Job Satisfaction and Quality Management: An Empirical Analysis

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Abstract

Purpose – Quality management requires increasing employee involvement that could empower employees, leading to employee and customer satisfaction. Although the literature describes a picture of increasing job demands and work intensification, the evidence of an association between employee job satisfaction and quality management remains mixed and narrow. This study, therefore, investigates this link in the wider economy, and addresses the roles of human resource management practices that target direct employee participation (job enrichment and high involvement management) in this relationship.

Design/methodology/approach – The Workplace Employment Relations Survey of 2004 (WERS2004) provides information on British workplaces including the use of specific quality and human resource management practices, employees' job satisfaction and other outcomes. Latent variable analysis identifies employers' approaches to quality management, job enrichment and high involvement management. Workplace-level regression analyses illustrate the link between job satisfaction and various desired organizational outcomes. Hierarchical two-level regression models are used to assess the link between quality management at workplaces and employee job satisfaction.

Findings – Although job satisfaction is positively associated with desired workplace outcomes (organizational commitment, productivity and quality), no significant link between quality management and employee job satisfaction is found. By contrast, a positive association between job enrichment and job satisfaction is confirmed, which may be weakened in the presence of quality management.

Practical implications – Given the potential impact of job satisfaction on organizational outcomes, job enrichment features should not be neglected when designing jobs so that an effective quality management strategy can be in place. Some weak positive association between high involvement and quality managements with perceived job demands is also observed, and this should be further investigated in more detailed studies of employee well-being.

Originality – This is a large empirical study on an economy-wide sample of workplaces and their employees.

Keywords – quality management, high involvement management, job enrichment, employee attitudes.

Paper type – Research paper

1. **Introduction**

Quality management is a philosophy aimed at achieving or exceeding customer expectations through an emphasis on employee involvement and continuous improvements in quality (Deming, 2000; Juran, 1993; Kaynak, 2003; Martinez-Lorente, Dewhurst and Dale, 1998; Molina-Azorin, Tari, Claver-Cortes and Lopez-Gamero, 2009). In practice, quality management has been implemented in various ways, ranging from the adoption of specific quality management practices that may vary according to the production system (White and Prybutok, 2001) to integrated management systems that emphasize overall organization competitiveness and sustainability and go beyond product quality (e.g. the European Foundation for Quality Management Excellence Model; the criteria of the Baldrige National Quality Program). The association between quality management and organizational performance has been subject of many studies (e.g. Bou and Beltran, 2005; Challis, Samson and Lawson, 2002; Cua, McKone and Schroeder, 2001; Flynn, Sakakibara and Schroeder, 1995; Molina-Azorin et al., 2009; Narasimhan, Swink and Kim, 2004; Powell, 1995; Samson and Terziovski, 1999; Shah and Ward, 2003). In spite of the diversity in implementations and measures that were considered, as illustrated by a recent review of this literature (Molina-Azorin et al., 2009: 204–208, Table 3), most of the empirical evidence supports some positive association. The overall expectation is that quality management reduces cost, achieves customer satisfaction, generates increased revenues and leads to market advantage (Anderson, Rungtusanatham, Schroeder and Devaraj, 1995; Kaynak, 2003; Merino-Diaz De Cerio, 2003; Piercy and Rich, 2009; Schroeder, Linderman and Zhang, 2005). Yet some authors have argued that performance gains may be achieved at the expense of employee well-being (Green, 2006; Landsbergis, Cahill and Schnall, 1999; Parker, 2003).

The literature portrays an ongoing debate on the potential employee outcomes of quality management. Some scholars argue that quality management is a source of more challenging work and as such is an opportunity to be smarter and have more control over one's own work (e.g. Womack, Jones and Roos, 1990), thus leading to a "highly motivating work environment" (Adler

and Cole, 1993: 86). Others associate quality management with high pressure working environments (Garrahan and Stewart, 1992; Green, 2006). Hence, the impact of quality management on well-being and, more specifically, whether it is associated with employee job satisfaction remains a research question.

Job satisfaction is an important dimension of employee well-being in its own right but is also a desired indicator of organizational success (Culbertson, 2009; Korunka, Scharitzer, Carayon and Sainfort, 2003). In fact, independently of the measures that were used and the specific practices implemented, several studies of quality management in services found strong positive associations between customer satisfaction and employee job satisfaction (e.g. Akdere, 2009; Brown and Lam, 2008; Hallowell, Schlesinger and Zornitsky, 1996; Zeithaml, Berry and Parasuraman, 1996). Consequently, customer satisfaction, a goal of quality management, may be achieved via employee job satisfaction, and as Schroeder et al. (2005) argued in their review of the evolution of quality, the human issues involved in quality management are of increasing interest to academics and practitioners in operations management.

In this context, the present study aims to investigate the association between quality management and job satisfaction using secondary data from a large economy-wide sample of workplaces and their employees, the UK Workplace Employment Relations Survey of 2004 (WERS2004). It assumes that the uses of management practices are indicators of managerial approaches at the workplace and develops measures of such approaches. The specific quality management practices in the data are: training in quality, training in problem solving, self-inspection of quality, the keeping of records of faults or complaints, the keeping of records on quality, customer surveying, quality targets, customer service targets, team briefings that involve quality, and just-in-time procedures. In addition, a range of human resource management (HRM) practices that target direct employee participation and have been linked to the human aspects of quality management (e.g. Akdere, 2009; Appelbaum, Bailey, Berg and Kalleberg, 2000) are included. These are: task variety, method control, timing control teamwork, functional flexibility,

quality circles, suggestion schemes, team briefing, induction, training in human relations skills, information disclosure, and appraisal.

The next section briefly reviews the related literatures on the potential effects of job satisfaction and the hypotheses that follow. Given job satisfaction's scope for having an impact, previous research on the link between quality management and job satisfaction is also considered so that competing views and the potential role of human resource management are inferred, thus leading to further hypotheses. Subsequently, the empirical part of the study is described: the data, the derived measures and analyses are summarized and the results reported. Finally, conclusions, limitations and further implications of the study are drawn.

2. Background, Hypotheses and Research Questions

2.1. The Potential Impact of Job Satisfaction

Success in motivating and retaining human capital has been often associated with high performance organizations (e.g. Capelli, 2000; Huselid, 1995). Favourable employee outcomes are also assumed to enhance management's legitimacy (Boxall and Purcell, 2003). In this context, job satisfaction is seen as a potential route to high performance (Becker and Huselid, 1998; Boxall and Purcell, 2003; Pfeffer, 1994; Wright, Gardner and Moynihan, 2003) and a potential mediator in a hypothetical chain from management practices to performance (Michie and West, 2004; Purcell and Kinnie, 2007). Implicit in these expectations is the basic idea that employees who are satisfied with their jobs are likely to be more committed to the organization and more productive (e.g. Hsu and Wang, 2008: Figure 1). It is therefore anticipated that organizations where the workforce is more satisfied will show higher levels of organizational commitment, less absenteeism and have a more productive workforce. These expectations can also be expressed at the workplace level, i.e.:

> *Hypothesis 1: There is a positive association between the level of job satisfaction in a workplace and the level of employee commitment in a workplace.*

Hypothesis 2: The association between the level of job satisfaction in a workplace and absenteeism is negative.

Hypothesis 3: There is a positive association between the level of job satisfaction in a workplace and its productivity.

Furthermore, an employee's job satisfaction can determine the failure or success of customer experiences (Hsu and Wang, 2008), has often been directly linked to customer satisfaction (e.g. Akdere, 2009), and a commitment to continuous improvement as well as quality (Matzler, Fuchs and Schubert, 2004). A critical factor for customer satisfaction is quality, thus:

Hypothesis 4: There is a positive association between the level of job satisfaction in a workplace and the quality of its product.

By contrast, the link between quality management and job satisfaction remains subject to debate and the empirical evidence is mixed, as discussed below.

2.2. Quality Management and Job Satisfaction

Besides addressing alternative ways that job satisfaction can affect employee behaviour, most of the employee satisfaction literature reports on how it is influenced by personal characteristics (Clark, 1997; Peccei and Lee, 2005), job level (Robie, Ryan, Schmieder, Parra and Smith, 1998), occupation (Rose, 2007), and education and wage levels (Clark and Oswald, 1996). Nonetheless, given that quality management initiatives in organizations change the nature of work, they may affect job satisfaction and different dimensions of quality management may differ in impact.

Dimensions of quality management and their impact on job satisfaction

The "most commonly cited dimensions of quality management in the literature" (Holzer, Charbonneau and Kim, 2009: 410–411; Molina-Azorin et al., 2009: 201) are: leadership, which is associated with top-level management's commitment to continuous improvements; planning or strategic management that is concerned with setting objectives and action plans for achieving set goals; process management and improvement, thus ensuring continuous efforts to design the

effective flow of work systems that helps eliminate inefficiencies; people management that emphasises the development of the workforce's capacity and aligns work with the objective of high quality; supplier management and collaboration; information management and analysis in order to monitor unexpected fluctuations and achieve consistent high quality through standardized evaluation processes; customer and market focus aimed at implementing the required standards.

This study is based on a national survey of British workplaces, which covers whether or not practices that are associated with most of these dimensions are implemented in the workplaces. The exceptions are leadership and supplier management collaboration. The survey is richer on human resource management practices and thus also provides the opportunity to investigate those that are directed at employee participation and are widely advocated as influential in both organizational performance and employee well-being (Humphrey, Nahrgang and Morgeson, 2007; Parker, Wall and Cordery, 2001; Womack et al., 1990).

Direct employee participation is key to human resource management (Guest, 1987) and common to theories that describe how HRM influences organizational performance (e.g. the mutual gains enterprise – Kochan and Osterman 1994, high involvement management – Lawler 1986, and high performance work organizations – Appelbaum et al. 2000; Capelli and Neumark 2001; Huselid 1995). Two types of direct participation are generally emphasized: (1) *job enrichment*, which is achieved by giving employees discretion, task variety and high levels of responsibility in their job; (2) *high involvement management*, which leads to the implementation of management practices that allow for organizational involvement beyond the job specification (e.g. teamwork, quality circles). According to these theories, both forms of employee participation enhance the quality of working life and thus would be positively associated with employee job satisfaction.

The common thesis underlying such expectations, based on which one might link job satisfaction to quality management, is that greater opportunities for problem solving and taking responsibility over one's work increase the intrinsic rewards of work. This thesis stems from the job redesign movement of the 1960s, which positively associated job autonomy with job satisfaction

and worker well-being. It is expressed in the job characteristics model of Hackman and Oldham (1976), which was one of the first attempts to relate the design of work to job satisfaction. There is indeed some empirical support for a positive association between employee participation in quality management and employee job satisfaction (e.g. Korunka et al., 2003, Mullarkey, Jackson and Parker, 1995). In addition, from a practical perspective, it is reasonable to expect that methods to reduce waste and increase efficiency also mean that work processes are better organized and consequently less stressful. Hence there is also suggestion that employees can be satisfied with very routine manufacturing jobs (e.g. Vidal, 2007) that do not require much involvement. Indeed this suggestion is consistent with Conti, Angelis, Cooper, Faragher and Gill's (2006) large empirical investigation of the link between lean production, an integrated system that encompassed the most cited dimensions of quality management through a range of practices previously defined by Fullerton, McWatters and Fawson. (2003: 389), and job stress. They concluded that "reduced lean control can provide workers with high utility benefits, and accompanying lower stress" (Conti et al., 2006: 1032). Consequently, higher levels of well-being and a "highly motivating work environment" (Adler and Cole, 1993: 86) have been linked to quality management for different reasons, and positive employee outcomes have also been confirmed (e.g. Adler and Cole, 1993; Jackson and Mullarkey, 2000; Mullarkey et al., 1995; Piercy and Rich, 2009).

By contrast, some authors argue that quality management, and more specifically an emphasis on process management, may result in job dissatisfaction. It has been suggested that the kind of teams associated with lean production systems may add to employees' job pressures since the strong supervision and evaluation systems may increase competition between workers (Wood, 1999). In this context, quality management initiatives have been criticized for not offering a supportive environment that might offset the effects of the drive for continuous improvement (Parker, 2003). An alternative negative view is that the multi-skilling advocated by quality management experts, which may lead to creative approaches, can actually result in variations of similar simple jobs with short training (Delbridge, Turnbull and Wilkinson, 1992; Parker, 2003) and

low job satisfaction (Vidal, 2007). Moreover, the increase in job demands from quality management that were observed in an early review of the evidence by Landsbergis et al. (1999) seems to be supported by more recent analyses, which concluded that total quality management and just-in-time procedures operate by "stepping up work intensity" to improve organizational efficiency (Green, 2006: 48).

Nonetheless, there are also arguments for an intermediate or neutral position, such as the "context-dependent approach" (Edwards, Collinson and Rees, 1998) or the acknowledgement of the heterogeneous impact of individual preferences for work arrangements (Vidal, 2007). From this intermediate point of view, neither generally positive (e.g. increase in job control and satisfaction) nor negative (e.g. increase in work effort, higher demands) employee effects should be expected. In fact, Korunka et al.'s (2003) study of the implementation of quality management in an organization, where outcomes were measured before the change and at different times during following the introduction, concluded that employee outcomes were context dependent. Still, they also identified job control, role clarity and information as key factors for job satisfaction.

All in all, we have no clear support for an association between quality management and job satisfaction and there are indications that any link may be affected by employee participation mechanisms. Given the scope and information on management practices that is offered by WERS2004, the present study attempts to empirically investigate the following:

Hypothesis 5: There is association between quality management and job satisfaction.

Hypothesis 6: The association between quality management and job satisfaction is influenced by job enrichment and high involvement management.

3. Research Design

3.1. Data

WERS2004 is the fifth in a series of surveys involving representative samples of workplaces across the British economy. Two of its instruments are used in the present study. The first is a survey of

workplace practices based on a face-to-face interview with a single respondent from within management, who was a senior manager at the workplace with day-to-day responsibility for industrial relations, employee relations or personnel matters. Interviews were conducted in 2,295 workplaces from an in-scope sample of 3,587 addresses, representing a response rate of 64%. The sample covers the private and public sector and all industries, with the establishments engaged in primary industries and private households with domestic staff (7% of all workplaces). Workplaces with fewer than five employees (60% of all workplaces) are excluded. The sample was taken from the Inter Departmental Business Register, maintained by the Office of National Statistics.

An eight-page, self-completion questionnaire is the survey's second instrument that is used. It was distributed within workplaces where WERS surveyors had conducted the management interview and led to a sample of 22,451 employees, equivalent to a response rate of 61%. The aim was to achieve a maximum of 25 employee respondents in each workplace. Employee questionnaires were distributed in 86% of the workplaces where the WERS surveyors had conducted the management interview. A further 12% of workplaces did not return any questionnaires, and in those workplaces with 10 or more employees these were treated (for purposes of the calculating the 61% response rate) as the same as those who had initially declined to distribute questionnaires. The median number of employees per workplace that completed the questionnaire was 13, and the most frequent (in 100 workplaces) was 16 employees.

The WERS2004 sample design involves many significant departures from the simple random sampling that underpins most standard statistical procedures (e.g. correlation and regression analysis). As a result, one must account for the sample design by applying weights to the data, if one wishes to obtain unbiased population estimates. Standard weights are included in the two datasets and are used in the analyses that follow.

3.2. Measures

Job Enrichment, High Involvement Management and Quality Management

Table 1 describes the management practices, whose measures are binary variables that are equal to one if a practice is used in the workplace and zero otherwise. The three job enrichment practices have been considered in previous studies of work enrichment (e.g. Parker and Wall, 1998) and cover the three dimensions of job autonomy described by Parker (2003). The definitions of quality and high involvement management practices are consistent with analyses of the WERS series (e.g. Wood and Bryson, 2009), although these excluded just-in-time procedures. Similar quality management practices have been considered in the literature (e.g. Kaynak, 2003; Douglas and Judge, 2001), though their measurements vary between studies.

Instead of creating an additive scale that counts the number of practices used, as for example in the study of White and Prybutok (2001), it is assumed that the correlation in practice uses stems from managerial approaches. Hence, by estimating the common factors in the practice data, these approaches can be measured. If a one-factor model would fit the correlation of all variables, there would be evidence of an integrated quality management that encompassed HRM, TQM and JIT. However, Chi-square tests showed that some practices were used independently of others, and the Spearman correlation coefficients (Appendix) illustrate that the association is weak or negligible between the three subsets. Hence, the three subsets of practices are considered separately.

Table 1

In order to develop the measurement constructs, methods specifically designed for binary data were required. The normit-probit latent trait model is used (Bartholomew and Knott, 1999: 79; Bartholomew, Steele, Moustaki and Galbraith, 2008: 213–216) to estimate latent variables (factors), which by construction are continuous and distributed as a standard normal. Yet there are no strong theoretical reasons to assume that a continuous factor underlies each subset of data. If a factor model does not fit the data, latent class models (Vermunt and Magidson, 2005: 21–22) are then estimated. Such models are traditionally used in social sciences to identify clusters with

the same measure of a categorical latent construct (McCutcheon, 1987) and have recently been applied in operations management (de Menezes, Wood and Gelade, 2010). As in cluster analysis, groups can be identified, but these follow from a statistical model and thus the quality of fit can be judged by standard statistical tests.

Job enrichment and *high involvement management* were found to be separate factors. Both latent trait models fitted the data and explained over 60% of the log-likelihood ratio statistic. In the model of job enrichment, the standardized coefficients that are akin to factor loadings in traditional factor analysis are: 0.99 (method control), 0.62 (task variety), 0.80 (timing control). The estimated probability that method control is used in the workplace with the mean level of job enrichment is equal to 0.001, and the most likely practice to be used in such a workplace is task variety (probability = 0.5). These estimated probabilities indicate that a job enrichment approach is not common in British workplaces, which is not surprising given the relatively low uses of the three practices (second column, rows 11 to 13 in the Appendix). With regards to the model of high involvement, the standardized factor loadings are: 0.71 (appraisal), 0.70 (functional flexibility), 0.84 (induction, information disclosure), 0.79 (quality circles), 0.65 (suggestion schemes), 0.87 (team briefing), 0.76 (teamwork), 0.73 (training HR skills). The lowest estimated probability that the average workplace, with respect to this measure, uses a high involvement practice is 0.30 (quality circles), and for three practices this probability is 0.90 or greater (induction, information disclosure and team briefing). Hence high involvement management is more widespread in British workplaces, which is also consistent with the higher observed frequencies of use of this type of practice (Appendix: second column, rows 14 to 23). In WERS2004, managers had also been asked to what extent individuals in the workplace were involved in decisions over how their work is organized, with responses on a four-point scale ("a little"–"a lot"). Both job enrichment (rho=0.45) and high involvement management (rho=0.16) were positively correlated with responses to this question, thus confirming that they measure employee participation but also suggesting different degrees and potentially different impacts.

In contrast to the two types of HRM practices, when the correlation structure of the quality management practices was examined, the association was generally weak (rows 1 to 10 – Appendix) and did not reflect continuous factors. Via latent class analysis, four different emphases in quality management were identified. The final model (Vermunt and Magidson, 2005: 21–22), whose estimated parameters are shown in Table 2, also implies some linear association between specific practices. The overall fit is good: the log-likelihood ratio statistic (L^2=1032; degrees of freedom=976) has a P-value of 0.1. According to the estimated likelihood of a practice being used in each class, the four categories of workplaces were named: No Quality Management, Some Targets, Some TQM and Some TQM+JIT. The second row in Table 2 shows the distribution of workplaces in the sample according to these categories. The corresponding population (weighted) distribution is 0.35 (No Quality Management), 0.18 (Some Targets), 0.23 (Some TQM) and 0.24 (Some TQM+JIT), thus showing that 35% of British workplaces are unlikely to have quality management. Three binary measures (dummy variables) are then used to indicate if a workplace belongs to each of the last three categories; the first category (No Quality Management) will be the reference or baseline in the investigation that is reported in the next sections.

Another question in the management survey asked: "To what extent would you say that the demand for your (main) product or service depends upon you offering better quality than your competitors?", with responses given in a five-point scale ("does not depend at all"–"depends heavily"). Cross-tabulations and Chi-square tests showed that belonging to the last two categories of workplaces (Some TQM: P-value=0.007; Some TQM+JIT: P-value=0.00) is associated with a perceived demand for better quality.

Table 2

Job Satisfaction and other outcomes

Job satisfaction is concerned with the extent of pleasure a person gains from their job and thus measures the degree of affective attachment to the job. In the employee survey, job satisfaction

was queried with respect to eight items on a five-point scale: the amount of influence the person has over their job, the amount of pay they received, the sense of achievement they get from their work, the scope for using initiative, the training the person received, their job security, involvement in decision making, and the work itself. Principle component analysis of these items indicated a single dimension, with the model explaining 50% of the variance. The factor loadings ranged from 0.82 to 0.51 and the three extrinsic items – satisfaction with training (0.63), pay (0.51) and security (0.56) – had lower loadings than the intrinsic ones. Job satisfaction is measured by the mean scores on all eight items, but when five or more of these items were missing, the measure is coded as missing. The scale has a reliability statistic, as measured by Cronbach's alpha, of 0.85, which is consistent with measures from 29 studies of job satisfaction overviewed by Mullarkey, Wall, Warr, Clegg and Stride (1999: 63 – Cronbach's alpha varied from 0.85 to 0.93 with a mean of 0.88), although individual items vary between studies. When the level of job satisfaction in a workplace is considered in the analysis that follows, it is estimated by the weighted average of the responses of employees in each workplace.

Organizational *commitment* is measured by a scale computed as the average response to three items (Cronbach's alpha = 0.85) that are coded on a five-point scale in the employee survey: "I share many values of my organisation", "I feel loyal to my organisation", "I am proud to tell people who I work for". The level of commitment in a workplace is therefore measured by the weighted average of this scale in each workplace.

Labour *productivity* and *quality* are performance measures that rely on subjective assessments of the managerial respondent in each workplace. They are ordinal variables measured as five-point scales that range from "a lot below average" to "a lot better than average for industry".

Absenteeism in WERS2004 is measured by the percentage of work days lost through employee sickness or absence, and is available for every workplace. However, the distribution of this measure is highly skewed and thus its logarithm was computed, and also adjusted in the case of the few workplaces that had zero percentage so that their information would not be lost by re-scaling the data.

Controls

Control variables are constructed from both surveys. These are independent variables that were found to be associated with either the use of management practices or job satisfaction. At the workplace level they are: union density, size of establishment (logarithm of the total number of employees), industry group (11 dummy variables; manufacturing is the reference group), public workplace, years operating at present address, proportion of females, proportion of operational and routine workers, proportion of young workers (employees aged 21 or below), proportion of part-time workers and proportion of new recruits (workers that commenced work in the past 12 months). Individual characteristics that have been found to be associated with job satisfaction are added when employee satisfaction is the dependent variable. These are: being a manager, age (measured as a categorical variable, since non-linear relationships with measures of well-being were argued in the literature: Blanchflower and Oswald, 2008), being educated up to a graduate level, gender, tenure and low earnings (wage).

3.4. Statistical Analysis

In order to test for Hypotheses 1 to 4, weighted regression models on workplace data are estimated. These are ordered-logit regression models where the dependent variable is an ordinal performance outcome; otherwise, weighted least squares are used. The establishment weight that is provided in WERS2004 is the weighting variable and the models are estimated using Stata (svyologit, svyregress). A few workplaces had less than three employee respondents and were identified as outliers, so they are excluded from the analysis.

Weighted hierarchical two-level regression models are used to investigate the Hypotheses 5 and 6. Employee satisfaction is the dependent variable, which is measured at the individual level. The independent variables are the quality management categories, job enrichment and high involvement management, which are measured at the workplace level. The controls are measured at both levels as previously described. Both employee and establishment weights are used.

4. Results

Table 3 summarizes the in-sample bivariate association between quality management, job enrichment, high involvement management, employee and workplace performance outcomes at the workplace level. It clearly suggests a strong positive association between the levels of job satisfaction and organizational commitment (rho=0.74) in the workplaces and significant associations between job satisfaction and other desired outcomes. The last two rows refer to employees' perceptions also available in the dataset, which enable us to gain more insights and will be discussed in the next section. It is noticeable that job satisfaction is positively associated with the employee's perceptions of job control (rho= 0.44), although they are only weakly associated with job enrichment (rho=0.16) and negatively associated with having an approach that integrates some total quality management and just-in-time procedures (TQM+JIT: rho=-0.11). Not surprisingly, there is negative correlation between having no quality management and having some integration of total quality management and just-in-time procedures (rho=-0.41). Yet, there is also negative correlation between having some integration of TQM and JIT and just having some TQM (rho=-0.45) which might reflect the lower use of JIT. Overall correlations are not strong (absolute values < 0.2).

Table 3

Table 4 summarizes the potential impact of the level of job satisfaction in the workplace on the level of organizational commitment, absenteeism, productivity and quality. A positive association with organizational commitment, productivity and quality, plus a negative association with absenteeism, are highlighted. These results support Hypotheses 1 to 4, thus confirming that job satisfaction is not only important in its own right, but may also influence the links between quality management strategies and performance or other desired employee outcomes.

Table 4

When hierarchical two-level models are estimated, the first model to consider is what is known as the null model. It essentially estimates the mean job satisfaction in the population (employees in British workplaces) and the residual variances, based on which the intra-class correlation is calculated and can be interpreted as the proportion of the total residual variance that is due to differences between workplaces. The estimated mean is equal to 3.48 with a standard error of 0.008 and is significantly greater than 3, thus indicating that the average employee in British workplaces is satisfied with their job. The intra-class correlation is equal to 15.55%, which is not negligible and shows that between-workplace variation should be considered as well as individual (employee) variability when attempting to predict employee job satisfaction in this data. In other words, two-level models are appropriate for investigating Hypotheses 5 and 6, and thus were estimated.

Table 5

Table 5 shows the estimated coefficients and their respective standard errors. Significant coefficients are highlighted in bold. According to the second column, job satisfaction is positively associated with being a manager, being over sixty, and the proportion of part-time workers. By contrast, it is negatively associated with being university educated, male, job tenure, low earnings, the size of the workplace and its amount of unionization. Employees in public workplaces are less satisfied with their jobs than those in private and public–private partnerships. In relation to working in manufacturing, those working in financial services are less satisfied with their jobs, while those working in the construction industry, public administration, education, health and other community services are more satisfied with their jobs. Finally, quality management is not associated with employee job satisfaction.

Adding high involvement management and job enrichment to the model, as shown in columns four and five, does not change the significance of the observed predictors. High

involvement management is not associated with job satisfaction, but job enrichment is positively associated with it. Interactions of the quality management categories with both job enrichment and high involvement management were added to this model, but those with high involvement management were not significant and thus were deleted. Results are shown in column six: while job enrichment is positively associated with job satisfaction, the combination of total quality management and job enrichment is negatively associated with job satisfaction and may dilute the positive effect of job enrichment. In conclusion, Hypotheses 5 and 6 were rejected and there is evidence that total quality management may influence the link between job enrichment and employee job satisfaction.

5. Discussion and Further Analysis

That job satisfaction is positively linked to desired employee and organizational outcomes is confirmed by the results of the present study. As for quality management, most workplaces in Britain in 2004 were unlikely to adopt some basic operational features of quality management, so only a few could benefit from its potential gains. No link with job satisfaction was found. Yet a weak negative association between a workplace having some integration of TQM and JIT procedures and the perception of job control can be observed, and there is little evidence of an association between quality management and work intensification (Table 3). Further analysis, via a regression model where the perceived job demand in the workplace was the dependent variable, the quality management dummy variables were the independent variable and the same controls as in Table 4 were kept, showed a positive association between having some integration of TQM and JIT (P-value=0.004) and perceived job demands. Overall, however, there is no evidence that this resulted in job dissatisfaction or that the monitoring aspects of total quality management were associated with higher perception of job demands (P-value=0.415).

The link between job enrichment and job satisfaction was confirmed. It is worth noticing that Table 3 also shows a weak association between management's approach towards job enrichment, which is the subject of this investigation, with the average employee's perception of job control

(rho=0.16). This may indicate that informal empowerment mechanisms were present in the workplaces or that a significant role in enriching jobs might be played by direct supervisors. In order to obtain some sensitivity of the results, an alternative model to that described in column three of Table 5, where job enrichment was replaced by the employees' perception of job control, was then estimated. As one might have expected, the association with job satisfaction is stronger (P-value=0.00), thus suggesting that the perception of job control may be what really matters for an employee's job satisfaction. It is likely that job satisfaction will mediate the link between job enrichment or job control and desired organizational outcomes and these relationships should be investigated in future studies on the potential effects of direct employee participation.

Similar to quality management, no association between high involvement management and job satisfaction was found. The former is moderately associated with some integration of TQM and JIT (Table 3, column four: rho=0.35), and is also weakly associated with higher perceived job demands (Table 3, column six: rho=0.18). Nonetheless, as reported in the previous section, the combination of high involvement management and some quality management does not appear to result in job dissatisfaction as forecast by studies that associate work intensification with these forms of managements, either alone or as components of a high performance work system.

That some emphasis on TQM combined with job enrichment may be linked to job dissatisfaction, while there is no similar link when TQM is coupled with JIT procedures, is an issue for further investigation. It could be due to having the monitoring aspects coupled with extra responsibilities for quality management but lacking tools for effective process management. However, the lack of detail in the current dataset does not permit further analysis.

It may be that employees' preferences are significant in any potential link between quality management approaches and employee job satisfaction, as observed in case studies (e.g. Vidal, 2007). Yet preferences are very heterogeneous and thus their effects are likely to dilute in large samples of employees. It is therefore plausible that the negative employee reactions to quality management observed in case-studies are less likely to be observed in a wider context, thus

favouring the intermediate view of no association. Large sample longitudinal studies of organizations and their employees with more detailed measures on implementation are therefore needed in order to further clarify the ongoing debate on the human issues in quality management.

6. Conclusion

This study uses a large economy-wide sample and is distinctive for its use of matched workplace and employee data. It confirms the importance of job satisfaction for both employee and organizational outcomes, since positive links with organizational commitment, productivity and quality were observed thus confirming Hypotheses 1 to 4. Yet it does not support expectations that quality and high involvement managements may lead to higher organizational performance but decrease employee job satisfaction. On average, employees in British workplaces in 2004 were satisfied with their jobs, but there was no association between quality management and job satisfaction. Consequently, the findings of this study reject Hypotheses 5 and 6 and support an intermediate view that, broadly, there is no link between quality management and job satisfaction.

A limitation of this study is the restricted coverage of quality management practices, most noticeably the absences of measures of a learning culture, leadership commitment to quality, and supply chain partnership. The data also rely on a single manager's assessments of the performance of the workplace which, as shown by Mezias and Starbuck (2003), may be inaccurate and require special attention. The consistency of the subjective performance measures in WERS2004 was investigated by Forth and McNabb(2008) on subsets of the sample, for which objective measures were available ($n \leq 506$ out of $N=2295$). They found overlaps in the distributions of the four objective measures of productivity within each category of the subjective rating, which is a reason for caution. Yet they also found evidence of congruence and qualified support for the hypothesis that both types of productivity measures produce similar results (identical signed associations) when used in structural models of workplace performance (on the same data). Their overall conclusion echoes previous findings that managers' ratings of performance in the UK were consistent with

audited accounting data (Wall, Michie, Patterson, Sheehan, Wood, Clegg and West, 2004), thus giving us some confidence in using the subjective assessments. Moreover, this study was unable to assess the extent of implementation of practices that might have led to further discrimination of workplaces with regards to their managerial approaches. Finally, this is a cross-sectional study and thus neither causality nor long term effects are assessed.

All in all, the current study adds economy-wide evidence to an ongoing debate on the potential employee and organizational outcomes of quality management approaches, and supports the thesis that job enrichment features are important for an effective quality management.

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Table 1: Definition of the Indicators of the Use of Management Practices in the Workplaces in the Study*

	JOB ENRICHMENT
Method Control	Equal to 1 if employees in the largest occupational group have a lot of discretion over how they do their work.
Timing Control	Equal to 1 if employees in the largest occupational group have a lot of control over the pace at which they carry out their work.
Task Variety	Equal to 1 if employees in the largest occupational group have a lot of variety in their work.
	HIGH INVOLVEMENT MANAGEMENT
Appraisal	Equal to 1 if non-managers in the workplace have their performance formally appraised.
Functional Flexibility	Equal to 1 if a larger than the average proportion of the core occupational group is formally trained to be able to do jobs other than their own.
Induction	Equal to 1 if there is a standard induction programme to new employees within the largest occupational group.
Information Disclosure	Equal to 1 if regular information is provided on one or more of the following: the financial position of the establishment, internal investment plans, staffing plans.
Quality Circles	Equal to 1 if groups of employees solve specific problems or discuss aspects of performance or quality, which are sometimes known as quality circles, or problem-solving or continuous improvement groups.
Suggestion Schemes	Equal to 1 if management uses suggestion schemes to consult with employees.
Teamwork	Equal to 1 if more than the average proportion of the core occupational group work in formally designated teams.
Team Briefing	Equal to 1 if team briefing for all the workers in a section is available.
Training for Human Relations Skills	Equal to 1 if employees in the largest occupational group received off-the-job training on improving communication and/or teamwork in the past year.
	QUALITY MANAGEMENT
Just-in-time	Equal to 1 if a system to minimize inventories, supplies or work-in-progress is in place.
Customer Service Targets	Equal to 1 if targets for customer service are set.
Customer Surveys	Equal to 1 if quality is monitored via customer surveys.
Quality Records	Equal to 1 if quality records are kept.
Quality Targets	Equal to 1 if targets for quality of product or service are set.
Records on Faults and Complaints	Equal to 1 if quality is monitored by keeping records on levels of faults and complaints.
Self-inspection	Equal to 1 if individual employees monitor quality.
Team Briefings involve Quality	Equal to 1 if there is a system of briefing for any section or sections of the workforce that discusses quality of products/services (production issues).
Training in Quality	Equal to 1 if employees in the largest occupational group received off-the-job training on quality procedures in the past year.
Training in Problem Solving	Equal to 1 if employees in the largest occupational group received off-the-job training on problem solving in the past year.

* All are equal to zero otherwise.

Table 2: The Latent Class Model of Quality Management Practices – Estimated Parameters*

Class**	1	2	3	4
	Probability of using a practice if in the class			
Just-in-time (JIT)	0.09	0.16	0.17	0.59
Training in quality	0.07	0.15	0.21	0.57
Training in problem solving	0.10	0.15	0.21	0.53
Self-inspection	0.08	0.07	0.27	0.58
Records on faults and complaints	0.04	0.07	0.30	0.59
Quality records	0.08	0.21	0.16	0.55
Customer surveys	0.04	0.08	0.28	0.60
Quality targets	0.01	0.28	0.07	0.63
Customer service targets	0.03	0.24	0.11	0.62
Team briefing involves quality	0.10	0.15	0.21	0.53

* Estimates are based on WERS2004 workplace sample, cases with missing values are excluded from the analysis: N=2219.
** 1= No Quality Management; 2= Some Targets; 3= Some TQM; 4= Some TQM-JIT.
Estimated Direct Effects and P-values in brackets: Customer surveys and JIT: -0.46 (0.003); Customer surveys and Quality targets: 1.07 (0.00); Training in problem solving and Training in quality: 0.81 (0.00); Quality targets and JIT: 0.35 (0.00).

Table 3: Workplace-level Spearman Correlations

	1	2	3	4	5	6	7	8	9	10	11	12
1. No Quality Management	1.00											
2. Some Targets	-0.22	1.00										
3. Some TQM	-0.28	-0.24	1.00									
4. Some TQM+JIT	-0.41	-0.36	-0.45	1.00								
5. Job Enrichment	0.08	-0.01	-0.02	-0.04	1.00							
6. High Involvement Management	-0.37	-0.02	-0.04	0.35	0.00	1.00						
7. Job Satisfaction	0.15	0.00	0.00	-0.12	0.17	-0.15	1.00					
8. Organizational Commitment	0.09	0.01	-0.02	-0.06	0.17	-0.05	0.74	1.00				
9. Absenteeism	-0.17	0.02	-0.02	0.14	-0.13	0.16	-0.22	-0.17	1.00			
10. Productivity	-0.01	0.07	-0.05	0.00	0.13	0.05	0.15	0.14	-0.11	1.00		
11. Quality	-0.01	-0.01	-0.04	0.04	0.12	0.02	0.15	0.17	-0.07	0.36	1.00	
12. Perceived Job Demand*	-0.10	0.03	0.01	0.06	0.13	0.18	-0.04	0.10	0.05	-0.02	-0.03	1.00
13. Perceived Job Control**	0.11	0.00	0.02	-0.11	0.16	-0.05	0.44	0.34	-0.18	0.09	0.06	0.09

***** Mean per workplace of employees' responses to two questions (five-point scale from strongly agree to strongly disagree) with the statements: "my job requires that I work very hard", "I never seem to have enough time to get my work done".

** Mean per workplace of an employee-level five-item measure (Cronbach's $\alpha = 0.81$) based on their responses ("A lot", "Some", "A little", "None") of how much influence they have over five areas of work: "the tasks they do in their job", "the pace at which they work", "how they do their work", "the order in which they carry out their tasks", "the time they start or finish their work".

Table 4: Potential Impact of Job Satisfaction – Regression Coefficients and P-values

	Commitment*	Absenteeism*	Productivity**	Quality**
Level of job satisfaction	**0.90 (0.000)**	**-0.35 (0.013)**	**0.93 (0.008)**	**0.98 (0.001)**
Size of establishment	-0.02 (0.483)	0.27 (0.003)	-0.42 (0.838)	0.20 (0.232)
Manufacturing (reference category)				
Electricity, gas and water	-0.09 (0.225)	-0.27 (0.051)	-0.11 (0.862)	-0.42 (0.660)
Construction	0.15 (0.091)	0.06 (0.843)	-0.36 (0.433)	-0.41 (0.463)
Wholesale and retail	0.09 (0.146)	0.29 (0.093)	-0.10 (0.816)	-0.40 (0.299)
Hotels and restaurants	0.21 (0.025)	0.33 (0.238)	0.86 (0.159)	0.04 (0.941)
Transport and communication	0.15 (0.081)	0.34 (0.111)	0.56 (0.237)	-0.45 (0.313)
Financial services	0.13 (0.273)	0.21 (0.384)	0.42 (0.478)	-0.09 (0.888)
Other business services	0.10 (0.137)	0.10 (0.501)	0.50 (0.249)	0.27 (0.469)
Public administration	-0.16 (0.085)	-0.17 (0.638)	0.37 (0.686)	-1.23 (0.032)
Education	0.35 (0.000)	0.32 (0.099)	0.20 (0.973)	-0.025 (0.961)
Health	0.10 (0.185)	0.49 (0.008)	0.43 (0.335)	0.22 (0.655)
Other community services	0.15 (0.065)	0.13 (0.599)	0.99 (0.052)	-0.15 (0.745)
Public workplace	-0.02 (0.771)	0.02 (0.882)	0.26 (0.489)	-0.59 (0.080)
Age of workplace	-0.002 (0.85)	-0.03 (0.201)	0.23 (0.689)	-0.06 (0.240)
Proportion females	0.06 (0.456)	0.14 (0.536)	-0.56 (0.197)	-0.08 (0.849)
Proportion routine workers	-0.06 (0.388)	0.14 (0.497)	-0.27 (0.599)	0.11 (0.761)
Proportion young workers	-0.19 (0.033)	0.27 (0.289)	-0.36 (0.739)	0.91 (0.242)
Proportion part-time workers	-0.10 (0.168)	-0.46 (0.032)	-0.51 (0.317)	-0.76 (0.110)
Proportion new recruits	-0.04 (0.534)	0.25 (0.083)	0.38 (0.390)	0.18 (0.702)
Union density	0.02 (0.810)	0.43 (0.002)	-0.43 (0.008)	0.28 (0.422)
R-Squared	0.58	0.15		
F	F(21,1292)=35.6	F(21,1089)=3.05	F(21,1128)=1.72	F(21,1212)=2.39
Prob >F	0.00	0.00	0.02	0.00
N	1313	1110	1149	1233

* Estimates based on weighted least squares.
** Estimates base on weighted ordered-logit models.

Table 5: Two-Level Models of Job Satisfaction

	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
Constant	**3.68**	0.08	**3.64**	0.08	**3.63**	0.08
Potential Predictors						
Some TQM+JIT	-0.03	0.02	-0.02	0.03	-0.01	0.03
Some Targets	-0.01	0.03	0.00	0.03	0.01	0.03
Some TQM	-0.04	0.03	-0.03	0.03	-0.03	0.03
Manager	**0.30**	0.02	**0.30**	0.02	**0.30**	0.02
University educated	**-0.06**	0.02	**-0.06**	0.02	**-0.06**	0.02
Male	**-0.08**	0.02	**-0.08**	0.02	**-0.08**	0.02
Aged 18–19	0.04	0.07	0.05	0.07	0.05	0.07
Aged 20–21	-0.03	0.06	-0.03	0.06	-0.03	0.06
Aged 22–29	-0.03	0.06	-0.03	0.06	-0.03	0.06
Aged 30–39	0.02	0.06	0.03	0.06	0.03	0.06
Aged 40–49	0.00	0.06	0.00	0.06	0.00	0.06
Aged 50–59	0.05	0.06	0.05	0.06	0.05	0.06
Aged 60–64	**0.22**	0.06	**0.22**	0.06	**0.22**	0.06
Aged 65+	**0.38**	0.08	**0.38**	0.08	**0.38**	0.08
Tenure 1–2 years	**-0.07**	0.02	**-0.07**	0.02	**-0.07**	0.02
Tenure 2–5 years	**-0.09**	0.02	**-0.09**	0.02	**-0.09**	0.02
Tenure 5–10 years	**-0.09**	0.02	**-0.09**	0.02	**-0.09**	0.02
Tenure 10+ years	**-0.09**	0.02	**-0.09**	0.02	**-0.09**	0.02
Low earnings (<=4.5£/h)	**-0.06**	0.02	**-0.06**	0.02	**-0.06**	0.02
Size – log(total of employees)	**-0.06**	0.01	**-0.06**	0.01	**-0.06**	0.01
Electricity, gas and water	0.06	0.07	**0.08**	0.07	0.07	0.07
Construction	**0.16**	0.04	**0.16**	0.04	**0.16**	0.04
Wholesale and retail	0.06	0.03	0.06	0.03	**0.07**	0.03
Hotels and restaurants	0.11	0.07	0.11	0.07	0.11	0.07
Transport and communication	-0.02	0.04	-0.02	0.04	-0.02	0.04
Financial services	**-0.08**	0.04	-0.07	0.04	-0.07	0.04
Other business services	0.04	0.04	0.04	0.04	0.05	0.04
Public administration	**0.12**	0.05	**0.13**	0.05	**0.13**	0.05
Education	**0.30**	0.04	**0.29**	0.04	**0.29**	0.04
Health	**0.26**	0.04	**0.25**	0.04	**0.26**	0.04
Other community services	**0.15**	0.04	**0.15**	0.04	**0.15**	0.04
Public workplace	**-0.07**	0.03	**-0.07**	0.03	**-0.06**	0.03
Age of workplace	0.00	0.01	0.00	0.01	0.00	0.01
Proportion females	-0.07	0.05	-0.06	0.05	-0.06	0.05
Proportion routine workers	-0.02	0.04	-0.02	0.04	-0.02	0.04
Proportion young workers	-0.10	0.08	-0.09	0.08	-0.08	0.08
Proportion part-time workers	**0.18**	0.05	**0.18**	0.05	**0.17**	0.05
Proportion new recruits	-0.03	0.05	-0.02	0.05	-0.03	0.05
Union density	**-0.18**	0.03	**-0.17**	0.03	**-0.18**	0.03
High involvement management			-0.01	0.01	-0.01	0.01
Job enrichment			**0.03**	0.01	**0.07**	0.02
Some TQM+JIT x Job enrichment					-0.05	0.03
Some Target x Job enrichment					-0.05	0.04
Some TQM x Job enrichment					**-0.08**	0.03
Fit Summary						
Workplace Residual Variance	0.05	0.00	0.05	0.003	0.05	0.003
Employee Residual Variance	0.39	0.01	0.38	0.006	0.38	0.006
-2Log-likelihood	36923		36914		36908	
Number of Cases	16778		16778		16778	

Appendix: Weighted Frequencies of Practice Uses and Spearman Correlation Coefficients (N=2295)

	Use (%)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	21.9	1																						
2	26.6	0.12	1																					
3	15.6	0.01	0.21	1																				
4	38.7	0.13	0.15	0.12	1																			
5	46.6	0.16	0.20	0.08	0.35	1																		
6	52.7	0.16	0.19	0.10	0.15	0.23	1																	
7	41.5	0.08	0.18	0.12	0.26	0.45	0.27	1																
8	41.8	0.17	0.20	0.12	0.16	0.25	0.46	0.25	1															
9	33.8	0.18	0.16	0.10	0.13	0.21	0.28	0.32	0.43	1														
10	26.0	0.14	0.15	0.12	0.15	0.20	0.20	0.20	0.22	0.14	1													
11	48.4	-0.11	0.03	0.11	-0.01	-0.07	-0.02	0.02	-0.02	-0.04	-0.04	1												
12	28.0	-0.08	-0.03	0.04	0.01	-0.12	-0.01	-0.05	-0.04	-0.06	-0.07	0.26	1											
13	25.0	-0.04	-0.01	0.02	0.01	-0.03	-0.02	0.00	-0.03	-0.01	-0.05	0.14	0.38	1										
14	41.3	0.09	0.18	0.12	0.07	0.16	0.13	0.10	0.14	0.14	0.19	-0.04	-0.05	-0.01	1									
15	47.0	0.04	0.10	0.09	0.11	0.11	0.11	0.15	0.16	0.08	0.26	0.08	0.00	-0.01	0.13	1								
16	60.4	0.10	0.12	0.14	0.11	0.19	0.16	0.21	0.20	0.15	0.71	-0.02	-0.06	-0.07	0.18	0.31	1							
17	26.0	0.12	0.13	0.13	0.09	0.17	0.18	0.19	0.17	0.15	0.18	-0.01	-0.07	-0.04	0.15	0.13	0.17	1						
18	17.3	0.15	0.20	0.17	0.18	0.17	0.18	0.18	0.21	0.13	0.21	0.03	0.00	-0.01	0.19	0.22	0.23	0.13	1					
19	77.8	0.06	0.14	0.09	0.07	0.22	0.16	0.20	0.19	0.16	0.19	0.01	-0.05	-0.03	0.22	0.15	0.22	0.15	0.15	1				
20	40.9	-0.03	0.23	0.36	0.09	0.13	0.11	0.17	0.14	0.12	0.17	0.12	0.00	-0.02	0.17	0.19	0.21	0.16	0.19	0.18	1			
21	78.2	0.04	0.12	0.15	0.11	0.14	0.13	0.18	0.17	0.14	0.20	0.10	0.04	0.00	0.19	0.20	0.23	0.15	0.20	0.20	0.21	1		
22	55.9	0.00	0.07	0.08	0.03	0.07	0.09	0.15	0.12	0.12	0.17	0.06	-0.02	-0.05	0.13	0.19	0.21	0.18	0.13	0.22	0.19	0.21	1	
23	28.7	0.04	0.11	0.12	0.12	0.19	0.15	0.27	0.21	0.21	0.22	0.02	-0.04	-0.03	0.19	0.21	0.26	0.25	0.24	0.23	0.22	0.27	0.25	1

1. JIT; 2. Training in quality; 3. Training problem solving; 4. Self-inspection; 5. Records faults and complaints; 6. Quality records; 7. Customer surveys; 8. Quality targets; 9. Customer/ service targets; 10. Team briefings on quality; 11. Task variety; 12. Method control; 13. Timing Control; 14. Functional flexibility; 15. Teamworking; 16. Team briefing; 17. Suggestion schemes; 18. Quality circles; 19. Induction; 20. Training for HR skills; 21. Information disclosure; 22. Appraisal; 23. Survey feedback method