing changes in well-being.}

We are now in a position to present, in Table 5, a conventional decomposition of the 2006-2012 fall in well-being into those that can be ‘accounted for’ by changes in the job quality variables and the workplace change variables, and those that remain unaccounted for by our observed variables. We use a simple pooled model of the 2006 and 2012 waves, with the same covariates as in Table 4.

Looking first at the decline for males in the \textit{Enthusiasm} index, of the fall of 0.108 just over a fifth (21\%) is accounted for by the effort and participation variables combined, while another

\textsuperscript{13} These additions are subject to the same issue of endogeneity discussed above; in particular, individuals who in their past employment had a higher well-being (which could persist into the present) might be less likely to change jobs. We therefore look only for associations, not proof of causation.
equal proportion is down to workplace change. Overall, the model accounts for 37% of the decline, and the rest can only be put down to unobserved variables. By contrast, in the case of females the Enthusiasm index, which barely changed, would have declined considerably if the only factors were rising insecurity and workplace changes; however, most of this is counterbalanced by a rise in skills challenge for women (principally, a rise in the opportunity to use their skills).

With the Contentment index, nearly a fifth (19%) of the 0.219 decline for males is accounted for by changing effort and participation. This share is added to by workplace change and insecurity, but partly counterbalanced by an improvement in skills challenge. As a result, overall nearly a quarter (24%) of the decline is accounted for. For females, nearly a quarter (24%) of the smaller decline of 0.115 is accounted by effort and participation; workplace change and insecurity together add a similar amount; however, again skills challenge provides a substantial counterbalance. Overall, 37% of the fall is accounted for.

Thus overall, while some of the declines in well-being are accounted for by observed workplace change and changing job quality, only a minority share is 'explained' in this way. The 'unexplained' parts of the declines can be attributable to unobserved variables with predicted high influence on well-being, about which one can speculate. One possibility is the wider forms of insecurity (fear of unfair treatment and unwanted role alteration) which are known to have risen substantially between 2000 and 2012 (Gallie et al., 2013). Another is pay cuts: with median real wages falling since 2008, there will have been a substantial rise between 2006 and 2012 in the number of employees experiencing reductions.

**Conclusion.**

In this paper, we have applied several core theories of job-related well-being to a large nationally-representative sample of Britain's workers. Modelling the determination of two dimensions of job-related well-being, we confirmed some findings from earlier research using non-nationally-representative data, namely:
• Effort/job demands have more (negative) association with Contentment than with Enthusiasm (H1 and H3)).
• Individual job control (task discretion) has a large positive association with job-related well-being; this link interacts with effort/job demands, as predicted, so that individual job control is more effective at higher levels of effort (H4 and H5).
• Decision-making organisational participation is associated with higher well-being (H6), the main channels being through having an influence on changes in work methods, and through the influence obtained in semi-autonomous teams
• Job insecurity is associated with lower well-being (H11)

Our first substantive new finding is that there was a substantial fall in job-related well-being over the 2006-2012 period surrounding the Great Recession, while over the same period there were some significant changes in job quality (increases in effort, insecurity and the pace of workplace change). For males, both Enthusiasm and Contentment fell, while for females only Contentment fell. We found from the model that there is only weak evidence that the marginal effect of effort/job demands on well-being is increasingly negative (H2). Practices that connect organisational performance with rewards are linked with lower Contentment for males (H8). However, receipt of other forms of performance-related pay has no significant association with job-related well-being. Job variety and opportunities for skills use have more of a positive association with Enthusiasm than on Contentment (H9 and H10). Moreover, we find that some indicators of challenge (learning requirements, non-repetitiveness of tasks) are associated with higher levels of Enthusiasm but lower levels of Contentment (H9 and H10). Finally, we found that downsizing, work re-organisation and decreased choice are each associated directly with lower job-related well-being (H12).

In the absence of nationally-representative panel data with equally rich job quality data where one could eliminate biases associated with remaining unobserved person-fixed effects, the contribution of these findings is: first, that they show consistency with core theories; second, that they point to some differential effects on the two dimensions of job-related well-being, with some characteristics such as skills challenge more related to emotional arousal than to
pleasure, hence more to Enthusiasm than to Contentment, while others such as work intensity impinge negatively on pleasure and hence more strongly on Contentment than on Enthusiasm. These more nuanced findings offer the prospect of developing a better understanding of what makes for a good workplace.

The step we have taken in this paper to reduce potential endogeneity biases is to include a wide array of control variables. Our most notable innovation, in this respect, is that in the latest wave we have included controls for personality traits, the 'Big Five' measured in short form, since it could be held that these would influence the allocation to jobs as well as being strongly correlated with subjective well-being. Reassuringly, the estimated associations of our baseline model variables with well-being were showed no or only small changes, when family background and personality controls were introduced. Nevertheless, given that there are likely to be other unobserved person-specific factors affecting the allocation of labour none of the estimates can be regarded as unbiased estimates of causal effects. The next step for further research should be to test these hypotheses with nationally representative panel data.

The estimates accounted for a minority part of the decline between 2006 and 2012 in both dimensions of well-being. The variables that were driving this ‘explained’ decline were those typically associated with recession: downsizing of establishment size, rising job insecurity and work intensification not accompanied by rising discretion or decision-making participation. The opportunity to utilise skills increased and improved well-being slightly, and this appears to have contributed a little to the observed gender difference in declining well-being. Nevertheless, there remains a substantial part of the decline that is ‘unexplained’, which has to be put down to unobserved factors.

Economic downturns are to be avoided if possible through macroeconomic management, and the effects of rising insecurity and accelerated disruptive workplace change on job-related well-being provide yet more reasons to do so. But if downturns occur it may be suggested that the control of work intensity and a better design of jobs could ameliorate some of the detrimental effects on well-being. The estimates, if taken at face value as deriving from causal effects, point to the need for more individual or team-level job control (task discretion), greater
variety, more efficient use of skills, and a say in matters of work organisation. Organisational participation at a higher level, for example through better communication or a union voice, is found to be valuable though of lesser import. By contrast, attempts to foster better performance through broadening the use of economic incentives would appear, on this evidence, to be neutral when applied at individual or team levels, but at organisational level to come at a small cost of lower well-being.

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Table 1  Job-Related Well-Being in 2001, 2006 and 2012

|                          | 2001 | 2006 | 2012 | sd  | change | change |
|--------------------------|------|------|------|-----|--------|--------|
| Enthusiasm               | 4.29 | 4.27 | 4.22 | 0.83| -0.02  | -0.06***|
| Contentment              | 3.76 | 3.75 | 3.58 | 0.89| 0.00   | -0.18***|
| Enthusiasm (positive items) | 3.35 | 3.31 | 3.32 | 0.89| -0.04  | 0.01   |
| Contentment (positive items) | 2.85 | 2.84 | 2.73 | 1.13| -0.01  | -0.11***|
| Enthusiasm (negative items) | 5.23 | 5.23 | 5.12 | 0.88| 0.00   | -0.12***|
| Contentment (negative items) | 4.67 | 4.67 | 4.42 | 0.95| 0.00   | -0.24***|
| Enthusiasm (males)       | 4.25 | 4.24 | 4.12 | 0.83| 0.00   | -0.12***|
| Contentment (males)      | 3.78 | 3.80 | 3.56 | 0.88| 0.02   | -0.24***|
| Enthusiasm (females)     | 4.34 | 4.30 | 4.32 | 0.82| -0.03  | 0.01   |
| Contentment (females)    | 3.74 | 3.71 | 3.59 | 0.89| -0.03  | -0.11***|

Employees Aged 20-60.
Table 2 Job Characteristics.

| DOMAIN                  | INDICATORS                          | 2001 Mean | 2006 Mean | 2012 Mean | Pooled sd | Change 01-06 | Change 06-12 |
|-------------------------|-------------------------------------|-----------|-----------|-----------|-----------|--------------|--------------|
| Effort/ job demands     | Effort index                        | -0.042    | -0.015    | 0.050     | 0.634     | 0.027**      | 0.065***     |
|                         | Hours per week                      | 37.217    | 36.704    | 36.205    | 12.498    | -0.513*      | -0.499*      |
| Participation           | Task Discretion Index               | 2.183     | 2.18      | 2.184     | 0.657     | -0.003       | 0.004        |
|                         | Semi-autonomous Team                | 0.144     | 0.143     | 0.178     | 0.357     | -0.001       | 0.035***     |
|                         | Influence on change in work method  | 0.357     | 0.313     | 0.263     | 0.465     | -0.044***    | -0.050**     |
|                         | Quality circle participation        | 0.370     | 0.424     | 0.394     | 0.49      | 0.054        | -0.030**     |
|                         | Organisational Communications Index | 3.646     | 4.217     | 4.194     | 2.833     | 0.571***     | -0.023       |
|                         | Union Voice                         | 0.196     | 0.194     | 0.181     | 0.394     | -0.002       | -0.013       |
|                         | Individual PRP                      | 0.256     | 0.291     | 0.280     | 0.448     | 0.035***     | -0.011       |
|                         | Team PRP                            | 0.152     | 0.159     | 0.179     | 0.367     | 0.007        | 0.020**      |
|                         | Organisation PRP                    | 0.330     | 0.307     | 0.293     | 0.463     | -0.023**     | -0.014       |
| Skills Challenge        | Learning                            | 0.811     | 0.823     | 0.823     | 0.385     | 0.012        | 0.000        |
|                         | Variety (Ref. Some, little or none) | 0.325     | 0.34      | 0.337     | 0.472     | 0.015        | -0.003       |
|                         | ‘Quite a lot’                       | 0.334     | 0.309     | 0.305     | 0.465     | -0.025***    | -0.004       |
|                         | ‘Great deal’                        |           |           |           |           |              |              |
|                         | Non-repetitive tasks                | 0.244     | 0.234     | 0.199     | 0.421     | -0.010       | -0.035***    |
|                                      | Agree   | 0.484 | 0.433 | 0.446 | 0.498 | -0.051*** | 0.013   |
|--------------------------------------|---------|-------|-------|-------|-------|-----------|---------|
|                                      | Disagree| 0.146 | 0.122 | 0.100 | 0.331 | -0.024*** | -0.022***|
|                                      | Strongly disagree | 0.040 | 0.045 | 0.031 | 0.197 | 0.005     | -0.014***|
| **Job insecurity**                   |         |       |       |       |       |           |         |
| Job insecurity (chance of job loss): (Ref. no chance or very unlikely) |         |       |       |       |       |           |         |
| Quite unlikely/evens                | 0.095   | 0.116 | 0.158 | 0.323 | 0.021*** | 0.042*** |
| Quite likely/very likely            | 0.062   | 0.058 | 0.066 | 0.239 | -0.004 | 0.008    |
| **Workplace change**                |         |       |       |       |       |           |         |
| + Skill increase \( ^{DV} \)       | 0.599   | 0.576 | 0.539 | 0.494 | -0.023** | -0.037***|
| + Promoted \( ^{DV} \)              | .       | 0.379 | 0.354 | 0.483 | .       | -0.025** |
| + Increased choice over way job done \( ^{DV} \) | .       | 0.414 | 0.363 | 0.490 | .       | -0.051***|
| + Decreased choice over way job done \( ^{DV} \) | .       | 0.117 | 0.153 | 0.334 | .       | 0.036*** |
| + Changed employer \( ^{DV} \)      | .       | 0.430 | 0.393 | 0.473 | .       | -0.037***|
| ++ Introduction of new technology \( ^{DV} \) | 0.616   | 0.632 | 0.579 | 0.487 | 0.016   | -0.053***|
| ++ Change in work organisation \( ^{DV} \) | 0.489   | 0.535 | 0.553 | 0.499 | 0.046*** | 0.018   |
| ++ Downsizing \( ^{DV} \)           | 0.286   | 0.300 | 0.408 | 0.466 | 0.014   | 0.108*** |

i. Employees Aged 20-60.
ii. DV: 0-1 dummy variable. All variables are defined in Section .. of text.
iii. Changes significantly different from zero at levels: *** p<0.01, ** p<0.05, * p<0.1
iv. + Applies to those in employment at a past reference point; ++ applies to those who remained in the same job since the reference point. (The reference point is 5 yrs previously or, if not in employment then, 4 years previously or, if not in employment then, 3 years previously.)
|                      | Males (1) Enthusiasm | Males (2) Contentment | Females (3) Enthusiasm | Females (4) Contentment |
|----------------------|----------------------|-----------------------|------------------------|------------------------|
| Effort               | -0.348***            | -0.542***             | -0.329***              | -0.763***              |
|                      | (0.0679)             | (0.0752)              | (0.0628)               | (0.0669)               |
| Effort squared       | -0.0351              | -0.0307               | -0.0381                | -0.0742***             |
|                      | (0.0252)             | (0.0279)              | (0.0236)               | (0.0251)               |
| Hours per week       | -0.0137***           | -0.00726              | -0.0203***             | -0.0112***             |
|                      | (0.00439)            | (0.00487)             | (0.00359)              | (0.00382)              |
| Hours squared        | 0.000169***          | 6.10e-05              | 0.000191***            | -1.61e-05              |
|                      | (5.09e-05)           | (5.64e-05)            | (5.41e-05)             | (5.77e-05)             |
| Task Discretion      | 0.0995***            | 0.105***              | 0.106***               | 0.101***               |
|                      | (0.0209)             | (0.0232)              | (0.0192)               | (0.0204)               |
| Effort times task discretion | 0.110***          | 0.0402                | 0.0941***              | 0.131***               |
|                      | (0.0289)             | (0.0321)              | (0.0271)               | (0.0289)               |
| Semi-auton. Team     | 0.0806**             | 0.103***              | 0.0140                 | 0.0981***              |
|                      | (0.0330)             | (0.0366)              | (0.0330)               | (0.0351)               |
| Influence on change in work method | 0.266***          | 0.240***              | 0.257***               | 0.258***               |
|                      | (0.0278)             | (0.0308)              | (0.0268)               | (0.0285)               |
| Quality circle participation | 0.0445*             | 0.0258                | 0.0184                 | -0.0104                |
|                      | (0.0261)             | (0.0289)              | (0.0254)               | (0.0271)               |
| Organisational Communications | 0.0177***         | 0.00750               | 0.0194***              | 0.00538                |
|                      | (0.00469)            | (0.00520)             | (0.00479)              | (0.00510)              |
| Union Voice          | 0.0129               | 0.0877**              | -0.00708               | -0.00662               |
|                      | (0.0315)             | (0.0349)              | (0.0288)               | (0.0307)               |
| Individual PRP       | -0.0226              | -0.0215               | -0.0112                | 0.0233                 |
|                      | (0.0300)             | (0.0333)              | (0.0330)               | (0.0352)               |
| Team PRP             | 0.0313               | 0.0423                | -0.0507                | -0.0264                |
|                      | (0.0359)             | (0.0397)              | (0.0424)               | (0.0452)               |
| Organisation PRP     | -0.000112            | -0.0663***            | -0.0405                | -0.00290               |
|                      | (0.0302)             | (0.0335)              | (0.0323)               | (0.0344)               |
| Learning             | 0.0392               | -0.114***             | 0.0701**               | -0.0181                |
|                      | (0.0352)             | (0.0390)              | (0.0337)               | (0.0359)               |
| Variety (Ref. Some, little or none) |                      |                       |                        |                        |
| ‘Quite a lot’        | 0.138***             | 0.0482                | 0.234***               | 0.128***               |
|                      | (0.0316)             | (0.0350)              | (0.0296)               | (0.0316)               |
| ‘Great deal’         | 0.347***             | 0.200***              | 0.372***               | 0.151***               |
|                      | (0.0344)             | (0.0381)              | (0.0345)               | (0.0367)               |
| Non-repetitive tasks | 0.0576**             | -0.0907***            | -0.0420                | -0.0832***             |
|                      | (0.0286)             | (0.0317)              | (0.0295)               | (0.0315)               |
| Enough opportunity for skill use? (Ref. Strongly agree) |                      |                       |                        |                        |
| Agree                | -0.123***            | -0.138***             | -0.115***              | -0.0763***             |
|                      | Disagree       | (0.0271) | (0.0301) | (0.0262) | (0.0280) |
|----------------------|----------------|----------|----------|----------|----------|
|                      | Strongly disagree | -0.254*** | -0.277*** | -0.439*** | -0.331*** |
|                      |                | (0.0424) | (0.0470) | (0.0400) | (0.0426) |
| Job insecurity (chance of job loss): | Strongly disagree | -0.396*** | -0.290*** | -0.382*** | -0.231*** |
|                      |                | (0.0664) | (0.0735) | (0.0628) | (0.0669) |
| (Ref. no chance or very unlikely) | Quite unlikely/evens | -0.204*** | -0.317*** | -0.0851** | -0.203*** |
|                      |                | (0.0335) | (0.0371) | (0.0381) | (0.0406) |
|                      | Quite likely/very likely | -0.418*** | -0.289*** | -0.348*** | -0.313*** |
|                      |                | (0.0493) | (0.0547) | (0.0498) | (0.0530) |
| Observations         | 3,853          | 3,853    | 4,285    | 4,285    |
| R²                   | 0.198          | 0.151    | 0.184    | 0.204    |
| chi sq (independence of error terms) | 1549          | 1549    | 1646    | 1646    |

i. SURE estimates are presented, with standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

ii. Pooled data from 2006 and 2012 employees aged 20 to 65.
Table 4 The Association of Workplace Changes with Job-Related Well-Being.

| VARIABLES                        | Males (1) | Females (2) | Males (3) | Females (4) |
|----------------------------------|-----------|-------------|-----------|-------------|
|                                  | Enthusiasm| Contentment| Enthusiasm| Contentment |
| Skill increase                   | 0.0391    | 0.00562     | 0.00437   | -0.0413     |
|                                  | (0.0268)  | (0.0296)    | (0.0273)  | (0.0293)    |
| Promotion                        | 0.0727*** | -0.0282     | -0.0292   | -0.0738**   |
|                                  | (0.0272)  | (0.0300)    | (0.0268)  | (0.0288)    |
| Increased choice                 | -0.00232  | 0.0397      | 0.0771*** | 0.0402      |
|                                  | (0.0291)  | (0.0322)    | (0.0286)  | (0.0307)    |
| Decreased choice                 | -0.136*** | -0.170***   | -0.176*** | -0.171***   |
|                                  | (0.0400)  | (0.0442)    | (0.0403)  | (0.0432)    |
| Changed employer                 | -0.0371   | -0.118***   | 0.0280    | -0.103**    |
|                                  | (0.0392)  | (0.0433)    | (0.0376)  | (0.0403)    |
| Introduction of new technology   | -0.0476   | -0.0708*    | 0.0481    | -0.0233     |
|                                  | (0.0354)  | (0.0391)    | (0.0341)  | (0.0365)    |
| Change in Work Org.              | -0.0674*  | -0.114***   | -0.0801** | -0.0715**   |
|                                  | (0.0349)  | (0.0385)    | (0.0330)  | (0.0354)    |
| Downsizing                       | -0.137*** | -0.0913**   | -0.175*** | -0.173***   |
|                                  | (0.0329)  | (0.0363)    | (0.0331)  | (0.0355)    |
| CONTROLS                         | YES       | YES         | YES       | YES         |
| Observations                     | 3,825     | 3,825       | 4,227     | 4,227       |
| R²                               | 0.211     | 0.166       | 0.203     | 0.215       |

i. SURE estimates are presented, with standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

ii. Pooled data from 2006 and 2012 employees aged 20 to 65.

iii. Controls include all variables included in Table 3, plus a dummy for whether employed at the past reference point (see note (iv) to Table 2).
Table 5. Decomposition Analysis of the Fall in Job-Related Well-Being

|                        | Males          | Females         |
|------------------------|----------------|-----------------|
|                        | Enthusiasm     | Contentment     | Enthusiasm | Contentment     |
| Fall, 2006-2012        | 0.108 ***      | 0.219 ***       | -0.012     | 0.115 ***       |
| ‘Explained’ by (%) of fall: |                |                 |            |                 |
| Effort & Participation | 21.3 ***       | 18.9 ***        | 79.9       | 24.0 **         |
| Skills Challenge       | -11.1          | -6.9 ***        | -167.2 **  | -11.9 ***       |
| Insecurity             | 5.5            | 4.5 **          | 71.2 **    | 11.8 ***        |
| Workplace change       | 21.2 ***       | 7.9 ***         | 185.0 ***  | 12.9 ***        |
| Total                  | 37.0 ***       | 24.4 ***        | 180.7      | 36.8 ***        |

The asterisks indicate whether the changes and ‘explained’ changes differ significantly from zero: *** p<0.01, ** p<0.05, * p<0.1. ‘Explained’ differences are those associated with between-year differences in the explanatory variables (those used in Table 4).
### Appendix. Table A1m Males

| VARIABLES                       | (1) Enthusiasm | (2) Contentment | (3) Enthusiasm | (4) Contentment | (5) Enthusiasm | (6) Contentment |
|---------------------------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
| Effort                          | -0.329***      | -0.348***       | -0.335***      | -0.361***       | -0.343***      | -0.367***       |
|                                 | (0.126)        | (0.129)         | (0.120)        | (0.123)         | (0.119)        | (0.121)         |
| Effort squared                  | -0.117**       | -0.0394         | -0.110**       | -0.0346         | -0.121***      | -0.0433         |
|                                 | (0.0498)       | (0.0507)        | (0.0469)       | (0.0483)        | (0.0468)       | (0.0476)        |
| Hours per week                  | -0.0139        | -0.00899        | -0.00995       | -0.00517        | -0.0114        | -0.00555        |
|                                 | (0.00920)      | (0.00937)       | (0.00868)      | (0.00893)       | (0.00867)      | (0.00881)       |
| Hours squared                   | 0.000188*      | 0.000128        | 0.000136       | 7.86e-05        | 0.000147       | 8.29e-05        |
|                                 | (0.000110)     | (0.000112)      | (0.000104)     | (0.000107)      | (0.000103)     | (0.000105)      |
| Task Discretion                 | 0.1000**       | 0.0826**        | 0.0985***      | 0.0779**        | 0.101***       | 0.0905**        |
|                                 | (0.0393)       | (0.0400)        | (0.0373)       | (0.0384)        | (0.0373)       | (0.0380)        |
| Effort times task discretion    | 0.0992*        | -0.0629         | 0.101*         | -0.0596         | 0.105**        | -0.0511         |
|                                 | (0.0558)       | (0.0568)        | (0.0527)       | (0.0542)        | (0.0527)       | (0.0536)        |
| Semi-auton. Team                | 0.0529         | 0.0818          | 0.0876         | 0.119**         | 0.102*         | 0.137**         |
|                                 | (0.0578)       | (0.0589)        | (0.0548)       | (0.0564)        | (0.0554)       | (0.0563)        |
| Infl. on change in work method  | 0.285***       | 0.221***        | 0.226***       | 0.170***        | 0.221***       | 0.170***        |
|                                 | (0.0551)       | (0.0561)        | (0.0522)       | (0.0537)        | (0.0522)       | (0.0531)        |
| Quality circle participation    | 0.0563         | 0.0314          | 0.0195         | 0.00443         | 0.0125         | 0.0208          |
|                                 | (0.0496)       | (0.0505)        | (0.0471)       | (0.0484)        | (0.0474)       | (0.0482)        |
| Organisational Communications   | 0.0212**       | 0.0153          | 0.0216**       | 0.0150*         | 0.0207**       | 0.0147          |
|                                 | (0.00933)      | (0.00950)       | (0.00879)      | (0.00905)       | (0.00882)      | (0.00897)       |
| Union Voice                     | 0.0610         | 0.136**         | 0.0532         | 0.134**         | 0.0539         | 0.142**         |
|                                 | (0.0612)       | (0.0623)        | (0.0577)       | (0.0593)        | (0.0576)       | (0.0586)        |
| Individual PRP                  | -0.0961        | 0.0517          | -0.112**       | 0.0384          | -0.108*        | 0.0407          |
|                                 | (0.0599)       | (0.0610)        | (0.0565)       | (0.0581)        | (0.0564)       | (0.0573)        |
| Team PRP                        | 0.102          | 0.0135          | 0.0732         | -0.00744        | 0.0751         | -0.0119         |
|                                 | (0.0685)       | (0.0697)        | (0.0646)       | (0.0665)        | (0.0646)       | (0.0656)        |
| Organisation PRP                | 0.0169         | -0.0929         | 0.0440         | -0.0709         | 0.0411         | -0.0536         |
|                                 | (0.0603)       | (0.0614)        | (0.0569)       | (0.0585)        | (0.0568)       | (0.0578)        |
| Learning                        | 0.0497         | -0.110          | 0.0798         | -0.0849         | 0.0783         | -0.0674         |
|                                 | (0.0671)       | (0.0683)        | (0.0632)       | (0.0651)        | (0.0632)       | (0.0643)        |
| Variety (Ref. Some, little or none) | 'Quite a lot' | 'Great deal' | Non-repetitive tasks | Enough opportunity for skill use? (Ref. Strongly agree) | Job insecurity (chance of job loss): (Ref. no chance or very unlikely) | Other Controls |
|-----------------------------------|----------------|--------------|------------------------|-------------------------------------------------------|-------------------------------------------------------------------|----------------|
|                                  |                |              |                        | Agree                                                  | Disagree                                                          |                |
|                                  |                |              |                        |            -0.150***  -0.182***  -0.0961**  -0.133**  -0.0963**  -0.135**  |                |
|                                  |                |              |                        |            (0.0512)  (0.0521)  (0.0483)  (0.0498)  (0.0482)  (0.0491) |                |
|                                  |                |              |                        | Disagree                                             | -0.322***  -0.342***  -0.303***  -0.322***  -0.306***  -0.295**  |                |
|                                  |                |              |                        |            (0.0851)  (0.0866)  (0.0805)  (0.0828)  (0.0805)  (0.0819) |                |
|                                  |                |              |                        | Strongly disagree                                    | -0.693***  -0.625***  -0.723***  -0.658***  -0.709***  -0.640***  |                |
|                                  |                |              |                        |            (0.154)  (0.157)  (0.146)  (0.150)  (0.146)  (0.149) |                |
|                                  |                |              |                        |                                              |                                              |                |
|                                  |                |              |                        | Agree                                                  | Disagree                                                          |                |
|                                  |                |              |                        |            -0.210***  -0.202***  -0.169***  -0.164***  -0.169***  -0.128**  |                |
|                                  |                |              |                        |            (0.0603)  (0.0614)  (0.0570)  (0.0587)  (0.0573)  (0.0583) |                |
|                                  |                |              |                        | Disagree                                             | -0.491***  -0.357***  -0.406***  -0.277***  -0.411***  -0.290***  |                |
|                                  |                |              |                        |            (0.0951)  (0.0968)  (0.0902)  (0.0928)  (0.0904)  (0.0919) |                |
|                                  |                |              |                        |                                              |                                              |                |
| Extrapversion                    |                |              |                        | Extraversion                                         | Agreeableness                                                    |                |
|                                  |                |              |                        |            0.122***  0.0659*  0.132***  0.0638  | 0.103**  0.0816*  0.103**  0.0709  |                |
|                                  |                |              |                        |            (0.0382)  (0.0393)  (0.0384)  (0.0391) | (0.0448)  (0.0461)  (0.0447)  (0.0455) |                |
| Agreeableness                    |                |              |                        | Conscientiousness                                   | Emotional Stability                                               |                |
|                                  |                |              |                        |            0.0792*  0.111**  0.0666  0.115**  | 0.349***  0.323***  0.358***  0.331***  |                |
|                                  |                |              |                        |            (0.0458)  (0.0471)  (0.0463)  (0.0471) | (0.0427)  (0.0439)  (0.0426)  (0.0433) |                |
| Conscientiousness                |                |              |                        | Openness                                             | Other Controls                                                   |                |
|                                  |                |              |                        |            0.0557  0.0679  0.0492  0.0763  | NO  NO  YES  YES  |                |
| Emotional Stability              |                |              |                        |                                              |                                              |                |
| Openness                         |                |              |                        |                                              |                                              |                |
| Other Controls                   |                |              |                        |                                              |                                              |                |
| Observations | 1,062 | 1,062 | 1,062 | 1,062 | 1,062 | 1,062 |
|--------------|-------|-------|-------|-------|-------|-------|
| R-squared    | 0.274 | 0.203 | 0.358 | 0.280 | 0.366 | 0.305 |
| chi2_bp      | 423.5 | 423.5 | 369.0 | 369.0 | 372.4 | 372.4 |

i. SURE estimates are presented, with standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

ii. SES 2012 data for employees aged 20 to 65.

iii. Other controls include: age, ethnicity, education level, childhood financial security and parental interest.
### Table A1f Females.

| VARIABLES                        | (1)      | (2)      | (3)      | (4)      | (5)      | (6)      |
|----------------------------------|----------|----------|----------|----------|----------|----------|
| Enthusiasm                       | -0.247** | -0.802***| -0.288***| -0.828***| -0.269** | -0.758***|
|                                  | (0.115)  | (0.122)  | (0.110)  | (0.118)  | (0.111)  | (0.118)  |
| Contentment                      | -0.0236  | 0.0313   | -0.0242  | -0.0218  | -0.0232  | -0.0214  |
|                                  | (0.0460) | (0.0486) | (0.0443) | (0.0475) | (0.0443) | (0.0472) |
| Effort                           | 0.000201** | -2.87e-06 | 0.000169* | -2.72e-05 | 0.000177** | -1.21e-05|
|                                  | (9.27e-05) | (9.80e-05) | (8.86e-05) | (9.50e-05) | (8.90e-05) | (9.48e-05) |
| Hours per week                   | -0.00190 | 0.131*** | 0.0772** | 0.100*** | 0.0773** | 0.0919***|
|                                  | (0.0339) | (0.0358) | (0.0327) | (0.0350) | (0.0327) | (0.0348) |
| Effort times task discretion     | 0.0712   | 0.151*** | 0.0668   | 0.145*** | 0.0643   | 0.129**  |
|                                  | (0.0496) | (0.0525) | (0.0474) | (0.0509) | (0.0476) | (0.0507) |
| Semi-auton. Team                 | -0.0236*** | 0.185*** | 0.0241   | 0.208*** | 0.00517  | 0.183*** |
|                                  | (0.0566) | (0.0598) | (0.0542) | (0.0582) | (0.0544) | (0.0579) |
| Infl. on change in work method   | 0.279*** | 0.325*** | 0.241*** | 0.290*** | 0.244*** | 0.269*** |
|                                  | (0.0490) | (0.0518) | (0.0469) | (0.0503) | (0.0471) | (0.0502) |
| Quality circle participation     | 0.0313   | 0.0230   | -0.000981| -0.000783| 0.00628  | 0.0184   |
|                                  | (0.0445) | (0.0470) | (0.0426) | (0.0457) | (0.0425) | (0.0453) |
| Organisational Communications    | 0.0138   | -0.00263 | 0.0175** | 0.00145  | 0.0169** | 0.00403  |
|                                  | (0.00858) | (0.00907) | (0.00821) | (0.00881) | (0.00824) | (0.00878) |
| Union Voice                      | -0.0871* | -0.0570  | -0.0436  | -0.0135  | -0.0445  | -0.0138  |
|                                  | (0.0510) | (0.0539) | (0.0491) | (0.0526) | (0.0491) | (0.0523) |
| Individual PRP                   | 0.0138   | 0.0865   | -0.00591 | 0.0708   | -0.0112  | 0.0671   |
|                                  | (0.0609) | (0.0643) | (0.0581) | (0.0624) | (0.0584) | (0.0622) |
| Team PRP                         | -0.0997  | -0.0596  | -0.0850  | -0.0477  | -0.0827  | -0.0420  |
|                                  | (0.0748) | (0.0791) | (0.0715) | (0.0767) | (0.0711) | (0.0758) |
| Organisation PRP                 | -0.0248  | -0.0107  | -0.0370  | -0.0218  | -0.0501  | -0.0520  |
|                                  | (0.0608) | (0.0643) | (0.0581) | (0.0623) | (0.0580) | (0.0618) |
| Learning                         | 0.164*** | 0.0462   | 0.146**  | 0.0329   | 0.132**  | 0.0130   |
|                                  | (0.0612) | (0.0647) | (0.0585) | (0.0627) | (0.0588) | (0.0627) |
| Variety (Ref. Some, little or none) | 0.161*** | 0.106* | 0.147*** | 0.0909* | 0.155*** | 0.112** |
|-----------------------------------|----------|--------|-----------|---------|-----------|---------|
| ‘Quite a lot’                     | (0.0521) | (0.0550) | (0.0497) | (0.0533) | (0.0501) | (0.0534) |
| ‘Great deal’                      | 0.429*** | 0.230*** | 0.364*** | 0.174*** | 0.374*** | 0.193*** |
| (0.0594)                          | (0.0628) | (0.0571) | (0.0612) | (0.0573) | (0.0610) |
| Non-repetitive tasks              | -0.128** | -0.242*** | -0.119** | -0.238*** | -0.105** | -0.193*** |
| (0.0540)                          | (0.0571) | (0.0516) | (0.0554) | (0.0521) | (0.0555) |

| Enough opportunity for skill use? | -0.113** | -0.00676 | -0.0870** | 0.0147 | -0.0932** | -0.0173 |
| (Ref. Strongly agree)             | (0.0455) | (0.0481) | (0.0436) | (0.0467) | (0.0438) | (0.0467) |
| Agree                             | -0.599*** | -0.466*** | -0.584*** | -0.454*** | -0.589*** | -0.474*** |
| (0.0779)                          | (0.0823) | (0.0744) | (0.0798) | (0.0742) | (0.0790) |
| Disagree                          | -0.615*** | -0.255** | -0.668*** | -0.307** | -0.664*** | -0.294** |
| (0.117)                           | (0.124) | (0.112) | (0.120) | (0.112) | (0.119) |

| Job insecurity (chance of job loss): | -0.0454 | -0.161** | -0.00510 | -0.124** | 0.00639 | -0.103* |
| (Ref. no chance or very unlikely)   | (0.0599) | (0.0633) | (0.0573) | (0.0615) | (0.0572) | (0.0610) |
| Quite unlikely/evens               | -0.315*** | -0.269*** | -0.301*** | -0.255*** | -0.291*** | -0.257*** |
| (0.0826)                           | (0.0873) | (0.0790) | (0.0848) | (0.0793) | (0.0844) |
| Quite likely/very likely           | 0.141*** | 0.0929*** | 0.137*** | 0.0895** | 0.0335 | 0.0359 |
| (Extraversion)                     | (0.0335) | (0.0359) | (0.0335) | (0.0357) | (0.0357) |
| Agreeableness                      | 0.0535 | -0.000904 | 0.0591 | -0.0168 | 0.0434 | 0.0466 |
| (Agreeableness)                    | (0.0434) | (0.0466) | (0.0436) | (0.0464) | (0.0464) |
| Conscientiousness                  | 0.0941** | 0.108** | 0.0931** | 0.112** | (0.0442) | (0.0474) |
| (Conscientiousness)                | (0.0442) | (0.0474) | (0.0440) | (0.0469) | (0.0469) |
| Emotional Stability                | 0.238*** | 0.250*** | 0.227*** | 0.231*** | (0.0399) | (0.0428) |
| (Emotional Stability)              | (0.0399) | (0.0428) | (0.0398) | (0.0424) | (0.0424) |
| Openness                           | 0.149*** | 0.107** | 0.143*** | 0.123*** | (0.0426) | (0.0457) |
| (Openness)                         | (0.0426) | (0.0457) | (0.0431) | (0.0459) | (0.0459) |

| Other Controls                     | NO       | NO       | NO       | NO       | YES      | YES     |
| Observations | 1,314 | 1,314 | 1,314 | 1,314 | 1,314 | 1,314 |
|--------------|-------|-------|-------|-------|-------|-------|
| R-squared    | 0.217 | 0.239 | 0.289 | 0.287 | 0.297 | 0.306 |
| chi2_bp      | 541.5 | 541.5 | 496.2 | 496.2 | 499.2 | 499.2 |

i. SURE estimates are presented, with standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
ii. SES 2012 data for employees aged 20 to 65.
iii. Other controls include: age, ethnicity, education level, childhood financial security and parental interest.