DISCUSSION PAPER SERIES

IZA DP No. 9096

Does Worker Wellbeing Affect Workplace Performance?

Alex Bryson
John Forth
Lucy Stokes

June 2015

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

Does Worker Wellbeing Affect Workplace Performance?

Alex Bryson
NIESR, CEP and IZA

John Forth
NIESR

Lucy Stokes
NIESR

Discussion Paper No. 9096
June 2015

IZA

P.O. Box 7240
53072 Bonn
Germany

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

IZA Discussion Paper No. 9096
June 2015

ABSTRACT

Does Worker Wellbeing Affect Workplace Performance?*

This paper uses linked employer-employee data to investigate the relationship between employees' subjective well-being and workplace performance in Britain. The analyses show a clear, positive and statistically-significant relationship between the average level of job satisfaction at the workplace and workplace performance. This finding is present in both cross-sectional and panel analyses and is robust to various estimation methods and model specifications. In contrast, we find no association between levels of job-related affect and workplace performance.

JEL Classification: J28

Keywords: subjective wellbeing, job satisfaction, job-related affect, workplace performance

Corresponding author:

John Forth
National Institute of Economic and Social Research
2 Dean Trench Street
London, SW1P 3HE
United Kingdom
E-mail: j.forth@niesr.ac.uk

* This work is funded by the UK's Department of Business Innovation and Skills. We thank participants at the 18th Colloquium in Personnel Economics in Vienna for comments. The authors acknowledge the Department of Business Innovation and Skills, the Economic and Social Research Council, the Advisory, Conciliation and Arbitration Service and the National Institute of Economic and Social Research as the originators of the 2011 Workplace Employee Relations Survey data, and the Data Archive at the University of Essex as the distributor of the data.

1. Introduction

Raising individuals' subjective well-being is increasingly viewed as an important target of public policy (see Layard, 2011; O'Donnell et. al., 2014; Stiglitz et. al., 2009). However there are reasons to think that improvements in employees' wellbeing may also be conducive to economic growth. This paper focuses on the the subjective wellbeing of employees and its potential impact on workplace performance.

Subjective wellbeing (SWB) has been defined to comprise "all of the various evaluations, positive and negative, that people make of their lives, and the affective reactions of people to their experiences" (OECD, 2013: 29). There is already a great deal of empirical evidence pointing to a positive causal effect of SWB on individuals' physical health (see Diener and Chan, 2011). There is also evidence to suggest that higher SWB can raise an individual's levels of creativity and problem-solving, and that it may also encourage pro-social behaviour and greater levels of engagement at work (see Lyubomirsky et al, 2005). Enhanced well-being thus has the potential to enable individuals to work harder or "smarter" and, indeed, a causal link between increased wellbeing and improved productivity has recently been established in laboratory experiments (Oswald et al., 2014).

If heightened subjective wellbeing can improve the performance of individual employees, it is then also conceivable that policies and practices that target improvements in subjective wellbeing may raise workplace performance and result in economic growth. Yet there is relatively little empirical evidence on the relationship between employees' subjective wellbeing and performance at the level of the workplace. One reason is that few nationally representative datasets contain measures of both worker wellbeing and workplace performance, as are necessary to test any association. This paper reports empirical analyses of a rich linked employer-employee survey in Britain which does contain such measures.

There is no certainty that higher subjective wellbeing for individual employees will translate into productivity or profitability at the level of the workplace or organisation. First, group dynamics come into play when considering relationships at a workplace or organisation-level that are not considered when focusing on individual effects. Second, many institutional and contextual factors may intervene, such that any improvements in performance dissipate. Third, one must also factor in the costs an employer may have incurred to bring about the improvement in wellbeing. We contribute to the literature by presenting the theoretical and conceptual arguments linking subjective wellbeing to workplace performance, and by contributing new evidence on the links between SWB and workplace performance.

Our data are the 2011 Workplace Employment Relations Survey (WERS) (Department for Business Innovation and Skills, 2013). These linked employer-employee data contain multiple

measures of employees' SWB and provide the basis for a robust investigation of the SWB-performance link in British workplaces. Using various multivariate regression techniques, we seek to isolate the independent relationship between SWB at the workplace and workplace performance.

We find a clear, positive and statistically-significant relationship between the average level of job satisfaction at the workplace and workplace performance. This finding is present in both cross-sectional and panel analyses and is robust to various estimation methods and model specifications. In contrast, we find no association between levels of job-related affect and workplace performance. Our finding on the link between job satisfaction and workplace performance finding is consistent with the results of a similar study for Finland by Bockerman and Ilmakunnas (2012).

The remainder of the paper proceeds as follows. Section 2 discusses the concept of SWB and reviews the evidence on: (i) the links between SWB and job performance at the level of an individual worker; and (ii) the links between SWB and performance at the level of the workplace. Section 3 outlines the nature of our data and measurements, and summarises our empirical strategy. Section 4 presents the results of our empirical analysis, before Section 5 concludes.

2. Concepts and existing evidence

2.1 The conceptualisation and measurement of SWB

There are two broad approaches to the conceptualisation and measurement of SWB (see OECD, 2013, for one discussion). Hedonic approaches focus on the *type of affective feelings* that a person experiences in their job (e.g. anxiety or contentment), and also on the *adequacy of those feelings* (e.g. whether the person is satisfied with certain aspects of their job). Ratings of job satisfaction can be particularly informative and have been shown to have an influence on employees' decision-making and behaviours – such as descisions about whether to search for an alternative job (see Green, 2010). In contrast to these hedonic approaches, the eudemonic approach to SWB focuses on the extent to which a person experiences feelings that are considered to *demonstrate good mental health*, e.g. the extent to which they feel a sense of purpose in their job. The differing approaches to the concept of SWB are illustrated side-by-side in Table 1.

[Table 1 here]

These various approaches are complementary to one another and research that seeks to measure SWB at a societal level has often attempted to incorporate all three dimensions (e.g. Tinkler and

Hicks, 2011). Our particular concern is with job-related SWB, however, and research in this area has tended to give most attention to measures of job satisfaction, with some attention given to direct measures of job-related affect, and least attention given to eudemonic aspects of SWB. This may partly be due to the conceptual proximity between job satisfaction and the economic notion of 'experienced utility', which makes ratings of job satisfaction particularly attractive to economists (see Dolan and Kahnemann, 2008; Stutzer and Frey, 2010). It may also be due to the greater difficulty that researchers have experienced in clearly specifying the nature of the underlying construct of eudemonic SWB and in separating it from relations concepts such as organizational commitment and job engagement (see Warr et al, 2013).

Notwithstanding these broader issues to do with the scope of the existing literature, there is a considerable amount of evidence to indicate that there is a positive correlation between SWB and an employee's job performance.

2.2 Evidence on the links between SWB and job performance at the level of the individual

Lyubmirsky et al's (2005) meta-analysis of 19 cross-sectional studies examined the relationship between positive affect and work-related outcomes, ranging from self-reported task performance and supervisor evaluations through to absenteeism and earnings, and found an average correlation coefficient of +0.20. Turning to measures of job satisfaction, a meta-analysis by Judge et al (2001) covered 254 studies – most of which were cross-sectional in nature – across which they found an average correlation of +0.30.

There is also some evidence to indicate that higher levels of SWB may have a causal impact on levels of job performance in some circumstances. Staw et al (1994) studied a sample of around 270 employees over a period of 18 months and found that those employees with higher levels of positive job-related affect at the outset were more likely to experience improvements in supervisory evaluations and in their earnings over the following 18 months, after controlling for a range of other personal characteristics. In a more recent study of 75 senior managers based on an experience sampling methodology, Zelenski et al (2008) found that positive job-related affect predicted self-reported productivity over the following two months. Neither of these studies achieve strict causal identification of an effect running from SWB to job performance, however a recent laboratory experiment by Oswald et al (2014) has provided evidence to support the notion that levels of SWB have a causal effect on work performance. Their study randomly induced improvements in SWB among groups of students who were undertaking a standardized mathematical test, in which the subjects were paid for each correct answer. In repeated measures, those students who experienced the greatest increase in SWB also registered the greatest improvement in test scores, suggesting a causal link between SWB and productivity, at least in their particular piece-rate setting.

Together the studies cited above provide substantial evidence that SWB and job performance are positively correlated, and some strong evidence that there can be a causal effect between the two, at least in certain circumstances. The empirical literature indicates three causal mechanisms through which this effect might come about.

The first is by affecting employees' cognitive abilities and processes - enabling them to think more creatively and to be more effective at problem-solving. The second is by affecting employees' attitudes to work - raising their propensity to be co-operative and collaborative. The third is by improving employees' physiology and general health - improving their cardiovascular health and immunity, enabling speedier recovery from illness, and securing greater levels of energy and potentially effort. The broad relationship is depicted in Figure 1.

[Figure 1 here]

In relation to the physiological effects, it has been shown that higher SWB leads to improved cardiovascular health, improved immunity and endocrine function, and speedier recovery from illness. Diener and Chan (2011) review a wide range of studies, including longitudinal general-population studies and controlled experiments, and conclude that there is compelling evidence that higher levels of SWB (measured in their studies by life satisfaction and affective feelings) have a causal effect on health and longevity. Some of these causal effects arise because levels of SWB directly affect physiological processes. SWB also has an indirect effect because individuals with higher SWB are more likely to engage in health-promoting behaviours and practices (Blanchflower et al, 2012; Grant et al, 2009). Such positive effects on physical health can be expected to afford a worker with greater levels of energy, which necessarily has the potential to raise the worker's effort (and thus their level of output). Improved health is also likely to reduce levels of involuntary absence from work and reduce the probability of quits due to ill-health.

In relation to cognitive processes, there are a number of experimental studies demonstrating that higher SWB is associated with increased levels of creativity and problem-solving (Isen et al, 1987, provide one review). Experimental research has also suggested that individuals with higher SWB process complex information more speedily (Oswald et al, 2014) and have a wider span of attention (Hockey, 1986; Fredrickson and Branigan, 2005). In these ways, higher SWB may improve the effective output of the worker by raising their level of task performance.

In relation to work attitudes, a number of studies have examined the relationship between SWB and 'extra-role' behaviours such as assisting colleagues and volunteering to undertake additional tasks, with a meta-analysis finding a strong positive correlation of +0.38 between measures of job satisfaction and so-called 'organizational citizenship behaviour' (Organ and Ryan, 1995). These work-related studies do not necessarily indicate a causal relationship of SWB on pro-social behaviour, although laboratory experiments conducted outside of a work context (e.g.

Isen, 1970; Cunningham, 1988) suggest that such a causal link may well exist in general. Other evidence comes in the form of studies which show a link between SWB and either absenteeism or quits. In meta-analyses, Farrell and Stamm (1988) and Hacket (1989) both found negative correlations of between 0.10 and 0.30 between absenteeism (whether measured in terms of frequency or days lost) and different measures of SWB (job satisfaction, anxiety-contentment and depression-enthusiasm). Clark's (2001) study of voluntary quits using the British Household Panel Survey showed, further, that low job satisfaction was found to be a significant predictor of voluntary turnover in the next year after controlling for demographic and occupational characteristics.

The preceding discussion suggests that the evidence positing a link between SWB and employee job performance is reasonably strong, containing a mix of general-population studies with some longitudinal evidence and also laboratory experiments which robustly identify causal effects. There are a number of issues which remain relatively under-developed however. One, in particular, is that the employee must also view it as *beneficial* to utilise any higher level of SWB in pursuit of higher levels of work output: the alternative is to utilise their enhanced productivity to maintain output constant and to reduce the intensity of their work or to enjoy more leisure time. And so the employer is charged with finding ways to raise employees' SWB *and* ways to convert any increased potential into productivity-enhancing behaviours.

2.3 Evidence on the links between SWB and performance at the level of the workplace

When one moves up to the level of the workplace, there is also clearly the potential for spillover effects. As workplaces and organisations are social entities in which workers interact, the level of wellbeing of Worker A may well affect the level of wellbeing of Worker B, and so worker wellbeing can affect workplace performance not only through its potential effect on the worker's own output, but also through its potential effect on the output of work colleagues. For instance, Felps et al (2006) propose a model – supported by a review of research on organisations – in which the negative affect and behaviour of one group member elicits negative feelings in other members of the group, and whereby these more widespread negative feelings then impair levels of co-operation and creativity within the group as a whole.

Turning to impact on financial performance, one must consider the financial benefits and costs of raising employees' SWB, over and above any impact on productivity. It may be costly for employers to implement policies, practices and monitoring systems aimed at improving or maintaining SWB. The productivity-enhancing effects of raising SWB must therefore at least equal these additional costs if initiatives to raise SWB are not to harm the financial performance of the workplace or firm.

These various issues serve to emphasise the importance of examining the links between SWB and performance in real-world settings and at a group level: that is at the level of the workplace or organisation. The evidence is more limited at this level, however, which may partly be attributed to the greater difficulties of conducting controlled experiments in real workplaces or firms, or even of obtaining repeated measures over time to create longitudinal datasets.

Correlations between SWB and workplace or firm-level productivity have been found by Harter et al (2002) and Patterson et al (2004). Harter et al (2010) also find a positive correlation between employee SWB and business-unit profitability, whilst positive associations with business outcomes have also been found in non-profit organisations, including schools (e.g. Ostroff, 1992; Currell, et al, 2005) and hospitals (e.g. Robertson et al, 1995). A key limitation of most of these studies, however, is that they do not address the twin concerns of unobserved heterogeneity and endogeneity. One study which suggests that the former may be particularly important is that of Bartel et al (2011), who investigated the relationship between employee attitudes and workplace performance across 193 branches of a US bank. They found that branches in which employees had more favourable attitudes had better sales performance and were less likely to close down, but they also found that these links could be explained by other, unobserved characteristics of the branches.

The only experimental intervention that we are aware of in this area is reported by Proudfoot et al (2009). They randomly allocated 81 employees from a sample of 136 workers in a British insurance firm to a training programme which aimed to improve employees' levels of self-esteem and job satisfaction, and to reduce their levels of psychological distress. At a follow-up three months after the intervention, SWB had improved among the intervention group relative to the control group. Employee turnover was also lower in the intervention group and, two years later, their productivity had also improved (measured in terms of their sales figures versus the average for their division).

Larger-scale experiments involving representative samples of firms are difficult to implement in practice, but Bockerman and Ilmakunnas (2012) use quasi-experimental methods to convincingly demonstrate a causal impact of employee SWB on workplace productivity in a representative sample of Finnish manufacturing plants. They use a single, overall job satisfaction measure from the European Community Household Panel Survey over the period 1996-2001 and match employees' responses on this measure to data on the productivity of the employees' workplace that is available from an administrative database. Their baseline estimate found that a one point increase (on a six-point scale) in the average level of job satisfaction among workers at the plant increases the level of value-added per hour worked two years later by 3.6 percentage points, after controlling for other factors. This estimate rose to 9 percentage points in a two-stage estimation

approach designed to account for unobserved establishment-level heterogeneity.[1] However tests on their data indicated that job satisfaction was, in part, influenced by the level of productivity in the plant (i.e, job satisfacation was not exogenously determined). Employees' satisfaction with their housing situation was thus used as an instrumental variable to purge the job satisfaction measure of any resulting bias arising from this endogenous relationship.[2] The positive effect of job satisfaction on workplace productivity remained under the instrumental-variables approach, thereby providing a robust indication of a causal effect – at least in this particular sample (Finnish manufacturing plants).

Whilst these few studies are encouraging, more research is needed at the level of the workplace or firm in order to be able to move to greater levels of generalisation. This is the primary motivation for our analysis of WERS, reported below.

3. Data and methods

3.1 The Workplace Employment Relations Survey

We analyse linked employer-employee data from the Workplace Employment Relations Survey 2011 (WERS). Appropriately weighted, it is a nationally representative survey of workplaces in Britain with 5 or more employees covering all sectors of the economy except agriculture and mining (van Wanrooy et al., 2013). The analysis exploits three elements of the survey. The first is the management interview, conducted face-to-face with the most senior workplace manager responsible for employee relations. Interviews were conducted in 2,680 workplaces between March 2011 and June 2012 with a response rate of 46%. The second element is the survey of employees, distributed in workplaces where a management interview was obtained. Self-completion questionnaires were distributed to a simple random sample of 25 employees (or all employees in workplaces with 5-24 employees) in the 2,170 workplaces where management permitted it. Of the 40,513 questionnaires distributed, 21,981 (54%) usable ones were returned.[3]

The third element of the survey is the panel component to the sample. Among the 2,680 productive workplaces in 2011, some 989 were panel workplaces that had previously been interviewed in 2004. The management response rate among this group of panel workplaces was

[1] In the first stage, Bockerman and Ilmakunas estimate a productivity equation comprising all observed time-varying characteristics of the plant except job satisfaction, and extract the residual (that part which remains unexplained). The average residual for each plant is then regressed on the average job satisfaction in the plant over the period 1996-2001.

[2] The identification assumption is that satisfaction with housing, whilst correlated with job satisfaction, can reasonably be excluded from the analysis of workplace labour productivity since any association would only operate through its links to job satisfaction.

[3] An additional 3,858 questionnaires were distributed at 247 workplaces where there were no employee questionnaires returned. We assume that these questionnaires were never distributed by the employer (van Wanrooy et al., 2013: 210) so they are not included in the figures in the text.

52 per cent. Some 600 of these 989 workplaces generated employee questionnaires in both 2004 and 2011 (providing 7,943 employee responses in 2004 and 7,324 employee responses in 2011).

3.2 Empirical strategy

We use both the cross-sectional data for 2011 and the panel data for 2004-2011 to assess the relationship between the level of employee SWB at a workplace and workplace performance.

We begin with the cross-sectional analysis, which has the advantage of a larger sample. We regress the level of performance ($\boldsymbol{p}$) in 2011 for workplace *i* on a measure of the mean level of job satisfaction among employees at workplace *i* ($\overline{\boldsymbol{JS}}_{\boldsymbol{i}}$), the mean level of job-related affect among employees at workplace *i* ($\overline{\boldsymbol{JRA}}_{\boldsymbol{i}}$), and a set of other workplace and workforce characteristics ($\boldsymbol{X}_{\boldsymbol{i}}$)which serve as controls.

$$\boldsymbol{p}_{\boldsymbol{i}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\overline{\boldsymbol{JS}}_{\boldsymbol{i}} + \boldsymbol{\gamma}\overline{\boldsymbol{JRA}}_{\boldsymbol{i}} + \boldsymbol{\delta}\boldsymbol{X}_{\boldsymbol{i}} + \boldsymbol{\epsilon} \qquad (1)$$

We then move on to analyse the panel sample. The sample is smaller, but is better able to address concerns about unobserved heterogeneity, as we can estimate first-difference models which examine *changes* in SWB and performance *within* workplaces over time.[4]

$$\Delta\boldsymbol{p}_{\boldsymbol{i}} = \boldsymbol{\beta}\Delta\overline{\boldsymbol{JS}}_{\boldsymbol{i}} + \boldsymbol{\gamma}\Delta\overline{\boldsymbol{JRA}}_{\boldsymbol{i}} + \boldsymbol{\delta}\Delta\boldsymbol{X}_{\boldsymbol{i}} + \boldsymbol{\epsilon} \qquad (2)$$

We are also able to use the panel sample to test for the possibility of reverse causality: we test for this directly by investigating whether we can predict workplace SWB in 2011 as a function of the workplace's performance in 2004.

We attach particular weight to the findings from the panel analysis because of its ability to tackle some of the issues that may confound attempts to draw causal inferences about the links between employee SWB and workplace performance. Nevertheless, it is clear that we cannot make strong causal inferences because we lack a true identification of the causal impact of SWB on workplace performance. However, as we show in Section 4, our results are consistent with the those found by Bockerman and Ilmakunnas (2012) using a quasi-experimental approach.

3.3 Measures of SWB

Respondents to the WERS Survey of Employees provide measures of their wellbeing which, when aggregated, can be used to characterize workplaces according to the wellbeing of their workers. The 2011 WERS collects information on employees' satisfaction with nine aspects of their job, namely pay, sense of achievement, scope for using initiative, influence over the job,

[4] This is virtually identical to estimating a fixed effects model, in a two-period panel such as ours.

training, opportunity to develop skills, job security, involvement in decisions and the work itself. Each domain of job satisfaction is rated on a five-point scale from 'Very satisfied' to 'Very dissatisfied'. The nine measures were each recoded into (-2,+2) ratings and used to create an additive measure of job satisfaction for each employee with a scale running from -18 to +18.[5] The employees' scores on this additive scale were then aggregated to compute the overall mean level of job satisfaction for the workforce. We also constructed measures which identified the share of workers who were very satisfied, and the share who were very dissatisfied; these allowed us to investigate any asymmetry in the effects of SWB on performance - as found in an earlier analysis of employees' propensity to quit their job (Green, 2010). It can be noted that this is a much more complete set of SWB measures than ordinarily appears in a national survey. Bockerman and Ilmakunnas (2012), for example, had to be content with a single job satisfaction item.

In addition to the nine job satisfaction items, employees were also asked to rate their job-related affect. They were asked: "Thinking of the past few weeks how much of the time has your job made you feel....tense, uneasy, worried, gloomy, depressed, miserable?". Responses are coded along a five-point scale: "all of the time", "most of the time", "some of the time", "occasionally" and "never". The first three items are a subset of Warr et al's (2013) anxiety-contentment scale, while the latter three are part of his depression-enthusiasm scale. A workplace-level mean was computed in a similar way to the job satisfaction measure reported above.[6] In addition, 'asymmetric' measures were also computed to identify the share of workers who "never" felt anxious or "always" or "mostly" felt anxious.

3.4 Measures of performance

Workplace performance was measured using the manager's subjective assessment on three separate measures. The managerial respondents to the survey were asked: "Compared with other workplaces in the same industry how would you assess your workplace's...financial performance; labour productivity; quality of service or product?". They chose one of five responses presented to them on a show card ranging from "a lot better than average" to "a lot below average". The percentage of managers saying their workplace performance was "a lot below average" was very small, so these responses were combined with those saying "below average" to form a four-point scale (1,4). The three subjective workplace performance measures are positively and significantly correlated such that those scoring high (low) on one indicator tend to score high

[5] Factor analysis of the nine items reveals a single factor with an eigen value of 5.34 accounting for 59 percent of the variance in job satisfaction scores. The additive scale also has a high scale reliability coefficient, or alpha, of 0.90.
[6] As in the case of the job satisfaction scale, this is supported by factor analyses which revealed a single factor with an eigen value of 4.42 accounting for 74 percent of the variance in workplace-level wellbeing. The alpha scale reliability coefficient is 0.93 for the six items.

(low) on the other two.[7] Thus, although distinct, these three measures may relate to a single underlying workplace performance scale.[8] We therefore constructed an additive scale from three performance items, summing the items then subtracting 3, such that the scale ran from 0 ("below average" performance on all three items) to 9 (performance "a lot better than average" on all 3 items).

When investigating workplace influences on performance it is more conventional to rely on accounting measures such as sales per employee and value added per employee. They have the advantage of being measured along a cardinal scale against which one can readily quantify correlations with other workplace factors, such as the average of employee wellbeing at the workplace. Although WERS collects such measures with its Financial Performance Questionnaire (FPQ) we prefer to focus on the subjective measures of workplace performance for two reasons. First, a much higher percentage of workplace managers feel able to provide an answer along the ordinal scale presented in the show card. Eighty-seven per cent are able to do so on all three subjective performance measures, whereas the number of responses to the FPQ is low (n=545, which is 20 per cent of the respondents to the management questionnaire). Second, earlier studies have validated the subjective performance measures, confirming that they are predictive of subsequent workplace closure, for example, and are associated with other workplace features in the way theory might predict (Forth and McNabb, 2008; Machin and Stewart, 1990, 1996). In contrast the managers responsible for employment relations who complete the WERS managerial questionnaire find it difficult to obtain the information necessary to provide accurate responses to the FPQ. For instance, they are often only able to provide information at the firm level, rather than workplace level. Consequently, the accounting measures of performance are not immune to concerns about sizeable measurement error.

4. Results

The results from the WERS analyses are presented in two parts. The first set of results is based on cross-sectional analyses of the 2011 survey. The second set of results is based on analyses of the 2004-2011 panel survey.

4.1 Analysis of the 2011 WERS Cross-Section

As noted above, the dependent variables for the analysis comprise four measures of workplace performance. The distribution of managers' responses on each of these four items in our cross-section sample is presented in Figure 2. The figure shows the distribution of workplace

[7] The correlation coefficients in the weighted data are: financial performance and labour productivity 0.44; financial performance and quality 0.25; labour productivity and quality 0.33. They are all statistically significant at the 1 per cent level.
[8] This is confirmed by a high scale reliability coefficient, or alpha, for the three performance items of 0.79.

performance in response to these questions after having weighted the data so that they are representative of the population from which the sample was drawn.

[Figure 2 here]

The distributions for financial performance and labour productivity are quite similar: the vast majority of managers say their workplace is performing at the average for the industry or "better than average", with respondents split roughly evenly between these two categories. A small minority - one-sixth in the case of financial performance and one-in-seven in the case of labour productivity - think their workplace is performing either "a lot better than average" or "below average". The distribution for the quality of product or service looks a little different: the distribution is shifted to the right relative to financial performance and productivity because a greater proportion think of themselves as performing relatively well compared to the industry average. Although there is some bunching of responses in the middle of the performance distribution, there is still substantial variance in managers' evaluations permitting us to investigate possible links between workplace performance and employees' wellbeing.

Performance on the additive scale is fairly normally distributed with one-quarter (24 per cent) of workplaces scoring 5, which is the mid-point in the distribution, although the upper tail - those scoring themselves "a lot better" or "better than average" on all three items - is a little thicker than the left tail which identifies the worst performing workplaces relative to their industry average.

Turning to the measures of workforce well-being, the distribution of the workplace means is given for each facet of job satisfaction in Figure 3. Most are skewed towards the top end of the satisfaction distribution, as is often the case when one presents job satisfaction distributions at the level of individual employees. The peak of the workplace mean job satisfaction distribution is normally around four, equivalent to an average rating of "satisfied". Only in the case of pay satisfaction is the peak of the workplace mean distribution somewhere near the middle of the satisfaction ranking. Relatively few workplaces have a mean job satisfaction score below three, as indicated by the long tails to the left of the distributions, the exception being pay satisfaction..

[Figure 3 here]

The workplace means for the separate measures of job-related affect are presented in Figure 4. The left-hand tails to these distributions indicate that there are few workplaces characterised by high levels of depression or anxiety, although tension and worry appear more common than the other items.

[Figure 4 here]

Figure 5 then shows the workplace distributions of the additive scales. The left-hand panel shows the workplace mean of the additive scale of job satisfaction. Relatively few workplaces are in negative territory with average scores in the "dissatisfaction" zone. Equally, few score close to the maximum 18. The right-hand panel of Figure 5 then presents the workplace mean of the single additive scale of job-related affect. With a mean of over 6 and a long, shallow left tail, it is clear that, in most workplaces, most employees do not suffer on-going job-related "ill-being". If we were to consider the two subscales denoting anxiety-contentment and depression-enthusiasm, it is apparent from Figure 4 that the distribution of mean enthusiasm would be to the right of that for mean contentment.

[Figure 5 here]

To analyse the relationship between SWB and workplace performance, we ran ordered probit regressions for the three separate performance measures, thereby taking account of their ordinal scales. We ran ordinary least squares (OLS) estimates for the additive performance scale since this more closely approximiates a continuous scale.[9] All analyses are survey-weighted to account for the probability of a workplace being sampled for the survey and to account for the probability that any employee questionnaires will be returned from a sampled workplace.[10]

Our primary analyses used the workplace mean SWB scores presented in Figure 5. These distinguish between the average level of job satisfaction, on the one hand, and the average level of job-related affect on the other. However, the literature finds some evidence that the effects of SWB on individuals' performance can be asymmetrical such that the effects of being, say, very satisfied or very dissatisfied may not be apparent if one focuses solely on mean satisfaction (eg. Green, 2010). We therefore ran models incorporating workplace means for being "very satisfied" and "very dissatisfied" and, in the case of job-related affect, the workplace means for being "usually well" - characterised in terms of "never" feeling depression and anxiety - and "usually

[9] None of the results presented later are sensitive to the choice of estimator. Results relating to the additive performance scale are similar if one estimates ordered probit models.

[10] In 510 of the 2680 workplaces surveyed the manager refused to permit questionnaires to be distributed to employees. In a further 247 workplaces none of the employee questionnaires that were distributed were returned to the survey agency (Deepchand et al., 2014: Table 4.14). It is conceivable that workplace non-response to the employee survey may have been correlated with poor employment relations and thus ill-being at the workplace. If so, the completed responses paint a picture of employee wellbeing which is upwardly biased. This does not necessarily mean that the estimated relationship between wellbeing and workplace performance is biased in any way. Nevertheless, the non-response weights can adjust for this to some extent using what is known about non-respondent workplaces to reweight the data such that the workplaces with at least one employee respondent resemble all workplaces on observable features such as the manager's perception of the climate of employment relations.

unwell" - characterised in terms of "always" or "mostly" feeling depression and anxiety.[11] The distributions of these variables are not shown for brevity, but the results are summarised below.

The analyses begin by establishing the raw correlation between the measure of workplace SWB and workplace performance. Then control variables are incorporated to identify the independent association between SWB and workplace performance. The two dimensions of SWB are incorporated alongside one another. The results from the orderd probit regressions of the separate performance measures are presented in Table 2, whilst the results from the OLS regressions of the additive performance measure are presented in Table 3.

[Table 2 and Table 3 here]

The results presented inTable2 and Table 3 show that the average level of employee job satisfaction among employees at the workplace is positively correlated with all four workplace performance measures (financial performance, labour productivity, and the quality of output/service, relative to the industry average, and the workplace performance additive scale constructed from the three measures to assess overall workplace performance). These positive correlations are present not only in the raw data, but also after the addition of our standard set of controls. They also persist after testing the sensitivity of the results to the inclusion of a measure of average hourly wages among employees at the workplace. In contrast, job-related affect is not correlated with workplace performance, regardless of the measure of performance that is used and – with the sole exception of Model [7] – regardless of the specification.

It was noted earlier that we also constructed ‘asymmetric’ measures of SWB to identify workpalces with large (or small) proportions of employees with particularly high or low SWB. Sensitivity tests which replaced the measures of mean SWB with these asymmetric measures found that workplaces with larger shares of "very satisfied" employees had higher labour productivity, higher quality of output, and higher overall performance. Workplaces with larger shares of "very dissatisfied" employees had lower financial performance and lower overall performance on the additive scale. Again, the measures of job-related affect were not statistically significant in any specification.

These various findings are noteworthy since other research such as Green (2010) has pointed to the importance of job satisfaction, as opposed to job-related affect, in predicting individual behaviour such as quits. It is therefore notable to find that job satisfaction is the dimension of

[11] Like the mean scores for job satisfaction and job-related affect, these measures were constructed by taking the scores for each employee and dividing through by the number of employees at the workplace responding to the question. For instance in the case of mean "very dissatisfied", this was simply the workplace mean for the number of times an employee says he/she was "very dissatisfied" on each of the job satisfaction items. Focusing on the tails in this way can help to avoid some of the assumptions that are needed about the underlying distribution of SWB when constructing mean SWB (Bond and Lang, 2014).

SWB that also appears to matter at workplace-level. The results are also consistent with Bockerman and Ilmakunnas (2012) who found a positive association between mean job satisfaction and workplace performance in their study for Finland.

It is not straightforward to quantify the size of the SWB "effect" on workplace performance because both the performance and SWB measures are based on ordinal scales. However, the coefficients underlying the results reported in Table 3 provide some kind of guide. The coefficient for mean overall job satisfaction of around 0.07 indicates that an increase of 1 point in a workplace's mean overall job satisfaction scale (a scale which ranges between -18 and +18) results in an increase of 0.7 points in the workplace performance scale which runs from 0 to 9. To put this into context, moving from, say, the 25th percentile of the mean employee job satisfaction scale to the median (an increase in the mean job satisfaction scale from 3.3 to 5.6, or 2.3 points on the scale) would result in an increase of 1.6 points on the 10-point additive workplace performance scale, which is actually equivalent to one standard deviation on the additive performance scale.[12]

4.2 Analysis of the 2004-2011 WERS Panel

Having presented the cross-sectional correlations, we now move onto the analysis of the panel sample. Although the panel sample is smaller in size (around one third of the size of the cross-sectional sample), it does offer two distinct advantages.

First it enables us to investigate whether the cross-sectional associations seen in the previous section are simply the result of unobserved heterogeneity (omitted variable bias). There is a possibility that, whichever set of control variables are used to identify the independent association between employees' SWB and workplace performance, the analyst may not observe features of the workplace that are jointly correlated with both employee SWB and workplace performance, and that these fixed, unobserved characteristics may thus obscure the true independent association between the two items of interest. An example might be good management: workplaces with good managers may have ‘happier’ workforces and also perform better than the average for their industry. We are able to address this issue, at least in part, by using the panel survey to identify whether *changes* in workplace performance occur alongside *changes* in SWB within the same workplace over time.

Second, the panel sample enables us to address the problem of reverse causality. Although there are good reasons to suspect a causal relationship running from employee SWB to workplace performance, it is plausible that good workplace performance will lead to employees becoming happier. Employees' SWB is liable to rise and fall with the fortunes of the employer, in much the

[12] 2.3 multiplied by the 0.7 coefficient.

same way as a nation's wellbeing rises and falls with Stock Market prices, in part because employee welfare rises with prosperity, resulting in a "feel good" factor (Deaton, 2012).

The measures of performance available to us in the panel sample are identical to those available in the cross-section. Accordingly, each workplace provides information on its performance relative to the industry average in 2004 and then again in 2011 on a 4-point scale ranging from below average to a lot above average.[13] A workplace moving from the bottom of the scale in 2004 ("below average") to the top of the scale ("a lot above average") would score the maximum +3 points on this change variable. A workplace going in the opposite direction scores -3.

Figure 6 shows the number of workplaces moving up and down these performance scales over the period. The figure presents unweighted frequencies for the 441 workplaces in the panel. It is apparent that, while many workplaces provide the same rating in both years, producing a change score of zero, most move around with the numbers reporting improved performance approximating the numbers reporting poorer performance. The bottom right hand panel of Figure 6 shows movement along the additive change in performance scale which, as noted earlier, simply combines the scores from the changes in financial performance, labour productivity and quality of output/service. Around one-fifth of workplaces score zero, indicating their workplace performance has remained unchanged, relative to the industry average over the period. The proportion improving their performance is similar to the proportion doing less well. Most workplaces that do move tend to move by 1 or two points on the nineteen point scale.

[Figure 6 here]

The job satisfaction and wellbeing measures in the panel are identical to those presented earlier for the cross-sectional analysis, with two exceptions. Instead of nine job satisfaction items there are eight: the missing item relates to satisfaction with opportunities to develop skills, which was introduced only in 2011. Instead of six job-related affect items, the panel contains three items measured in 2004 and 2011. These are the anxiety-contentment items, namely tense, worried and uneasy.[14] As in the case of the workplace performance measures it is straightforward to construct measures identifying changes in SWB over time within workplaces by comparing the 2004 workplace means with the 2011 workplace means. These changes are presented in Figure 7. As is apparent from the left-hand panel, around 10 per cent of workplaces saw little or no change in their overall mean job satisfaction score. Workplaces at the 25th percentile of the distribution experienced a decline in mean job satisfaction of 2.3 points while those at the 75th percentile experienced an increase in mean job satisfaction of 2.2 points. In contrast, there does appear to

[13] Recall, although the survey questions also include the category "a lot below average" few managers give this rating, so these responses have been combined with those saying performance was "below average".
[14] The depression-enthusiasm items are only available in 2011, so they are absent from the panel. A further three anxiety-contentment items were collected in the 2004 survey but not in 2011. These relate to being calm, relaxed, and content.

have been a small rise in wellbeing, as measured by the mean of the 3-item contentment-anxiety scale, among the workplaces surviving over the period 2004 to 2011. The median rise is 0.67 points on a scale running between -12 and 12.

[Figure 7 here]

To identify the independent association between within-workplace changes in workplace performance and employees' subjective wellbeing, we ran ordinary least squares regressions which treat changes in performance as a cardinal scale.[15] Many of the other workplace characteristics included in the cross-sectional models do not change across time. However we are able to include time-varying controls for the number of employees in the workplace and the mean hourly wage of employees; the latter is a useful summary measure helping to capture changes in the quality of the workforce. The models with controls always account for a significant amount of the variance in performance with an r-squared typically in the range of 0.10 to 0.15. The regressions are survey-weighted to account for the probability of a workplace being sampled for the survey and to account for the probability that any employee questionnaires will be returned from a sampled workplace.

The results from the panel analyses are presented in Table 4 and Table 5. The tables show that increases in the average level of job satisfaction at the workplace are associated with increases in all four workplace performance measures. The associations found in the cross-sectional analysis are thus not simply an artefact of fixed, unobserved characteristics of workplaces that are themselves jointly associated with higher SWB and higher performance.

[Table 4 and Table 5 here]

The cross-sectional analysis sought also to investigate asymmetric effects, and we do so again here. In these analyses (not shown), workplaces with rising job dissatisfaction experience deterioration in all four performance measures, whereas workplaces with an increase in "very satisfied" employees experience rising quality of output or service and an increase in the additive performance measure, but not financial performance or labour productivity.

As in the cross-sectional analysis, changes in job-related affect are not associated with workplace performance, regardless of the measure used, although there is some evidence that an increase in employees reporting "ill-being" most or all of the time is associated with deteriorating quality of output or service and a decline in the additive performance scale, at least in some models.

As a further extension, we also used the panel data to investigate whether SWB was associated with workplace closure: as an extreme test of whether low SWB can bring a workplace to

[15] Results are robust to ordered probit regressions which treat the changes in performance as ordinal.

extinction. The panel contains information on workplace closure for all but a handful of the workplaces surveyed in 2004. Some 1,718 workplaces with SWB information from employees in 2004 provided information regarding their status in 2011 which identified whether or not they had closed between 2004 and 2011. Seventeen per cent had done so.[16]

Workplace closure is a binary outcome coded zero if the workplace survives and one if it has closed by the time of the 2011 survey. If a workplace has closed we do not know when this took place - only that it had occurred before workplaces were followed up for a panel interview in 2011. Probit models were run to estimate this outcome for all workplaces surveyed in 2004 where one or more employee surveys had been completed and returned. The control variables used in these analyses are nearly identical to those used in the 2011 cross-sectional analysis: the only differences are that the workplace closure models contain controls collected in 2004 and additional sensitivity checks were performed where we incorporated workplace performance in 2004 as an additional control. All the SWB measures used in the workplace closure models are recorded in the 2004 survey. Models had sample sizes ranging between 1713 and 1716 workplaces.

The workplace closure models with controls were always highly jointly statistically significant confirming that it is possible to predict workplace closure with workplace features collected in WERS surveys. However, none of the SWB scales were statistically significant in any of the models. We omit a detailed presentation of the results, for reasons of brevity, but they contrast with the only other study we know of this kind, in which Bartel et al. (2011) study the association between the closing of branches in a large commercial bank and mean branch-level employee "positive attitudes" two years earlier. They found the bank closed branches with more negative employee attitudes.

4.3 Test for reverse causation

Finally, we used the panel data to test for reverse causality, in order to examine whether higher levels of workplace performance may *lead to* higher levels of SWB. We tested for reverse causation by specifying models that seek to predict the level of SWB in 2011 with workplace performance in 2004. None of the models revealed a statistically significant positive relationship between workplace performance in 2004 and mean job satisfaction in 2011; if anything, the relationship was negative (Table 6). When we specified models that sought to predict the level of workplace performance in 2011 with measures of SWB for 2004, we obtained positive coefficients that were on the borderline of statistical significance in two of the four models (Table 7). These findings are broadly in line with those reported elsewhere by Harter et al (2010).

[16] For discussion of the correlates of workplace closure for all workplaces, irrespective of whether they provided employee survey data in 2004, see Van Wanrooy et al. (2013: 26-28).

[Table 6 and Table 7 here]

Although we lack a robust means of truly identifying the causal effect of SWB on performance, our results tend to support the contention in our earlier conceptual framework and theoretical review, which is that the arrow of causation is more likely to run from SWB to workplace performance than it is to run in the other direction.

5. Conclusions

There is good reason to suspect that policies and practices which target improvements in subjective wellbeing may raise workplace performance and result in economic growth. Yet there is relatively little empirical evidence on the relationship between employees' subjective wellbeing and performance at the level of the workplace. One reason is that few nationally representative datasets have measures of both worker wellbeing and workplace performance that are necessary to test any association. This paper reports new empirical analyses of a rich linked employer-employee survey in Britain which does contain these measures.

We find a positive statistically significant relationship between mean job satisfaction at the workplace and workplace performance. This finding is present in both the cross-sectional and panel analyses and is robust to various estimation methods and model specifications. Employee job satisfaction is positively associated with workplace financial performance, labour productivity and the quality of output and service. Workplaces experiencing an improvement in job satisfaction between 2004 and 2011 - measured at the mean, or measured in terms of an increase in the proportion "very satisfied" or a reduction in the proportion "very dissatisfied" - also experience an improvement in performance between the two years. By contrast, there is no association between job-related affect and workplace performance.

This is the first such study for Britain. The findings are consistent with the proposition that employers who are able to raise employees' job satisfaction may see improvements in the performance of their workplace across a variety of different performance metrics. Although we cannot state definitively that the link is causal, the findings are consistent with the causal relationship suggested by conceptual work in this area and other, quasi-experimental evidence. There is therefore a prima facie case for employers to seek to maintain and raise levels of job satisfaction among their employees.

6. References

Bartel, A. P., Freeman, R. B., Ichniowski, C. and Kleiner, M. M. (2011) "Can a workplace have an attitude problem? Workplace effects on employee attitudes and organizational performance", *Labour Economics*, 18, 411-423.

Blanchflower D, Oswald A and Stewart-Brown S (2012) *"Is psychological wellbeing linked to the consumption of fruit and vegetables?"* Working Paper No. 996. Economics Department, University of Warwick. Forthcoming in *Social Indicators Research*.

Bockerman, P. and Ilmakunnas, P. (2012) "The Job Satisfaction-Productivity Nexus: A Study Using Matched Survey and Register Data", *Industrial and Labor Relations Review*, 65, 2: 244-262

Bond, T. N. and Lang, K. (2014) *The Sad Truth About Happiness Scales*, NBER Working Paper No. 19950

Clark A (2001) "What really matters in a job? Hedonic measurement using quit data", *Labour Economics*, 8: 223-242.

Currell S, Towler A, Judge T and Kohn L (2005) "Pay satisfaction and organizational outcomes", *Personnel Psychology*, 58: 613-640.

Cunningham M (1988) "What do you do when you are happy or blue? Mood, expectancies and behavioural interest", *Motivation and Emotion*, 12: 309-331.

Deaton, A. (2012) "The financial crisis and the wellbeing of Americans", *Oxford Economic Papers*, 64: 1-26

Deepchand, K., Drever, E., Gilby, N., Prestage, Y., Prudon, S., Tipping, S. and Wood, M. (2013) *Workplace Employment Relations Study (WERS) 2011/12 Technical Report*, NatCen, London

Department for Business Innovation and Skills (2013) *Workplace Employee Relations Survey 2011* [computer file]. 4th Edition. Colchester, Essex: UK Data Archive [distributor]. SN: 7226, http://dx.doi.org/10.5255/UKDA-SN-7226-7

Diener E and Chan M (2011) "Happy people live longer: subjective wellbeing contributes to health and longevity", *Applied Psychology: Health and Well-being*, 3: 1-43.

Dolan P and Kahnemann D (2008) “Interpretations of utility and their implications for the valuation of health”, *The Economic Journal*, 118: 215-234.

Farrell D and Stamm C (1988) “Meta analysis of the correlates of employee absence”, *Human Relations*, 41: 211-227.

Felps W, Mitchell T and Byington E (2006) “How, when and why bad apples spoil the barrel: negative group members and dysfunctional groups”, *Research in Organizational Behaviour*, 27: 175-222.

Forth, J and McNabb R (2008) “Workplace Performance: A Comparison of Subjective and Objective Measures in the 2004 Workplace Employment Relations Survey”, *Industrial Relations Journal*, 39, 2: 104-123

Fredrickson B and Branigan C (2005) “Positive emotions broaden the scope of attention and thought-action responses”, *Cognition and Emotion*, 19: 313-332.

Grant N, Wardle J and Steptoe A (2009) “The relationship between life satisfaction and health behaviour: a cross-cultural analysis of young adults”, *International Journal of Behavioural Medicine*, 16: 259-268.

Green F (2010) “Well-being, job satisfaction and labour mobility”, *Labour Economics*, 17, 6: 897-903.

Hacket R (1989) “Work attitudes and employee absenteeism: a synthesis of the literature”, *Journal of Occupational Psychology*, 62: 235-248.

Harter J, Schmidt F, and Hayes T (2002) “Business-unit relationship between employee satisfaction, employee engagement and business outcomes: a meta-analysis”, *Journal of Applied Psychology*, 87: 268-279.

Harter J, Schmidt F, Asplund J, Killham E and Agrawal S (2010) “Causal impact of employee work perceptions on the bottom line of organisations”, *Perspectives on Psychological Science*, 5, 4: 378-389.

Hockey G (1986) “Changes in operator efficiency as a funcation of environmental stress, fatigue and circadian rhythms”, in K Boff, L Kaufman and J Thomas (eds) *Handbook of Perception and Performance*, Volume 2, New York: Wiley.

Isen A (1970) “Success, failure, attention and reaction to others: the warm glow of success”, *Journal of Personality and Social Psychology*, 15: 294-301.

Isen A, Daubman K and Nowicki G (1987) “Positive affect facilitates creative problem solving”, *Journal of Personality and Social Psychology*, 52: 1122-1131.

Judge TA, Thoresen CJ, Bono JE and Patten GK (2001) “The job satisfaction–job performance relationship: A qualitative and quantitative review”, *Psychological Bulletin* 127(3): 376–407.

Layard R. (2011) *Happiness: Lessons from a New Science*, 2nd edition, Penguin Books.

Lyubmirsky S, King L and Diener E (2005) “The benefits of frequent positive affect: does happiness lead to success?” *Psychological Bulletin*, 131, 6: 803-855.

Machin S. and Stewart M. (1996) “Trade Unions and Financial Performance”, *Oxford Economic Papers*, 49: 213-241

Machin, S. and Stewart, M. (1990) “Unions and the financial performance of British private sector establishments”, *Journal of Applied Econometrics*, 5: 327-350.

O’Donnell G, Deaton A, Durand M, Halpern R and Layard R (2014) *Well-Being and Policy*, London: Legatum Institute.

OECD (2013) *OECD Guidelines of Measuring Subjective Well-Being*, Paris; OECD Publishing.

Organ D and Ryan K (1995) “A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behaviour”, *Personnel Psychology*, 48: 775-802.

Ostroff C (1992) “The relationship between satisfaction, attitudes and performance: an organization-level analysis”, *Journal of Applied Psychology*, 77: 963-974.

Oswald, A. J., Proto, E. and Sgroi, D. (2014) "Happiness and Productivity", University of Warwick mimeo. Forthcoming in the *Journal of Labor Economics.*

Patterson M, Warr P and West M (2004) “Organizational climate and company productivity: the role of employee affect and employee level”, *Journal of Occupational and Organizational Psychology*, 77: 193-216.

Proudfoot J, Corr P, Guest D and Dunn G (2009) “Cognitive-behavioural training to change attributional style improves employee wellbeing, job satisfaction, productivity, and turnover”, *Personality and Individual Differences*, 46: 147-153.

Robertson A, Gilloran A, McGlew T, McKee K, McInley A and Wright D (1995) “Nurses’ job satisfaction and the quality of care received by patients in psychogeriatric wards”, *International Journal of Geriatric Psychiatry*, 10: 575-584..

Staw B, Sutton R and Pelled L (1994) “Employee positive emotion and favourable outcomes at the workplace”, *Organization Science,* 5: 51-71.

Stiglitz J., Sen A. and Fitoussi J.P. (2009) *Report by the Commission on the Measurement of Economic Performance and Social Progress.*

Stutzer A and Frey B (2010) “Recent advances in the economics of individual subjective well-being”, IZA Discussion Paper No. 4850.

Tinkler L and Hicks S (2011) *Measuring Subjective Well-Being*, Supplementary Paper, Office for National Statistics.

van Wanrooy, B., Bewley, H., Bryson, A., Forth, J., Freeth, S., Stokes, L. and Wood, S. (2013) *Employment Relations in the Shadow of Recession: Findings from the 2011 Workplace Employment Relations Study*, Palgrave MacMillan.

Warr P, Binl U, Parker S and Ingeoglu I (2013) “Four-quadrant investigation of job-related affects and behaviours”, *European Journal of Work and Organizational Psychology,* 23, 3: 343-363.

Zelenksi J, Murphy S and Jenkins D (2008) “The happy-productive worker thesis revisited”, *Journal of Happiness Studies*, 9: 521-537.

Figure 1: Illustration of the relationship between SWB and productivity for an individual employee

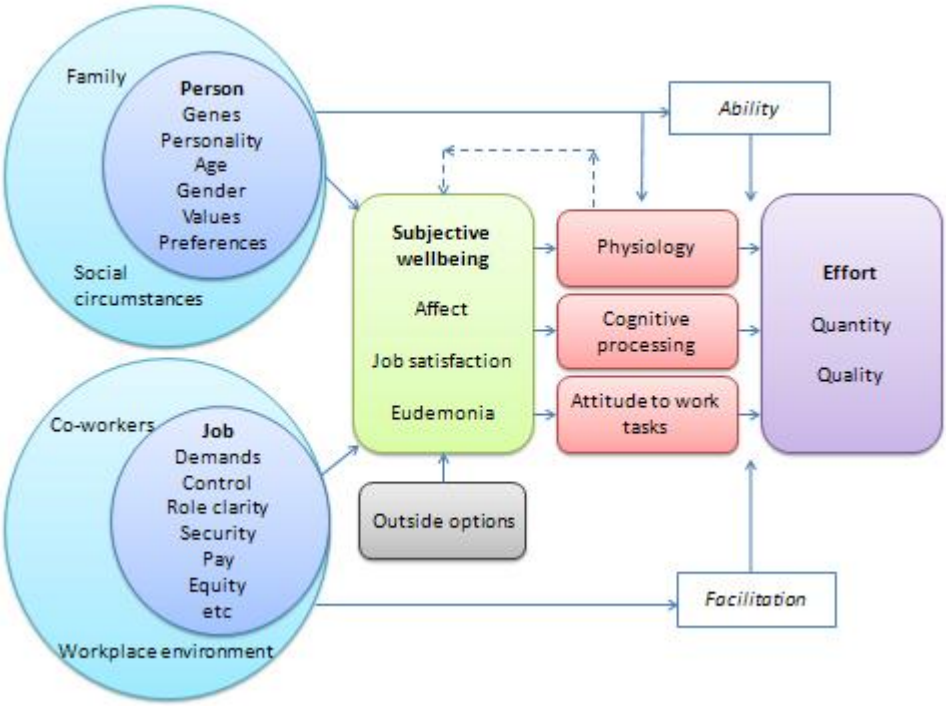
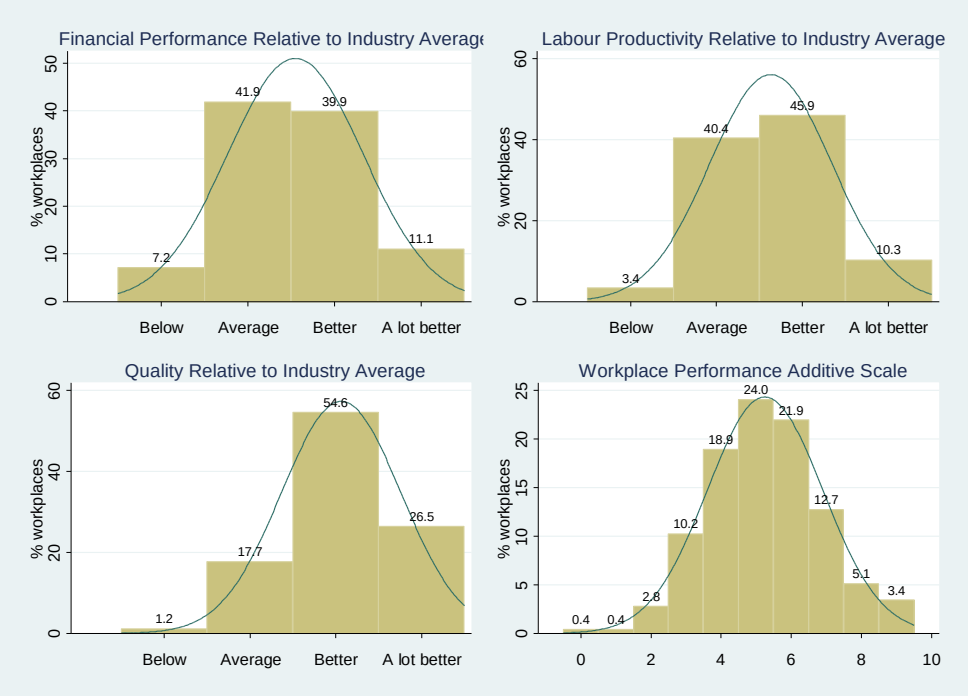


Figure 2: Workplace performance measures, 2011 Cross-Section

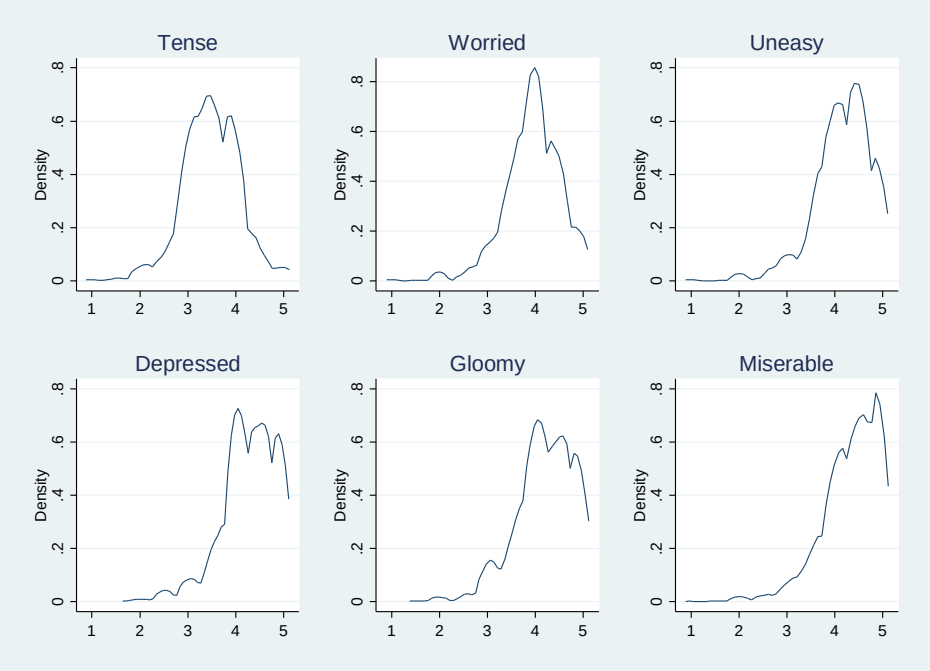


Source: 2011 WERS Cross-Section Survey

Figure 3: Distribution of Mean Workplace Job Satisfaction, Nine Facets, 2011 Cross-Section

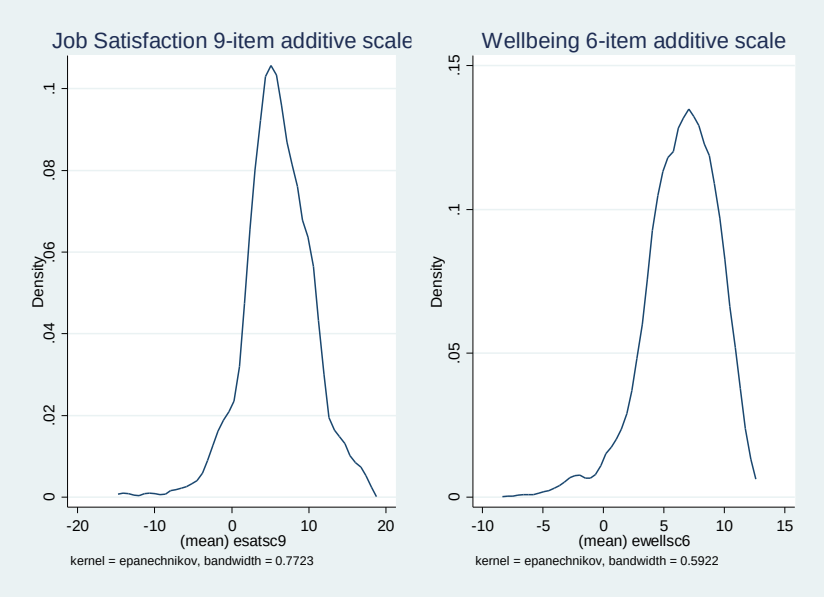
Source: 2011 WERS Cross-Section Survey

Figure 4: Distribution of Mean Workplace Job-Related Affect, Six Items, 2011 Cross-Section



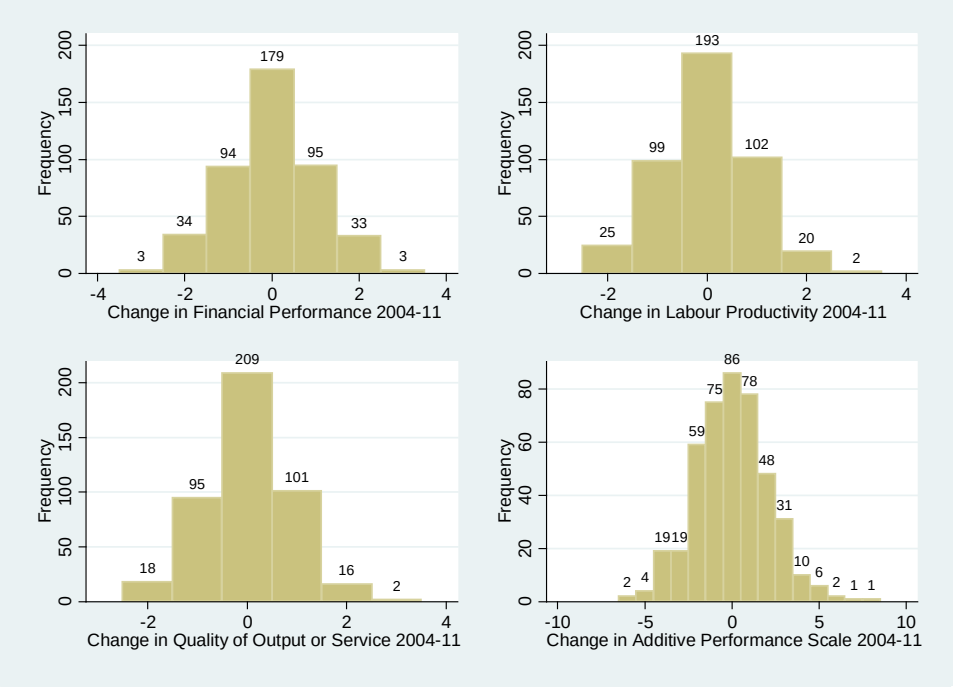
Source: 2011 WERS Cross-Section Survey

Figure 5: Distribution of Mean Workplace Job Satisfaction and Job-Related Affect, Additive Scales, 2011 Cross-Section



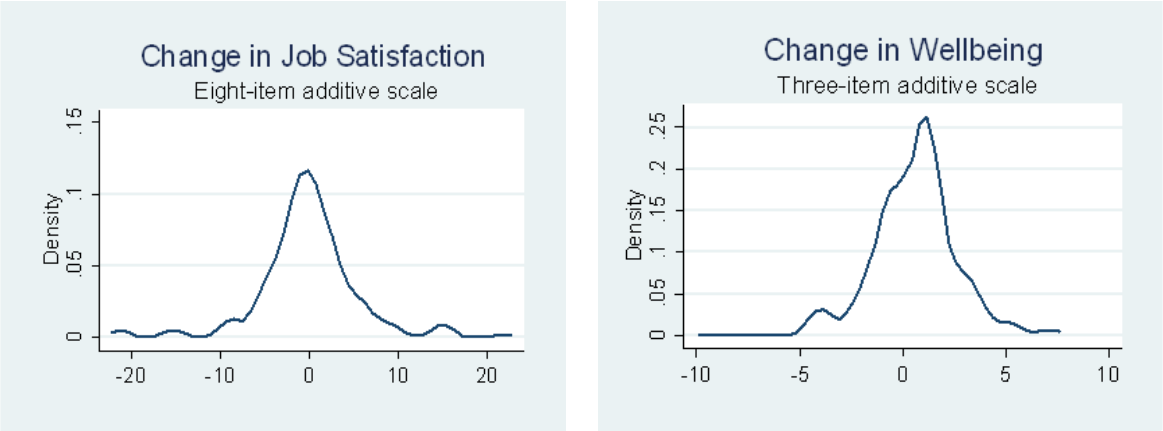
Source: 2011 WERS Cross-Section Survey

Figure 6 Within-Workplace Changes in Performance (unweighted number of workplaces), 2004-2011, Panel Survey



Source: WERS 2004-2011 Panel Survey

Figure 7 Within-workplace Change in Employee Wellbeing, 2004-2011, Panel Survey



Source: WERS 2004-2011 Panel Survey

Table 1: Differing approaches to the concept of subjective wellbeing, as applied to work

Hedonic wellbeing		**Eudemonic wellbeing**
Affective feelings engendered by the job	**Satisfaction with the job**	**Psychological functioning associated with the job**
Sub-components include...	*Sub-components include...*	*Sub-components include...*
Anxiety	Satisfaction with work tasks	Sense of meaning or purpose
Boredom	Satisfaction with pay	Sense of vitality
Enthusiasm	Satisfaction with job security	Sense of achieving your potential
Contentment	Satisfaction with training	Sense of personal development

Adapted from OECD (2013, Figure 1.1).

Table 2 Cross-sectional ordered-probit regressions for individual performance indicators

	Financial performance			Labour productivity			Quality of product or service		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Mean JS	0.023 *	0.041 ***	0.040 ***	0.036 **	0.033 **	0.031 **	0.067 ***	0.053 ***	0.053 ***
	(1.72)	(3.04)	(2.99)	(2.28)	(2.07)	(1.97)	(5.10)	(4.12)	(4.10)
Mean JRA	-0.005	-0.011	-0.010	-0.013	-0.017	-0.015	-0.030 *	-0.023	-0.022
	(-0.21)	(-0.51)	(-0.44)	(-0.69)	(-0.90)	(-0.81)	(-1.66)	(-1.28)	(-1.30)
Standard controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Mean hourly wage	No	No	Yes	No	No	Yes	No	No	Yes
Observations	*1,764*	*1,764*	*1,760*	*1,732*	*1,732*	*1,728*	*1,833*	*1,833*	*1,828*

JS: Job satisfaction; JRA: Job-related affect

Standard controls: single establishment; number of employees (6 dummies); workplace age (2 dummies); industry (12 dummies); public sector; region (11 dummies); union recognition (2 dummies); largest non-managerial occupational group (9 dummies).

T-statistics in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.10.

Table 3 Cross-sectional OLS regressions for additive performance scale

	Additive performance scale					
	[1]		[2]		[3]	
Mean JS	0.076	***	0.075	***	0.073	***
	(3.59)		(3.81)		(3.67)	
Mean JRA	-0.027		-0.030		-0.029	
	(-0.93)		(-1.15)		(-1.08)	
Standard controls	No		Yes		Yes	
Mean Average hourly wage	No		No		Yes	
Observations	*1,690*		*1,692*		*1,690*	

JS: Job satisfaction; JRA: Job-related affect

Standard controls: single establishment; number of employees (6 dummies); workplace age (2 dummies); industry (12 dummies); public sector; region (11 dummies); union recognition (2 dummies); largest non-managerial occupational group (9 dummies).

T-statistics in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.10.

Table 4 Panel first-difference models for individual performance indicators

	ΔFinancial performance		ΔLabour productivity		ΔQuality of product or service	
	[1]	[2]	[3]	[4]	[5]	[6]
ΔMean JS	0.104 ***	0.105 ***	0.085 **	0.086 **	0.088 ***	0.089 ***
	(3.00)	(3.12)	(2.24)	(2.26)	(3.90)	(3.90)
ΔMean JRA	-0.130	-0.123	-0.155	-0.151	-0.062	-0.061
	(-1.26)	(-1.18)	(-1.27)	(-1.24)	(-0.97)	(-0.95)
Controls	No	Yes	No	Yes	No	Yes
Observations	*597*	*597*	*597*	*597*	*597*	*597*

JS: Job satisfaction; JRA: Job-related affect

Controls: change in number of employees; change in mean hourly wage.

T-statistics in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.10.

Table 5 Panel first-difference models for additive performance scale

	ΔAdditive performance scale			
	[1]		[2]	
ΔMean JS	0.133	***	0.135	***
	(2.83)		(2.89)	
ΔMean JRA	0.015		0.006	
	(0.915)		(0.04)	
Controls	No		Yes	
Observations	*439*		*439*	

JS: Job satisfaction; JRA: Job-related affect
Controls: change in number of employees; change in mean hourly wage.
T-statistics in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.10.

Table 6: Panel model of influence of workplace performance in 2004 on SWB in 2011

	Mean job satisfaction in 2011	Mean job satisfaction in 2011	Mean job satisfaction in 2011
Financial performance in 2004	-0.587		
	(-1.42)		
Labour productivity in 2004		-0.696 *	
		(-1.64)	
Quality of product or service in 2004			0.219
			(0.55)
Observations	*506*	*491*	*529*

Standard controls (all measured in 2004): single establishment; number of employees (6 dummies); workplace age (2 dummies); industry (12 dummies); public sector; region (11 dummies); union recognition (2 dummies); largest non-managerial occupational group (9 dummies); mean hourly pay; workplace performance in 2004.
T-statistics in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.10.

Table 7: Panel model of influence of SWB in 2004 on workplace performance in 2011

	Financial performance in 2011	Labour productivity in 2011	Quality of product or service in 2011	Additive performance scale in 2011
Mean job satisfaction in 2004	0.025	0.063 **	0.033	0.040
	(0.77)	(2.10)	(1.15)	(1.56)
Mean job-related affect in 2004	0.000	-0.139	0.042	-0.032
	(0.00)	(-1.59)	(0.52)	(-0.41)
Observations	*440*	*440*	*440*	*440*

Standard controls (all measured in 2004): single establishment; number of employees (6 dummies); workplace age (2 dummies); industry (12 dummies); public sector; region (11 dummies); union recognition (2 dummies); largest non-managerial occupational group (9 dummies); mean hourly pay; SWB in 2004.

T-statistics in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.10.