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Managing Performance in Quality Management: a two-level study of employee-perceptions and workplace-performance

Abstract

Purpose: This paper addresses potential effects of the control element in Quality Management. First, behavioural theories on how elements of performance management can affect organisational performance are examined. Secondly, theoretical models on how perceptions of work conditions may impact wellbeing and performance are considered. Direct and indirect pathways from performance management to productivity/quality are inferred.

Methodology: Matched employee-workplace data from an economy-wide survey in Britain and two-level structural equation models are used to test the hypothesised associations.

Findings: The use of practices in workplaces is inconsistent with a unified performance management approach. Distinct outcomes are expected from separate components in performance management and some may be contingent on workplace size. For example, within Quality-planning, strategy dissemination is positively associated with workplace-productivity; targets are negatively associated with perceptions of job demands and positively correlated with job satisfaction, which in turn can increase workplace-productivity. With respect to Information & Analysis: keeping and analysing records, or monitoring employee-performance via appraisals that assess training needs, are positively associated with workplace-productivity and quality.

Originality: This paper illustrates how control in Quality Management can be effective. Although the merits of performance management are subject to ongoing debate, arguments in the literature have tended to focus on performance appraisal. Analyses of economy-wide data linking performance management practices, within Quality Management, to employee-perceptions of work conditions, wellbeing and aggregate performance are rare.

Keywords: Quality Management, performance management, Quality-planning, Information & Analysis, employee-perceptions of work conditions, productivity, quality.

Article classification: Research paper.

1. Introduction

Although for over thirty years management scholars have been striving to understand performance differentials between organisations, there is some consensus that management practices explain a share of observed variations in performance (Bloom et al., 2016, Nisar et al., 2019). Bromiley and Rau (2014, 2016) argued that managers replicate practices or activities that are perceived to be successful and amenable to transfer between organisations. Unsurprisingly, across the globe, as organisations attempt to address performance gaps, business excellence models and improvement initiatives are implemented. Quality management practices are now part of the daily routine in most organisations. Yet, while some practices have been found to be directly associated with performance, others are thought to be mediated through employee-decision making and effort (Bender et al., 2018). In this context, how to efficiently manage performance remains a key question which has implications for management, employees, and societies.

From an operations management perspective, performance management translates the organisational strategy into the reality of work units and ultimately to the employee (Melnyk et al., 2004, Franco et al., 2012). Disseminating the organisational strategy, setting targets and monitoring are means to engage the workforce with strategic objectives and encourage problem-solving attitudes for learning and continuous improvement (e.g. Neely, 2005; Prajogo and McDermott, 2005; Franco et al., 2007; Bourne et al., 2013; Koufteros et al., 2014). Together, these practices are core to any improvement initiative and reflect two main stages in

the Quality Management cycle: Quality-planning and Information & Analysis (Mellat-Parast et al., 2011; Laosirihongthong et al., 2013). Performance management systems are therefore required to support continuous improvement (DeNisi and Murphy, 2017) and, ideally, ensure that all subsystems in an organisation work optimally towards the desired goals (Biron et al., 2011).

Several scholars have described how Quality Management underscores the use of a process-based performance management system. In particular, Linderman et al. (2003) explained the importance of setting and achieving targets in Six-Sigma: set goals are means to motivate workforce participation in learning activities and to develop behaviours that lead to sustainable improvements. Nevertheless, as Soltani and Wilkinson (2018) observed, reviews of the extant literature on Quality Management and, specifically on managing performance in organisations, imply that the effects of performance management on individual workers and organisational performance are unknown. Mixed findings have been reported and, in fact, performance management remains the most controversial aspect of Quality Management.

Performance management is broadly defined as a regular process of identifying, measuring and developing performance of the workforce in alignment with strategic objectives (Aguinis, 2013). This process-based approach has often been portrayed as a managerial style that seeks to maximise employee-contribution via strict control and greater demands, which negatively affects wellbeing (Sprigg and Jackson, 2006; Soltani et al., 2008; Franco and Doherty, 2017). Statements that performance management practices can be counterproductive are not new, neither in management thinking nor within Quality Management. For a start, Deming (1986) argued against performance metrics and appraisals, in his view, these practices were even detrimental to continuous improvement. Later, several authors (e.g. Duncan and Van Martre, 1990; Linderman et al., 2006) counter argued that Deming's conclusions were at odds with the

evidence from research on motivation and signalling, which demonstrates the importance of setting goals for performance at different levels in organisations.

Recent publications not only underline a renewed interest in performance management (e.g. Capelli and Tavis, 2016; Pichler et al., 2018), but also provide further insights into this debate, by highlighting limitations of the accumulated evidence on outcomes from performance management. Within Human Resource Management (Tweedie et al., 2019) and Psychology (DeNisi and Murphy, 2017), comprehensive literature reviews demonstrate that out of various practices underlying performance management, the focus has been on employee-performance appraisals. Accordingly, it is mostly the role and variations in the design of a single practice for employee-performance that have been subject to scrutiny. Studies have tended to examine employee-performance, rather than at higher levels, and much of what is known about potential effects of performance management practices follows from theories of individual-behaviour applied to a small number of organisations. Consequently, large empirical studies on how performance management practices may impact aggregate performance and different dimensions of employee-wellbeing are needed (Soltani and Wilkinson, 2018). Within Operations Management, it is also important to remind ourselves that management practices can affect perceptions of working conditions and employee-attitudes, which can influence performance at the group-level (Ukko et al., 2007; de Leeuw and van den Berg, 2011; Saunila et al., 2014). Considering that awareness of organisational objectives and key performance indicators can enable a better understanding of targets and prompt the desired responses from employees (Ketokivi and Castaner, 2004), it may not be surprising that performance management has also been linked to improvements in employee job satisfaction (e.g. Opstrup and Pihl-Thingvad, 2018). This is important since, at various levels of analysis, job satisfaction has been positively associated with performance (Bryson et al., 2017).

Given conflicting observations on the effects of performance management, there may be direct and indirect pathways to performance. The present study takes inspiration from research on how employees' perceptions of management practices can affect employee-wellbeing and/or organisational performance, and on how models that address interpretations of work conditions (e.g. Bakker and Demerouti, 2017) can be applied in a management context. Thus, considering that employees interpret management practices as work conditions and react to these perceptions, different pathways to performance in workplaces are hypothesised. The focus is on how performance management may lead to different reactions from employees and, ultimately, may impact aggregate performance. Two-level structural equation models are developed in order to empirically test direct and indirect links. Following recent literature on outcomes of management practices (e.g. Wood and Ogbonnaya, 2018), the workplace-level is taken as the higher-unit of analysis. Since implementations of policies can vary between different sites within an organisation, the workplace-level is appropriate to observe and measure management practices (Gerhart et al., 2000).

The present study adds to the understanding of the management-practices performance nexus, and helps to clarify potential implications of the most controversial element in Quality Management, which is performance management. The next section describes the background and theoretical perspectives that lead to the hypotheses and conceptual model to be tested. The empirical study is reported in section 3. Results are presented in section 4 and implications are discussed in section 5, thus leading to the conclusions.

2. Background and Hypotheses

2.1. Performance Management in Quality Management

For decades, scholars and practitioners have attempted to identify success factors in Quality Management (e.g., Hietschold et al., 2014). Among key factors, Quality-planning (developing

strategic objectives into action plans, setting targets to be achieved by the improvement effort, and communicating strategic directions or priorities) and Information & Analysis (monitoring of performance against targets to ensure progress and to continually identify areas for improvement) are inherent to any improvement initiative. Unsurprisingly, they are reflected in the criteria for quality-certifications and awards (e.g., EFQM Excellence Model, Malcolm Baldrige National Quality Award), and are implicit in definitions of performance management (e.g. Biron et al., 2011). Indeed, most empirical studies of Quality Management and performance have considered Quality-planning and Information & Analysis, while specifying sets of practices presumed to enable performance (e.g. Ebrahimi and Sadeghi, 2013; Laosirihongthong et al., 2013). According to Prajogo and McDermot (2005: 1115), Quality-planning and Information & Analysis "reflect well the beginning (planning) and ending (evaluation) phases of strategic management processes". In summary, from a Quality Management perspective, performance management is about decision-making based on facts, how objectives and action plans are developed and deployed, and how data is assessed to monitor progress and drive improvements (Mellat-Parast et al., 2011; Hietschold et al., 2014). Accordingly, Table 1 defines performance management in the context of this study.

Table 1

2.2. Pathways from Performance Management to Performance

Quality Management relies on the expectation of learning, dissemination, and replication of good practice. People want to know where they stand, and thus an organisation's ability to disseminate its strategy and orchestrate its resources, as implied in Quality-planning, is fundamental in pursuit of better performance. Scholars (Koufteros et al., 2014; Pavlov et al., 2017) have argued that the Resource Orchestration Theory (Sirmon et al., 2007; Hitt et al., 2011), which addresses how managers can facilitate efforts to effectively manage their

organisation's resources, implies that feedback from performance management is critical not only for improvements at employee-level, but also for the leadership to adapt and mobilise resources towards better organisational performance. In this vein, Melnyk et al. (2004) contended that performance management is essential for strategy execution and value creation, and Ukko et al. (2007) portrayed performance management as a mechanism to increase interaction and communication in a way that resources are allocated towards high performance. When considering elements in performance management, Hald and Spring (2017) advocated Quality-planning and monitoring practices to organise resources and optimise productivity. From a lean production perspective, Birdi et al. (2008) argued that the higher quality achieved through quality-control brings repeat-orders and allows companies to charge premium prices, thus leading to competitive advantage. Hence, it is hypothesised:

H1: Performance management is positively associated with performance.

The empirical evidence in support of this hypothesis is mixed and limited to specific practices (e.g. Boyne and Chen, 2007; Waring and Bishop, 2010). In a study of quality-based strategies in manufacturing, Van der Stede (2006) observed positive correlation between the use of performance measurement and organisational performance. Gadenne and Sharma (2009), specifically noted that planning processes and keeping databases for monitoring were associated with quality improvements in Australian SMEs and conjectured indirect effects on organisational performance. Walker et al. (2011) analysed performance management in local government and noted positive effects on organisational performance, which are in line with conclusions by Bloom and Van Reenen (2010) that the extent of use of modern management practices is positively associated with organisational performance and, specially, that variations in performance management systems can explain differences in organisational performance. Yet, Bloom and Van Reenen (2010) also illustrated that positive association between performance management practices and organisational performance cannot be generalised.

Indeed, Mellat-Parast et al. (2011) found Quality-planning to be independent of quality-outcomes, and previously Braam and Nijssen (2004) even concluded that performance monitoring can become worthless, although, as a need for alignment with organisational strategy was stressed, they implied links between Quality-planning and performance. More recently, Escrig and de Menezes (2015) observed that clearly disseminated strategies characterised high-performing organisations in Spain. Furthermore, a comprehensive meta-analysis of the link Quality Management-performance (Nair, 2006) showed that Information & Analysis was positively associated with overall performance and customer satisfaction but correlated neither with quality, nor with operational performance. In short, how performance management may improve performance remains to be clarified.

Studies by Linderman et al. (2003, 2006) concerning Six-sigma, a Quality Management approach that has Quality-planning and data analysis at its core, examined how behavioural theories aid understanding of the extent to which improvement initiatives can be effective. Specifically, they addressed how Goal Theory explains relationships between Quality-planning and worker-performance and, importantly, whether arguments based on reactions of an individual can be extrapolated to group-levels. Following Locke and Latham (1990), Linderman et al. (2006) argued that challenging targets can enhance performance not only by mobilising effort, but also by encouraging persistence and collaboration in problem-solving. In their view, Goal Theory illustrates the significance of behavioural aspects for Quality Management. Indeed, if target-setting were simply a technical issue, the more difficult the target, the higher would be performance. Yet, Goal Theory implies that this is not the case: when targets are too difficult to achieve, they can lead to low morale in a workplace, decrease employee wellbeing and, ultimately, negatively affect performance. In short, people can play a significant role in the success of performance management, and thus perceptions of performance management are likely to mediate pathways to performance.

2.3. Employee-perceptions of work conditions and wellbeing in pathways to performance

Although there were attempts in Operations Management to address how employee wellbeing may influence productivity (e.g., Ødegaard and Ross' (2014) model of productivity), few scholars (de Leeuw and van den Berg, 2011; Smith and Bititci, 2017) have actually examined how performance management practices might improve performance via employee-outcomes. By contrast, within Human Resource Management, how employee outcomes can influence performance has been addressed (Wood et al., 2012; Van De Voorde et al., 2012; Peccei and Van De Voorde, 2019). According to Jiang et al. (2012), distinct perspectives (behavioural, human capital and resource-based theories) imply that employee-perceptions of work conditions determine how employees use their capabilities in the job and, ultimately, how organisations perform. At the heart of this reasoning, is the assertion that management practices influence employee-perceptions of work conditions and wellbeing, thus indirectly impacting organisational outcomes. Indeed, several scholars observed improvements in employee-perceptions of work conditions after continuous improvement initiatives. For example, Bititci et al. (2006) concluded that performance measurement systems facilitate the interaction between management and employees, which can lead to a consultative management style that may positively influence employee-perceptions of work conditions. Ebrahimi et al. (2014) argued that by clarifying expectations at different levels in the organisation and providing feedback from actual records, performance management reduces role stressors and increases employee-perceptions of favourable work conditions. More broadly, a stream of literature positively correlates management practices, work climate and performance (e.g. Gelade and Ivery, 2003; Taris and Schreurs, 2009).

Improvements in job satisfaction following Quality Management have been observed (Ooi et al., 2013) and, specifically in performance management, such improvement is expected when

goals are set, results incentivised in line with employee expectations, and the workforce is motivated (Van Waeyenberg et al., 2017, Opstrup and Pihl-Thingvad, 2018). Job satisfaction, "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (Locke, 1976: 1304) is as an important dimension of wellbeing (Warr, 1990) and can be interpreted as a utility that individuals infer from their work. When employees are satisfied with their jobs, they are more likely to engage in discretionary efforts to achieve targets (e.g. Ostroff and Bowen, 2000) and improve performance (e.g. Guest, 2017). Job satisfaction has been found to be positively correlated with the quality of products and services (Korunka et al., 2003; Sanda and Kuada, 2016) and with workplace-productivity (de Menezes, 2012). Moreover, while attempting to quantify the impact of job satisfaction in Finland using the European Community Household Panel from 1996 to 2001, Boeckerman and Ilmakunnas (2012) estimated that one within-plant standard deviation increase in job satisfaction improved productivity (value-added) per hour worked by 6.6 percent. Importantly, spillover effects at group-levels of employee job satisfaction have been found (e.g. Tumen and Zeydanli, 2016). In summary,

H2a: There are indirect effects of performance management on performance via employee-perceptions of work conditions.

H2b: There are indirect effects of performance management on performance via job satisfaction.

Given the above hypotheses, Figure 1 depicts three potential pathways to performance. Notwithstanding these, employee-perceptions of work conditions are likely to affect job satisfaction. It can also be argued that pathways to performance depend on whether performance management is perceived by employees as a resource or as additional demands, and on how this perception may impact their job satisfaction. In this vein, the job demands-control model (JDC) (Karasek, 1979; Karasek and Theorell, 1990) and the broadly

conceptualised job demands-resources model (JDR) (Bakker and Demerouti, 2017) can unveil additional pathways from performance management to performance.

Figure 1

The likely effects of job demands and job resources on job satisfaction

Following Demerouti et al. (2001), employee-perceptions of work conditions are generalised in two categories: job demands and job resources. The former concerns aspects of the job that require physical or mental effort (Fila et al. 2017), such as long hours or tight deadlines. By contrast, job resources refer to other aspects which individuals perceive to facilitate their work, for example, manager support and feedback. The JDR model implies positive correlation between job resources and job satisfaction, as well as negative correlation between job demands and job satisfaction (e.g. Harney et al., 2018). As highlighted in a recent meta-analysis, this model has become a well-established framework to examine employee-wellbeing in a wide range of contexts (Lesener et al., 2019). The JDC model, which precedes the JDR as an explanation for employee-wellbeing (Häusser et al., 2010), is more specific and centred on job control (the amount of decision latitude or an individual's ability to directly influence the work and its environment) as a powerful resource. According to this model, job demands negatively impacts wellbeing, but where employees have some job control, the correlation between job demands and wellbeing is weaker. Taking together the prescriptions from both models, job control is a job resource that moderates the association between job demands and job satisfaction. The likely implications of the JDR and JDC models for effectively managing performance are inferred below.

Performance Management as a resource: indirect effects via job control

In Quality Management initiatives, Quality-planning and Information & Analysis practices are put in place so that employees can understand what is asked from them and act as needed.

Hence, performance management may entail a participative management style which can increase employee-perceptions of job control (Bititci et al., 2006); for example, quality-circles are opportunities to voice concerns or propose solutions. The sole provision of information that follows from action plans, targets and feedback from performance-monitoring, without employees experiencing some power over their work, would lead to frustration of being unable to use the information acquired.

While addressing potential effects of management practices, scholars have investigated the association between forms of job control and job satisfaction. For example, Wood et al. (2012) concluded that British workers were more satisfied when given greater autonomy in their jobs, and specifically, Sanda and Kuada (2016) observed positive indirect effects from perceptions of job autonomy on organisational performance. As per the JDR model, job control is a resource that meets employee-needs for autonomy and fosters a motivational process that improves wellbeing (Schaufeli and Bakker, 2004). Hence, when performance management practices are interpreted as sources of job control, they can increase job satisfaction and indirectly affect performance, i.e.:

H3: There are positive indirect effects of performance management on job satisfaction via job control.

Performance Management as Job demands: indirect effects via job demands

The effect of job satisfaction on performance may vary with the measures considered (Jones, 2006), but most importantly, it is likely to depend on employee-perceptions of job demands (Saari and Judge, 2004). As improvement initiatives can be implemented via strict management-led procedures to reach targets, they can impact job satisfaction via perceptions of job demands. In fact, since the early implementations of Quality Management in the West, it has been claimed that benefits from improvement initiatives are at the expense of employees having greater job demands (e.g. Godfrey et al., 1997; Conti et al., 2006; Cullinane et al., 2014).

Kivimäki et al. (1997) equated Quality Management to a combination of information overload and monitoring, while Ittner and Larcker (1997: 310) quoted a CEO, whose company won the Deming Prize: "too great an emphasis on indicators, charts, graphs, reports, and meetings in which documents and indicators are assessed deprive employees of time that could be better spent serving the customer". Parker (2003) and Carter et al. (2011) argued that performance management in Lean intensifies work. Recently, from a human resource management perspective, Tweedie et al. (2019) explained that most of the criticism concerning performance management follows from Labour Process Theory, where performance management is viewed as a tool for dominating employees. Accordingly, Verbeeten and Speklé (2015) depicted a results-oriented culture, where goals that can be difficult to measure result in dysfunctional behaviour, rather than better performance. Generally, performance management practices have been interpreted as increasing job demands (Hirst et al., 2008; Conway et al., 2016) and, faced with high levels of job demands, employees are likely to experience reductions in job satisfaction (Decramer et al., 2015; Wood and de Menezes, 2011). In summary,

H4: There are negative indirect effects of performance management on job satisfaction via job demands.

Following the JDC and JDR models, high levels of resources would offset negative effects of job demands (Häusser et al., 2010; Fila et al., 2017). Specifically, the JDC model states that job control, as a major resource, offsets negative effects of job demands on job satisfaction: high levels of job control allow employees to adapt to job demands, by having greater discretion to channel their energy more productively (Wong et al., 2007). Hence,

H5: Job control moderates the negative association between job demands and job satisfaction, such that its strength will be less intense when job control is higher.

From these hypotheses, alternative paths from performance management to workplace-performance are inferred, as depicted in Figure 2. In the next section, the empirical study designed to assess these paths is reported.

Figure 2

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3. The study

3.1. Data

The data is from the 2011 British Workplace Employee Relations Survey (WERS2011; http://www.wers2011.info/), which is the last in a series that led to several analyses of the management practices-performance nexus within management and industrial relations (e.g. van Wanrooy et al., 2013; Wu et al., 2015), but rarely in Operations Management. The sample comprises workplaces with five or more employees in private and public sectors, except for agriculture, forestry, fishing, mining and quarrying.

Two instruments are considered: the management-survey, which is based on face-to-face structured interviews with a senior manager at the workplace, and the employee-survey based on self-completion questionnaires distributed in workplaces where managers agreed to participate. The predominantly fact-based questionnaires included established scales and yes/no questions, which were cognitively designed and tested. Before fieldwork for the management-survey, a pilot-study validated procedures and was followed by a dress-rehearsal. Selected interviewers were experienced and trained by NatCen (the UK's National Centre for Social Research) and relied on a 121-page exhaustive instruction manual with comprehensive information that enabled them to explain all concepts in the questionnaire during the interview. In addition, cards with clear definitions were used in interviews, so that the process and content

were the same for all participants. In short, a great effort was placed to avoid biases in responses.

Given that interviewers were trained to encourage cooperation, in 81% of workplaces, senior managers gave permission for the employee-survey. After being selected at random by the interviewer from a list provided by management, up to 25 employees filled a paper-questionnaire. In total 44,371 questionnaires were distributed, of which 21,981 returned were usable, thus representing a response rate of 50%. Matched workplace-employee data (21,981 employees; 1,923 workplaces) are considered in this study.

Following preliminary analysis of the data, at workplace and employee-levels, 6 workplaces and 145 employees are judged to be random outliers, and correspond to less than 0.01% of the sample. These cases are excluded from the sample, leaving 21,836 employees and 1,917 workplaces. Most workplaces (74.5%) have less than 250 employees, and the average number of employees per workplace is 420.93 with a standard deviation of 1,204.75; 52% of workplaces belong to organisations of 1,000 or more employees. On average, organisations were in operation for 4.43 years (standard deviation=1.83) with 11.6 % workers in routine jobs. Most employees were at least 30-years old (81.6%) or female (56.2%). The majority (54.9%) were employed in the workplace for five years or more. Further details concerning the profile of the sample are summarised in Table 2.

Table 2

3.2. Measures

Performance Management

Binary indicators of performance management practices adopted at each workplace are obtained from the management survey, their distributions and correlations are reported in the Appendix. Bivariate associations, measured by tetrachoric-correlations using Stata15, show

that some associations are strong (correlations greater than 0.6, e.g., between targets on different indicators of performance), while others are weak (correlation lower than 0.2). Practices such as monitoring employee-performance or customer feedback are mostly independent of other practices. The correlation matrix is not positive definite (has two negative eigenvalues) and a common factor cannot be extracted from the data. By forcing the correlation matrix to be semidefinite, principal components are extracted: the first component (mean) explains 36% of the variance and a scree-plot indicates a minimum of 3 components that would explain 58% of the variance, which however do not suggest meaningful systems. In addition, several variables have over 65% of their variance unexplained by the estimated components, thus there are different dimensions in the data. Although this result may reflect the sparseness of the data, given the number of variables considered, the correlation structure does not support a performance management orientation or an integrated system underlying the use of practices. Based on two core elements in Quality Management (Quality-planning; Information & Analysis), Table 3 summarises the measures in the study, and how they can be obtained is explained below.

Table 3

Quality-Planning

Confirmatory factor analysis justifies modelling Quality-planning as two correlated dimensions (fit indices: $\chi 2=4.299$, d.f.=4, p-value=0.3671; CFI=1; RMSEA=0.006): the first concerns the setting of targets, and is measured as a two-factor model of distinct sets of targets (on performance and workplace related outcomes, as implied by a Principal Component Analysis (PCA) of the correlation of the 11 binary indicators in Table 3); the second dimension assesses how the strategy is disseminated, and is measured by a factor based on three binary

indicators of: information disclosure, formal strategic plan, and team briefings, as described in Table 3.

Information & Analysis

The correlation matrix of Information & Analysis practices suggest two factors (fit indices: χ^2=17.27, d.f.=5, p-value=0.004; CFI=0.974; RMSEA=0.036). The first factor, keeping records, stems from 2 components identified via PCA relating to the type of target (performance, workforce). A second factor concerns analysing records through quality circles and benchmarking. Monitoring customer feedback and monitoring employee-performance are not explained by the common factors (Uniqueness > 0.75), thus they are measured as separate binary variables.

Performance

The measures of performance are management's assessments of labour productivity and quality of products or services relative to competitors on a 5-point scale, as in previous WERS studies (e.g. Wood et al., 2012). Considering their distribution in the sample, the lowest category had very few observations, thus the two lowest categories were merged, so that productivity and quality are here measured as ordinal variables on a 4-point scale (below average, average for industry, better than average, a lot better than average)[1].

Given that these measures are assessments made by a senior manager in the workplace, they have been previously investigated and reported to corroborate objective-performance measures (Forth and McNabb, 2008; van Wanrooy et al., 2013). In addition, a similar measurement of financial performance is available in WERS2011, and bivariate correlations between the different performance assessments can be estimated. These are less than 0.3, thus indicating that managers' ratings of performance are not always in the same direction. Furthermore, few variables in the management survey are highly correlated and, as described above, there is no

indication of a common factor that could explain a large proportion of the variance in the data, thus the possibility of significant common method bias can be discarded.

Employee-level variables

As shown in Table 3, employees were asked how satisfied they were with nine aspects of their job (van Wanrooy et al., 2013). These items are based on Warr's (1979) scale, which has 15 items that, in the UK, have been adapted not only in the WERS series but also in the British Household Panel Survey. Given the correlation structure, a single dimension is confirmed via PCA, thus the mean of these items is used as a measure of job satisfaction, in line with different studies that adopted Warr's scale (e.g. Gazioglu and Tansel, 2006). A reliable measure is obtained (composite reliability=0.87), thus corroborating previous studies (e.g. Perales and Tomaszewski, 2015; Trivellas and Santouridis, 2016; Pick and Teo, 2017).

Job control is measured as the mean of five items concerning employees' perception of their influence over specific aspects of their work (composite reliability=0.82). This measure follows the definition in the original JDC model (Karasek, 1979), as well as more recent studies (e.g. Van Yperen and Hagedoorn, 2003; Wood et al., 2012). Similarly, Karasek's job demands factor, which is generally interpreted as a combination of workload and time pressure (Smulders et al., 1999, Genin et al., 2016), is considered. Job demands are therefore measured as the mean of two items on employee-perceptions of intensity and pressure in the job (composite reliability=0.70).

Table 4 reports the estimated correlations between the variables in the subsequent models. Concerning employee-level variables, intra-class correlations imply significant variation among workplaces, as they are equal to 0.14, 0.11, and 0.12 for job satisfaction, job demands and job control, respectively. Accordingly, the workplace-level explains over 10% of the

variance in each measure, thus two-level structural equation models are used to assess Figure 2.

Table 4

Tests of associations are controlled at both levels. Workplace-level controls are: size of the establishment (logarithm of the number of employees in the workplace); size of total organisation of which the workplace is a part (dummy-variables such that organisations with less than 100 employees is the reference size); sector (dummy-variables, baseline=manufacturing); public or private status (public=1); years in operation (number of years the workplace has been in operation); and percentages of operational and routine workers. At the employee-level, binary indicators of individual characteristics commonly associated with job satisfaction are included: being a manager (manager=1); age (bands: 16-19 years, 20-21, 22-29, 30-39, 40-49, 50-59, 60-64, 65 and above; with less than 20 years as the reference category); gender (female=1); tenure (bands: <1 year, 1 to less than 2 years, 2 to less than 5 years, 5 to less than 10 years, 10 years or more; less than 1=reference) and low earnings (below minimum wage=1).

3.3. Hypothesis Testing

The hypotheses are tested via two-level structural equation models. As employees are nested in workplaces, dependencies in the data are considered simultaneously in two structural models (within-group and between-group), which take into account that employees within the same workplace are subject to similar environment, policies and other practices. MPlus (Muthén and Muthén, 2015) is used and at least two of the available alternatives for maximum likelihood estimation are run in order to ensure convergence. Four separate models of Figure 2 are estimated and assess pathways from an element of performance management to a measure of

performance, i.e.: two models for Quality-planning (quality of products/services, productivity); two models for Information & Analysis (quality of products/services, productivity). Following Van De Voorde et al. (2016), the guidelines by MacKinnon et al. (2007) are considered: to infer mediation, a statistically significant association between the independent variable and the mediator variable, as well as between the mediator and the dependent variable should be found. The within-level part of each model examines how job satisfaction in a workplace may be affected by perceptions of job control and job demands. The between-level part of each model assesses how variations in performance may be explained by Quality-planning or Information & Analysis, as well as the employee-outcome variables. When the dependent variable (productivity, quality of products/services) in a path is ordinal, an ordered-logit regression is estimated; otherwise, paths are estimated by linear regression.

The robustness of the results is assessed by estimating each model in subsamples (multi-group analysis) and comparing differences in models (and coefficients, when models are judged to be different based on Chi-Square Difference tests). First, differences between public and private sector are assessed. Secondly, the likely effect of size was examined via two aspects: the size of the organisation of which the workplace is part, and the size of workplace. Since small/medium workplaces could be part of wider organisations, in this second analysis, the focus is on single-site workplaces that have less than 250 employees (in line with the EU's definition of small/medium organisation), which correspond to 51.9% of the sample, for which the estimated model is compared to the model of the remaining of the sample. The aim of this final analysis is to examine whether the associations differ in small/medium organisations, and if so, assess the implications for managers and future research.

4. Results

Tables 5 and 6 summarise the tests for each element (Quality-planning, Information & Analysis), respectively. Minor differences between ML and MLR estimates are observed when p-values are close to 0.05, so the coefficients based on MLR, which are robust to deviations from normality, are reported. Few direct associations with performance are significant at 5% level. Strategy dissemination (b=1.743, p=0.02), keeping records on targets (b=1.295, p=0.01), and monitoring employee-performance (b=0.335, p=0.01) may directly increase productivity in workplaces. Quality-planning is unrelated to quality, while Analysing Records (b=0.586, p=0.05) and monitoring employee-performance (b=0.529, p=0.00) are positively associated with quality. Therefore, Hypothesis 1 is supported by some elements in performance management, and the association with productivity appears to be stronger than the one with quality.

As shown in Tables 5 and 6, there are neither effects on productivity or quality via work conditions (job demands or job control) nor effects via job satisfaction, despite strategy dissemination, targets and keeping records on them being associated with perceptions of work conditions, and job satisfaction being positively associated with both productivity and quality. In short, hypotheses 2a and 2b are rejected.

Concerning expectations based on the JDC and JDR models (H3-H5), job satisfaction is positively associated with job control (positive and significant coefficients in all models, p=0.00), and negatively correlated with job demands (b=-0.138, p=0.00 in Table 5; b=-0.125, p=0.00 in Table 6). Hypothesis 3 is rejected, negative indirect effects of having targets (b=-0.109, p=0.03) and keeping records related to them (b=-0.119, p=0.00) on job satisfaction via job control are found. Hypothesis 4 is partially supported: indirect effects of targets (b=0.044, p=0.01) and keeping records (b=0.028, p=0.05) via job demands are positive, since having targets and keeping records on them are negatively associated with perceptions of job demands,

which are negatively correlated with job satisfaction; in contrast, strategy dissemination is positively associated with job demands, which is negatively associated with job satisfaction, and thus a negative indirect effect of strategy dissemination on job satisfaction is observed (b= -0.040, p=0.01).

Following associations between perceptions of work conditions and job satisfaction, additional pathways from performance management to productivity are likely. First, positive indirect effects of targets via job demands and job satisfaction on productivity are found (b=0.029, p=0.03). Secondly, given the potential increase in job demands from strategy dissemination, negative indirect effects of strategy dissemination on productivity are found (b=-0.027, p=0.03). Thirdly, keeping records is negatively associated with productivity via expected reductions in job control and job satisfaction (b=-0.116, p=0.01).

As for quality, there may be positive indirect effects of targets (b= 0.045, p=0.01) via expected decrease in job demands and consequent increase in job satisfaction, but also negative indirect effects via job control and job satisfaction (b=-0.111, p=0.04). In addition, negative indirect effects of strategy dissemination (b=-0.041, p=0.01) and keeping records on targets (b=-0.137, p=0.00) are found.

Concerning the moderation of the link job demands-job satisfaction via job control, Hypothesis 5 is supported at employee-level, but not at the workplace-level. That is, job control is positively associated with job satisfaction (b=0.432, p=0.00) and its interaction with job demands is significant and positively associated with job satisfaction (b=0.047, p=0.00) at the employee-level. However, this interaction is non-significant at the workplace-level (b=0.054, p=0.45). In summary, job control may counteract the effect of job demands on employee-job satisfaction but cannot explain differences in the association between levels of job demands and job satisfaction in workplaces.

Table 5

Table 6

The estimated coefficients of control-variables imply that productivity is lower in larger workplaces, and public workplaces are linked with lower quality of products/services. Job satisfaction and job control are also lower in large and public workplaces. Perceptions of job control decrease when the percentage of routine workers increases, while perceptions of job demands are greater in the public sector and lower in workplaces with higher percentages of routine workers. At employee-level, being manager or female are positively associated with perceptions of job satisfaction, job control and job demands. Low earnings are associated with lower job control and demands, but with greater job satisfaction. By contrast, tenure is positively correlated with perceptions of job control and job demands, but negatively correlated with job satisfaction. Employees that are 65 or older tend to perceive lower job demands, greater job control and are more satisfied with their jobs; teenagers perceive lower job demands and greater job satisfaction when compared to the other age-groups.

When comparing models for public and private sectors, the associations are consistent between the two samples, though in the public sector, indirect negative effects of monitoring employee-performance via job satisfaction ($p=0.00$) on quality ($p=0.00$) and productivity ($p=0.02$) are observed. Multi-group analysis implies no differences with respect to the size of the organisation of which the workplace belongs, as measured in the data. Yet, when small/medium organisations are considered, coefficients are the same for most associations, but differ at the 5% significance level with respect to: strategy dissemination, monitoring employee-performance, and analysing records. The first two practices appear to be unrelated to

performance in small/medium organisations and highlight the importance of strategy dissemination for quality, and performance monitoring for productivity when there are multiple sites or when the establishment is large ($p< 0.01$). By contrast, the positive association between strategy dissemination and job satisfaction is stronger in small/medium organisations ($p=0.046$). As for analysing records, this practice is positively associated with job control ($p=0.004$) and job demands ($p=0.047$) in small/medium organisations. Analysing records is negatively associated with job control when there are multiple sites or the workplace is large ($p=0.01$). Finally, while job satisfaction and job control appear to be less associated with performance in small/medium organisations, the former is positively ($p=0.00$) and the latter is negatively associated ($p<0.02$) with both measures of performance in large workplaces, or where the parent organisation has multiple sites.

Table 7 summarises the hypotheses tested and main findings in relation to previous literature. Implications of these findings are discussed in the next section.

Table 7

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5. Discussion

Performance Management in British Workplaces

Our results highlight that most workplaces do not have an integrated performance management system, since some practices are weakly correlated or used independently of most others. The monitoring of customer feedback and monitoring employee-performance must be perceived as unique dimensions in performance management, thus suggesting that marketing, human resources and operations might be generally treated as separate activities. The observed frequencies (Appendix) highlight significant variance in use of practices, quality circles are only adopted in 31% of workplaces while records on costs are kept in 89% of workplaces, as well as a likely greater concern with keeping records and top-down communication. In all,

there is no support for a universal or systematic adoption of best practice, as would be expected in successful Quality Management initiatives.

Since the observed associations between the two types of practice (Quality-planning and Information & Analysis) appear weaker than often reported in the literature, it is noteworthy that a significant share of studies of Quality Management and performance relied on data from award-winners, accredited or recognised as excellent organisations. This study, however, covers a diverse sample of workplaces (number of employees vary from 5 to 20,746) from different sectors in the British economy, many of which are single sites. Integrated Quality Management systems may be too onerous for small establishments, which may then rely on good communication and record keeping. In short, the heterogeneity of the sample may partly explain the lack of cohesion in use of performance management practices. Nevertheless, the findings are in line with expectations that managers have narrow interpretations of performance management (Braam and Nijssen, 2004), which are then unlikely to deliver the expected improvements (Ittner and Larcker, 1997).

In recent literature, two types of performance management have been theorised (e.g. Bourne et al., 2013; Koufteros et al., 2014; Franco and Doherty, 2017; Soltani and Wilkinson, 2018). The first emphasises control through performance indicators and targets, while the second stresses communication, development (training), and employee-involvement. Our findings do not support this categorisation. The coexistence of performance management practices is much more varied. In addition, the monitoring of employee-performance via an appraisal that accounts for staff development is independent of other practices. Hence, the likely impact of performance management practices on perceptions of work conditions and wellbeing is not as clear-cut as theorised and, specifically, the results question presumptions of negative association between targets, which are key to a directive performance management approach (Franco and Doherty, 2017), and employee wellbeing.

The direct association with performance

Given that strategy dissemination and keeping records are positively associated with productivity and monitoring employee-performance is associated with both productivity and quality of products/services, it is noteworthy that these practices are widely used in the sample, with an average coverage of 80% of workplaces, and that target-setting and data analysis practices are less adopted (at most 45% on average adopt the related practices). It could be that managers learn from experience, and thus practices observed to be linked with aspects of performance become more widespread.

Considering correlations between strategy dissemination as well as keeping and analysing records with productivity, it seems that performance management is about good communication, when optimising resources (Ukko et al., 2007; Bourne et al., 2013; Hald and Spring, 2017). Consequently, there is some support for Resource Orchestration Theory and previous related findings on associations between Quality-planning practices and performance (Jitpaiboon and Rao, 2007; Gadenne and Sharma, 2009; Bloom and Van Reenen, 2010; Leeuw and van den Berg, 2011; Walker et al., 2011; Pavlov et al., 2017). In this vein, by emphasising the need to capture data (keeping records) and information provision (strategy dissemination and analysing records), our findings support arguments by Franco et al. (2012).

Since monitoring employee-performance is directly associated with both productivity and quality, the emphasis on appraisal that typifies the performance management literature (e.g. Tweedie et al. 2019; DeNisi and Murphy, 2017) may have been vindicated. Yet, it could also be that this emphasis in academic thinking has been translated to practice. In any case, this result supports conclusions from Quality Management scholars, which stressed the value of having performance appraisals focused on the development of skills and the provision of feedback to employees (e.g. Escrig et al., 2016; Soltani and Wilkinson, 2018). Furthermore,

the original concerns of Deming with respect to performance appraisals may be outweighed by the likelihood of performance gains.

Taking into account the identified pathways to performance, it can be argued that a decision-facilitating use of performance management is likely to positively impact productivity, for this prescribes communication and clarification of targets as a platform for improvement (Bourne et al., 2005; Koufteros et al., 2014). Contrary to the findings of Pavlov et al. (2017), direct associations between targets and performance are not observed, thus suggesting indirect effects of targets via perceptions of work conditions and job satisfaction.

Robustness checks of results imply that effects of performance management may differ with respect to the size of the workplace. Specifically, strategy dissemination and monitoring employee performance seem to be less relevant for performance in small/medium organisations. This may support conclusions by Bourne et al. (2013) that such organisations adopt more engaging approaches to performance management due to their lower reliance on formal channels and greater use of opportunities for direct communication.

Indirect effects via work conditions and job satisfaction and implications

Strategy dissemination can be a source of additional job demands (e.g. new tools or knowledge could be needed), corroborating conclusions by Conway et al. (2016), and thus may reduce job satisfaction and negatively impact productivity and quality. Despite this general implication, an effect of workplace size is also likely, since in small/medium organisations the information provided via strategy dissemination (e.g. a strategic plan, information disclosure, meetings) may foster a sense of participation that can contribute to job satisfaction, which however does not significantly affect the relationship with performance.

Unexpectedly, targets and keeping records are negatively associated with job control at workplace level and are also negatively associated with perceptions of job demands, thus

differing from previous observations in the literature. There may be a trade-off between the amount of job control that is lost from being subject to these practices and the extent that they can facilitate the delivery of work. Targets clarify what needs to be done, which may imply losing some autonomy, but this knowledge also facilitates decision-making, thus reducing perceptions of job demands, which may positively impact performance via job satisfaction. In addition, keeping records, despite an estimated marginally positive indirect effect on job satisfaction, has an expected indirect effect on performance via job satisfaction that is negative in total. From a manager's perspective, these elements of performance management are a job challenge, because they could both enable and inhibit wellbeing (Tuckey et al., 2012; Oppenauer and Van De Voorde, 2016). In this vein, Goal Theory implies that if targets were feasible and realistic, they would be resources, and according to the JDR model, they would counterbalance additional job demands from having to keep records and give up control over the work.

Other elements of performance management (analysing records, monitoring customer feedback or monitoring employee-performance) do not appear to affect perceptions of work conditions. Consequently, the likely aggregate impact of performance management systems on employee attitudes questions expectations based on previous studies that predict negative correlation (e.g. Carter et al., 2011; Decramer et al., 2015; Conway et al., 2016) or that infer positive correlation (e.g. Opstrup and Pihl-Thingvad, 2018). Nonetheless, based on the comparisons of subsamples, size may play a role in the associations with employee outcomes. In small/medium organisations, there is greater perception of job control irrespective of perceptions of increased job demands from analysing records, thus suggesting that some employees use the information gained from the analysis of records to increase their influence over the job. While, in large or multi-site organisations, employees may gain access to information through analysing records, but are less likely to be able to act upon this information due to more complex and formal

processes. As a whole, the results imply that the impact of performance management on workplace-performance is more likely to be via perceptions of work conditions, in line with previous conclusions (Sanda and Kuada, 2016; Franco and Doherty, 2017) that highlight how employee-wellbeing can be at least partly explained by work characteristics. Indirect links between performance management and group-level performance are supported, as implied in a few studies of human resource and performance managements (Leeuw and van den Berg, 2011; Smith and Bititci, 2017).

The JDC and JDR models' assumptions: the moderating role of job control

The JDC and JDR models are partially supported. Job demands are associated with lower levels of job satisfaction in workplaces, corroborating empirical results by Wood and de Menezes (2011) and van Wanrooy et al. (2013). In this study, however, job control and job satisfaction are also positively correlated at the workplace, thus confirming expectations of spillover effects. Yet, job control only moderates the negative association between job demands and job satisfaction at the employee-level, confirming predictions based on the JDR and JDC and previous studies that highlight its role as a stress reducer (Wong et al., 2007; Macky and Boxall, 2008). Given that the relationships at employee-level are stable throughout the different models and subsamples, criticisms that such relationships are weak and context-based as discussed in reviews of the literature on the JDC (e.g. Fila et al., 2017) are not supported. The lack of support for spillover effects from this moderation may owe to the fact that some variance at individual level is smoothed through averaging at the workplace-level, but may also reflect that, when data were collected, opportunities for employees to influence decision-making in British workplaces were limited (van Wanrooy et al., 2013).

Managerial implications

This study can inform management practice. Managers are advised to disseminate their strategy, encourage formal meetings that clarify targets and discuss quality issues, and capture data through keeping records on targets or benchmark against competitors. These elements of Quality-planning and Information & Analysis help in managing resources, direct employee efforts and can improve performance. However, strategy dissemination and monitoring may become unnecessary burdens, since they can increase employee-perceptions of having demanding jobs and decrease job satisfaction, thus trade-offs from Quality-planning and control need to be frequently monitored, especially in large organisations where job satisfaction may be more important for quality and productivity. In this vein, it is reassuring that potential reductions of job control from targets do not appear to affect productivity. Line managers are encouraged to focus on development when appraising employee-performance as this seems to be linked with productivity and quality, and thus may have indirect effects on financial performance. Most importantly, managers need to be aware that perceptions of work conditions and job satisfaction can affect performance, as this heterogeneous sample highlighted, it is mostly via perceptions of work conditions that practices may impact job satisfaction. Moreover, performance management practices do not appear to increase perceptions of job control, therefore in designing performance management systems a challenge is how to foster job control and indirect effects on performance via job satisfaction, and this has special implications in large organisations. Performance management and human resource management are thus inseparable, which stresses the importance of good communication and information sharing between different departments in the organisation.

Limitations and future research

This study shares limitations with most research on the management practices-performance nexus, especially the reliance on cross-sectional data and on a single respondent for practices and performance data. While the results support theories based on a specific direction of causality, the statistical models tested are also consistent with paths in the reverse direction (e.g. performance leading to job satisfaction). However, the evidence based on numerous case-studies and Quality-awards, as well as related theories, suggest that managers do not wait for better performance before introducing practices. In fact, the data highlight that most of the practices that may impact performance are widely adopted in British workplaces.

Findings are generally consistent in subsamples, but there is indication that size may affect some associations. In this vein, it is noteworthy that the research on performance management has generally neglected contextual effects on the association with organisational performance. As implied by Bender et al. (2018), cultural differences between countries may explain how performance is managed in organisations and may hinder generalisations from the above findings, but are avenues for future research in performance management. In addition, other factors in the work environment, such as management support, which can be incorporated in extensions of the JDR model (Lesener et al., 2019) may explain why different emphases on performance management are in place and help in addressing the British productivity dilemma. Drawing from Macky and Boxall (2008), the role of different types of rewards as moderators in the observed links at the employee-level can be examined, as they may be central to the employee-involvement presumed in continuous improvement, which can be envisaged as an interaction of power, information, reward and knowledge. Furthermore, differences in individuals might also explain resistance to Quality Management, and thus employee-characteristics that may moderate perceptions of working conditions or wellbeing can be explored via experiments and case-studies. Finally, cross-level interactions, spillover effects

and their evolution can be investigated, as the economics literature (e.g. Bloom et al., 2014) suggests that there are distinct trajectories to organisational performance and management practices explain why some organisations lag behind.

6. Conclusions

This study adds to the debate on the value of performance management in the context of Quality Management. By focusing on Quality-planning and Information & Analysis, which are the control element in continuous improvement initiatives, components of performance management are investigated. As an ad-hoc use of performance management seems to prevail, direct and indirect paths from specific aspects in performance management (e.g. strategy dissemination, setting targets and keeping records on these) are observed. Most noticeably, given that performance appraisals are widely adopted and criticised, monitoring employee performance and training needs is found to be linked to productivity and quality. In addition, the likely impact of performance management is mostly through perceptions of work conditions (job control and job demands) and their impact on job satisfaction. Hence, the findings support conclusions from studies of wellbeing in Economics, Management and Psychology on how perceptions of work conditions and job satisfaction can influence productivity and quality. Finally, considering potentially unintended effects of performance management on employees, it is reassuring that allowing employees control over their work can counteract effects of greater job demands on job satisfaction. In short, psychologically empowered and informed workers can better handle the control elements in Quality Management.

[1] It is possible that managers were unlikely to judge the performance of their workplace as "a lot below average". If this were a general tendency, it would impact the constant (intercept in a simple regression) but would not affect estimates of correlation or regression coefficients.

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References

Aguinis, H., (2013), *Performance Management*, 3rd ed., Pearson/Prentice Hall, Upper Saddle River, NJ.

Bakker, A.B. and Demerouti, E. (2017), "Job demands-resources theory: taking stock and looking forward", *Journal of Occupational Health Psychology*, Vol. 22 No. 3, pp. 273-285.

Bender, S., Bloom, N., Card, D., Van Reenen, J. and Wolter, S. (2018), "Management practices, workforce selection, and productivity", *Journal of Labor Economics*, Vol. 36 No. S1, pp. S371-S409.

Birdi, K., Clegg, C., Patterson, M., Robinson, A., Stride, C.B., Wall, T.D. and Wood, S.J. (2008), "The impact of human resource and operational management practices on company productivity: a longitudinal study", *Personnel Psychology*, Vol. 61 No. 3, pp. 467-501.

Biron, M., Farndale, E. and Paauwe, J. (2011), "Performance management effectiveness: lessons from world-leading firms", *International Journal of Human Resource Management*, Vol. 22 No. 6, pp. 1294-1311.

Bititci, U.S., Mendibil, K., Nudurupati, S., Garengo, P. and Turner, T. (2006), "Dynamics of performance measurement and organisational culture", *International Journal of Operations & Production Management*, Vol. 26 No. 12, pp. 1325-1350.

Bloom, N., Lemos, R., Sadun, R., Scur, D. and Reenen, J. (2014), "JEEA-FBBVA Lecture 2013: the new empirical economics of management", *Journal of the European Economic Association*, Vol. 12 No. 4, pp. 835-876.

Bloom, N. and Van Reenen, J. (2010), "Why do management practices differ across firms and countries?", *The Journal of Economic Perspectives*, Vol. 24 No. 1, pp. 203-224.

Bloom, N., Sadun, R. and Van Reenen, J. (2016), "Management as a technology", working paper, National Bureau of Economic Research, Cambridge, MA, 1433.

Boeckerman, P. and Ilmakunnas, P. (2012), "The job satisfaction-productivity nexus: a study using matched survey and register data", *Industrial and Labor Relations Review*, Vol. 65 No. 2, pp .244-262.

Bourne, M., Kennerley, M. and Franco, M. (2005), "Managing through measures: a study of impact on performance", *Journal of Manufacturing Technology Management,* Vol. 16 No. 4, pp. 373-395.

Bourne, M., Pavlov, A., Franco, M., Lucianetti, L. and Mura, M. (2013), "Generating organisational performance. The contributing effects of performance measurement and human resource management practices", *International Journal of Operations & Production Management*, Vol. 33 No. 11/12, pp. 1599-1622.

Boxall, P., Hutchinson A. and Wassenaar B. (2015), "How do high-involvement work processes influence employee outcomes? An examination of the mediating roles of skill utilisation and intrinsic motivation", *International Journal of Human Resource Management*, Vol. 26 No. 13, pp. 1737-1752.

Boyne, G.A. and Chen, A.A. (2007), "Performance targets and public service improvement", *Journal of Public Administration Research and Theory*, Vol. 17 No. 3, pp. 455-477.

Boyne, G. and Gould-Williams, J. (2003), "Planning and performance in public organizations. An empirical analysis", *Public Management Review*, Vol. 5 No. 1, pp. 115-132.

Braam, G.J.M. and Nijssen, E.J. (2004), "Performance effects of using the balanced scorecard: a note on the Dutch experience", *Long Range Planning,* Vol. 37 No. 4, pp. 335-349.

Bromiley, P. and Rau, D. (2014), "Towards a practice-based view of strategy", *Strategic Management Journal*, Vol. 35 No. 8, pp. 1249-1256.

Bromiley, P. and Rau, D. (2016), "Operations management and the resource based view: another view", *Journal of Operations Management*, Vol. 41, pp. 95-106.

Bryson, A., Forth, J. and Stokes, L. (2017), "Does employees' subjective well-being affect workplace performance?", *Human Relations*, Vol. 70 No. 8, pp. 1017-1037.

Capelli, P. and Tavis, A. (2016), "The performance management revolution", *Harvard Business Review,* Vol. 94 No. 10, pp. 58-67.

Carter, B., Danford, A., Howcroft, D., Richardson, H., Smith, A. and Taylor, P. (2011), "All they lack is a chain: lean and the new performance management in the British civil service", *New Technology, Work and Employment*, Vol. 26 No. 2, pp. 83-97.

Conti, R., Angelis, J., Cooper, C., Faragher, B. and Gill, C. (2006), "The effects of lean production on worker job stress", *International Journal of Operations & Production Management*, Vol. 26 No. 9, pp. 1013-1038.

Conway, E., Fu, N., Monks, K., Alfes, K. and Bailey, C. (2016), "Demands or resources? The relationship between HR practices, employee engagement, and emotional exhaustion within a hybrid model of employment relations", *Human Resource Management,* Vol. 55 No. 5, pp. 901-917.

Cullinane, S.J., Bosak, J., Flood, P.C. and Demerouti, E. (2014), "Job design under lean manufacturing and the quality of working life: a job demands and resources perspective", *The International Journal of Human Resource Management*, Vol. 25 No. 21, pp. 2996-3015.

de Leeuw, S. and van den Berg, J.P. (2011), "Improving operational performance by influencing shopfloor behavior via performance management practices", *Journal of Operations Management*, Vol. 29 No. 3, pp. 224-235.

de Menezes, L.M. (2012), "Job satisfaction and quality management: an empirical analysis", *International Journal of Operations & Production Management*, Vol. 32 No. 3, pp. 308-328.

Decramer, A., Audenaert, M., Van Waeyenberg, T., Claeys, T., Claes, C., Vandevelde, S., van Loon, J. and Crucke, S. (2015), "Does performance management affect nurses' well-being?", *Evaluation and Program Planning*, Vol. 49 April, pp. 98-105.

Demerouti, E., Bakker, A.B., Nachreiner, F. and Schaufeli, W.B. (2001), "The job demands-resources model of burnout", *Journal of Applied Psychology*, Vol. 86 No. 3, pp. 499-512.

Deming, E. (1986), *Out of the Crisis. Quality, Productivity and Competitive Position*, Cambridge University Press.

DeNisi, A.S., and Murphy, K.R. (2017), "Performance appraisal and performance management: 100 years of progress?", *Journal of Applied Psychology*, Vol. 102 No. 3, pp. 421-433.

Duncan, W.J. and Van Matre, J.G. (1990), "The gospel according to Deming: is it really new?" *Business Horizons*, Vol. 33 No. 4, pp. 3-9.

Ebrahimi, M. and Sadeghi, M. (2013), "Quality management and performance: an annotated review", *International Journal of Production Research*, Vol. 51 No. 18, pp. 5625-5643.

Ebrahimi, Z.F., Chong, C.W. and Rad, R.H. (2014), "TQM practices and employees' role stressors", *International Journal of Quality & Reliability Management*, Vol. 31 No. 2, pp. 166-183.

Escrig, A.B. and de Menezes, L.M. (2015), "What characterizes leading companies within business excellence models? An analysis of "EFQM recognized for excellence" recipients in Spain", *International Journal of Production Economics*, Vol. 169 November, pp. 362-375.

Escrig, A.B., Bou, J.C. and Beltrán, I. (2016), "Performance appraisal and compensation in EFQM recognised organisations: rhetoric and reality", *Universia Business Review*, No. 50 second quarter, pp. 72-105.

Fila, M.J., Purl, J. and Griffeth, R.W. (2017), "Job demands, control and support: meta-analyzing moderator effects of gender, nationality, and occupation", *Human Resource Management Review*, Vol. 27 No. 1, pp. 39-60.

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*, Vol. 39 No. 2, pp. 104-123.

Franco, M. and Doherty, N. (2017), "Performance management and well-being: a close look at the changing nature of the UK higher education workplace", *The International Journal of Human Resource Management,* Vol. 28 No. 16, pp. 2319-2350.

Franco, M., Kennerley, M., Micheli, P., Martinez, V., Mason, S., Marr, B., Gray, D. and Neely, A. (2007), "Towards a definition of a business performance measurement system", *International Journal of Operations & Production Management*, Vol. 27 No. 8, pp. 784-801.

Franco, M., Lucianetti, L. and Bourne, M. (2012), "Contemporary performance measurement systems: a review of their consequences and a framework for research", *Management Accounting Research*, Vol. 23 No. 2, pp. 79-119.

Gadenne, D. and Sharma, B. (2009), "An investigation of the hard and soft quality management factors of Australian SMEs and their association with firm performance", *International Journal of Quality & Reliability Management*, Vol. 26 No. 9, pp. 865-880.

Gazioglu, S. and Tansel, A. (2006), "Job satisfaction in Britain: individual and job related factors", *Applied Economics*, Vol. 38 No. 10, pp. 1163-1171.

Gelade, G.A., and Ivery, M. (2003), "The impact of human resource management and work climate on organizational performance", *Personnel Psychology*, Vol. 56 No. 2, pp. 383-404.

Genin, E., Haines III, V.Y., Pelletier, D., Rousseau, V. and Marchand, A. (2016), "Why the long hours? Job demands and social exchange dynamics", *Work*, Vol. 55 No. 3, pp. 539-548.

Gerhart, B., Wright, P.M., McMahan, G.C. and Snell, S.A. (2000), "Measurement error in research on human resources and firm performance: how much error is there and how does it influence effect size estimates?", *Personnel Psychology*, Vol. 53 No. 4, pp. 803-834.

Godfrey, G., Dale, B., Marchington, M. and Wilkinson, A. (1997), "Control: a contested concept in TQM research", *International Journal of Operations & Production Management*, Vol. 17 No. 6, pp. 558-573.

Guest, D.E. (2017), "Human resource management and employee well-being: towards a new analytic framework", *Human Resource Management Journal*, Vol. 27 No. 1, pp. 22-38.

Hald, K.S. and Spring, M. (2017), "Productivity and performance management", in *24th EurOMA Conference*, July, Edinburgh-UK.

Harney, B., Fu, N. and Freeney, Y. (2018), "Balancing tensions: buffering the impact of organisational restructuring and downsizing on employee well-being", *Human Resource Management Journal*, Vol. 28 No. 2, pp. 235-254.

Häusser, J.A., Mojzisch, A., Niesel, M. and Schulz-Hardt, S. (2010), "Ten years on: a review of recent research on the Job Demand-Control (-Support) model and psychological well-being", *Work & Stress*, Vol. 24 No.1, pp. 1-35.

Hietschold, N., Reinhardt, R. and Gurtner, S. (2014), "Measuring critical success factors of TQM implementation successfully-a systematic literature review", *International Journal of Production Research*, Vol. 52 No. 21, pp. 6254-6272.

Hirst, G., Budhwar, P., Cooper, B.K., West, M., Long, C., Chongyuan, X. and Shipton, H. (2008), "Cross-cultural variations in climate for autonomy, stress and organizational productivity relationships: a comparison of Chinese and UK manufacturing organizations", *Journal of International Business Studies*, Vol. 39 No. 8, pp. 1343-1358.

Hitt, M.A., Ireland, R.D., Sirmon, D.G. and Trahms, C.A. (2011), "Strategic entrepreneurship: creating value for individuals, organizations, and society", *Academy of Management Perspectives*, Vol. 25 No. 2, pp. 57-75.

Ittner, C.D. and Larcker, D.F. (1997), "Quality strategy, strategic control systems, and organizational performance", *Accounting, Organizations and Society*, Vol. 22 No. 3, pp. 293-314.

Jiang, K.F., Lepak, D.P., Hu, J. and Baer, J.C. (2012), "How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms", *Academy of Management Journal*, Vol. 55 No. 6, pp. 1264-1294.

Jitpaiboon, T. and Rao, S. (2007), "A meta-analysis of quality measures in manufacturing system", *International Journal of Quality & Reliability Management*, Vol. 24 No. 1, pp. 78-102.

Jones, M.D. (2006), "Which is a better predictor of job performance: job satisfaction or life satisfaction." *Journal of Behavioral and Applied Management*, Vol. 15 No. 6, pp. 77-97.

Karasek, R.A. (1979), "Job demand, job decision latitude, and mental strain: implications for job redesign", *Administrative Science Quarterly*, Vol. 24 No. 2, pp. 285-315.

Karasek, R.A. and Theorell, T. (1990). *Healthy work: stress, productivity and the reconstruction of working life*, Basic Books, New York.

Ketokivi, M. and Castaner, X. (2004), "Strategic planning as an integrative device", *Administrative Science Quarterly*, Vol. 49 No. 3, pp. 337-365.

Kivimäki, M., Mäki, E., Lindström, K., Alanko, A., Seitsonen, S., and Järvinen, K. (1997), "Does the implementation of total quality management change the wellbeing and work-related attitudes of health care personnel?" *Journal of Organizational Change Management*, Vol. 10 No. 6, pp. 456-470.

Korunka, C., Scharitzer, D., Carayon, P. and Sainfort, F. (2003), "Employee strain and job satisfaction related to an implementation of quality in a public service organization: a longitudinal study", *Work & Stress*, Vol. 17 No. 1, pp. 52-72.

Koufteros X., Verghese A. and Lucianetti, J. (2014), "The effect of performance measurement systems on firm performance: a cross-sectional and longitudinal study", *Journal of Operations Management,* Vol. 12 No. 6, pp. 313-336.

Laosirihongthong, T., Teh, P.L. and Adebanjo, D. (2013), "Revisiting quality management and performance", *Industrial Management & Data Systems*, Vol. 113 No. 7, pp. 990-1006.

Lesener, T., Gusy, B. and Wolter, C. (2019), "The job demands-resources model: a meta-analytic review of longitudinal studies", *Work & Stress*, Vol. 33 No. 1, pp. 76-103.

Linderman, K., Schroeder, R.G., and Choo, A.S. (2006), "Six Sigma: the role of goals in improvement teams", *Journal of Operations Management*, Vol. 24 No. 6, pp. 779-790.

Linderman, K., Schroeder, R.G., Zaheer, S., and Choo, A.S. (2003), "Six Sigma: a goal-theoretic perspective", *Journal of Operations management*, Vol. 21 No. 2, pp. 193-203.

Locke, E.A. (1976), "The nature and causes of job satisfaction", in Dunnette, M.D. (Ed.), *Handbook of industrial and organizational psychology*, Rand McNally, Chicago, IL, pp. 1297-1349.

Locke, E.A. and Latham, G.P. (1990), *A theory of goal setting and task performance*, Prentice Hall, Englewood Cliffs, NJ.

MacKinnon, D.P., Fairchild, A.J. and Fritz, M.S. (2007), "Mediation analysis", *Annual Review of Psychology*, Vol. 58, pp. 593-614.

Macky, K. and Boxall, P. (2008), "High-involvement work processes, work intensification and employee well-being: a study of New Zealand worker experiences", *Asia Pacific Journal of Human Resources*, Vol. 46 No. 1, pp. 38-55.

Mellat-Parast, M., Adams, S.G. and Jones, E.C. (2011), "Improving operational and business performance in the petroleum industry through quality management", *International Journal of Quality & Reliability Management*, Vol. 28 No. 4, pp. 426-450.

Melnyk, S.A., Stewart, D.M. and Swink, M. (2004), "Metrics and performance measurement in operations management: dealing with the metrics maze", *Journal of Operations Management,* Vol. 22 No. 3, pp. 209-217.

Muthén, L.K. and Muthén, B.O. (2015), *Mplus User's Guide*. Seventh Edition, Muthén & Muthén, Los Angeles, CA.

Nair, A. (2006), "Meta-analysis of the relationship between quality management practices and firm performance-implications for quality management theory development", *Journal of Operations Management,* Vol. 24 No. 6, pp. 948-975.

Neely, A. (2005), "The evolution of performance measurement research: developments in the last decade and a research agenda for the next", *International Journal of Operations & Production Management*, Vol. 25 No. 12, pp. 1264-1277.

Nisar, T. M., Kumar, N. and Prabhakar, G. (2019), "Effect of best management practices on the performance and productivity of small firms", *Production Planning & Control*, Vol. 30 No. 10-12, pp. 919-934.

Ødegaard, F. and Roos, P. (2014), "Measuring the contribution of workers' health and psychosocial work-environment on production efficiency", *Production and Operations Management*, Vol. 23 No. 12, pp. 2191-2208.

Ooi, K.B., Lee, V.H., Chong, A.Y.L. and Lin, B. (2013), "Does TQM improve employees' quality of work life? Empirical evidence from Malaysia's manufacturing firms", *Production Planning & Control*, Vol. 24 No. 1, pp. 72-89.

Oppenauer, V. and Van De Voorde, K. (2018), "Exploring the relationships between high involvement work system practices, work demands and emotional exhaustion: a multi-level study", *The International Journal of Human Resource Management*, Vol. 29 No. 2, pp. 311-337.

Opstrup, N., and Pihl-Thingvad, S. (2018), "Does setting goals and incentivizing results matter for the psychosocial work environment?" *Public Performance & Management Review*, Vol. 41 No. 4, pp. 815-834.

Ostroff, C. and Bowen, D.E. (2000), "Moving HR to a higher level: HR practices and organizational effectiveness", in Klein, K.J. and Kozlowski, S.W.J. (Eds), *Multilevel Theory, Research, and Methods in Organizations*, Jossey-Bass, San Francisco, CA, pp. 211-266.

Parker, S.K. (2003), "Longitudinal effects of lean production on employee outcomes and the mediating role of work characteristics", *Journal of Applied Psychology*, Vol. 88 No. 4, pp. 620-634.

Pavlov, A., Mura, M., Franco, M. and Bourne, M. (2017), "Modelling the impact of performance management practices on firm performance: interaction with human resource management practices", *Production Planning & Control*, Vol. 28 No. 5, pp. 431-443.

Peccei, R. and Van De Voorde, K. (2019), "The application of the multilevel paradigm in human resource management–outcomes research: taking stock and going forward", *Journal of Management,* Vol. 45 No. 2, pp. 786-818.

Perales, F. and Tomaszewski, W. (2016), "Happier with the same: job satisfaction of disadvantaged workers", *British Journal of Industrial Relations*, Vol. 54 No. 4, pp. 685-708.

Pichler, S., Beenen, G. and Wood, S. (2018), "Feedback frequency and appraisal reactions: a meta-analytic test of moderators", *The International Journal of Human Resource Management*, doi: 10.1080/09585192.2018.1443961

Pick, D. and Teo, S. T. (2017), "Job satisfaction of public sector middle managers in the process of NPM change", *Public Management Review*, Vol. 19 No. 5, pp. 705-724.

Prajogo, D.I. and McDermott, C.M. (2005), "The relationship between total quality management practices and organizational culture", *International Journal of Operations & Production Management*, Vol. 25 No. 11, pp. 1101-1122.

Saari, L.M. and Judge, T.A. (2004), "Employee attitudes and job satisfaction", *Human Resources Management*, Vol. 43 No. 4, pp. 395-407.

Sanda, M.A. and Kuada, J. (2016), "Influencing dynamics of culture and employee factors on retail banks' performances in a developing country context, *Management Research Review*, Vol. 39 No. 5, pp. 599-628.

Saunila, M., Pekkola, S. and Ukko, J. (2014), "The relationship between innovation capability and performance. The moderating effect of measurement", *International Journal of Productivity and Performance Management*, Vol. 63 No. 2, pp. 234-249.

Schaufeli, W.B. and Bakker, A.B. (2004), "Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study", *Journal of Organizational Behavior*, Vol. 25 No. 3, pp. 293-315.

Sirmon, D, Hitt, M. and Ireland, R. (2007), "Managing firm resources in dynamic environments to create value: looking inside the black box", *Academy of Management Review*, Vol. 32 No. 1, pp. 273-292.

Smith, M., and Bititci, U.S. (2017), "Interplay between performance measurement and management, employee engagement and performance", *International Journal of Operations & Production Management*, Vol. 37 No. 9, pp. 1207-1228.

Smulders, P.G. and Nijhuis, F.J. (1999), "The job demands-job control model and absence behaviour: results of a 3-year longitudinal study", *Work & Stress*, Vol. 13 No. 2, pp. 115-131.

Soltani, E., and Wilkinson, A. (2018), "TQM and performance appraisal: complementary or incompatible?", *European Management Review*. DOI: 10.1111/emre.12317

Soltani, E., Lai, P.C. and Phillips, P. (2008), "A new look at factors influencing total quality management failure: work process control or workforce control?", *New Technology, Work and Employment,* Vol. 23 No. 1-2, pp. 125-142.

Sprigg, C.A. and Jackson, P.R. (2006), "Call centers as lean service environments: job-related strain and the mediating role of work design", *Journal of Occupational Health Psychology*, Vol. 11 No. 2, pp. 197-212.

Taris, T.W. and Schreurs, P.J. (2009), "Well-being and organizational performance: an organizational-level test of the happy-productive worker hypothesis", *Work & Stress*, Vol. 23 No.2, pp.120-136.

Trivellas, P. and Santouridis, I. (2016), "Job satisfaction as a mediator of the relationship between service quality and organisational commitment in higher education. An empirical study of faculty and administration staff", *Total Quality Management & Business Excellence*, Vol. 27, No. 1-2, pp. 169-183.

Tuckey, M.R., Bakker, A.B. and Dollard, M.F. (2012), "Empowering leaders optimize working conditions for engagement: a multilevel study", *Journal of Occupational Health Psychology*, Vol. 17 No. 1, pp. 15-27.

Tumen S. and Zeydanli, T. (2016), "Social interactions in job satisfaction", *International Journal of Manpower*, Vol. 37 No. 3, pp. 426-455.

Tweedie, D., Wild, D., Rhodes, C. and Martinov-Bennie, N. (2019), "How does performance management affect workers? Beyond human resource management and its critique", *International Journal of Management Reviews*, Vol. 21 No. 1, pp. 76-96.

Ukko, J., Tenhunen, J. and Rantanen, H. (2007), "Performance measurement impacts on management and leadership: perspectives of management and employees", *International Journal of Production Economics*, Vol. 110 No. 1, pp. 39-51.

Van De Voorde, K., Paauwe, J., and Van Veldhoven, M. (2012), "Employee well-being and the HRM–organizational performance relationship: a review of quantitative studies", *International Journal of Management Reviews*, Vol. 14 No. 4, pp. 391-407.

Van De Voorde, K., Veld, M. and Van Veldhoven, M. (2016), "Connecting empowerment-focused HRM and labour productivity to work engagement: the mediating role of job demands and resources", *Human Resource Management Journal*, Vol. 26 No. 2, pp. 192-210.

Van der Stede, W.A., Chow, C.W. and Lin, T.W. (2006), "Strategy, choice of performance measures, and performance", *Behavioral Research in Accounting*, Vol. 18 No. 1, pp. 185-205.

Van Waeyenberg, T., Decramer, A., Desmidt, S. and Audenaert, M. (2017), "The relationship between employee performance management and civil servants' turnover intentions: a test

of the mediating roles of system satisfaction and affective commitment", *Public Management Review*, Vol. 19 No. 6, pp. 747-764.

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.

Van Yperen, N. W. and Hagedoorn, M. (2003), "Do high job demands increase intrinsic motivation or fatigue or both? The role of job control and job social support", *Academy of Management Journal*, Vol. 46 No. 3, pp. 339-348.

Verbeeten, F.H.M. and Speklé, R.F. (2015), "Management control, results-oriented culture and public sector performance: empirical evidence on new public management", *Organization Studies*, Vol. 36 No. 7, pp. 953-978.

Walker, R.M., Damanpour, F. and Devece, C.A. (2010), "Management innovation and organizational performance: the mediating effect of performance management", *Journal of Public Administration Research and Theory*, Vol. 21 No. 2, pp. 367-386.

Waring, J.J. and Bishop, S. (2010), "Lean healthcare: rhetoric, ritual, resistance", *Sociology of Health and Illness*, Vol. 33 No. 5, pp. 661-676.

Warr, P., Cook, J. and Wall, T. (1979), "Scales for the measurement of some work attitudes and aspects of psychological well-being", *Journal of Occupational Psychology*, Vol. 52 No. 2, pp. 129-148.

Warr, P. (1990), "The measurement of well-being and other aspects of mental health", *Journal of Occupational Psychology*, Vol. 63 No. 3, pp. 193-210.

Wong, S.S., DeSanctis, G. and Staudenmayer, N. (2007), "The relationship between task interdependency and role stress: a revisit of the job demands–control model", *Journal of Management Studies*, Vol. 44 No. 2, pp. 284-303.

Wood, S. and de Menezes, L.M. (2011), "High involvement management, high performance work systems and well-being", *International Journal of Human Resource Management*, Vol. 22 No. 7, pp. 1586-1610.

Wood, S. and Ogbonnaya, C. (2018), "High-involvement management, economic recession, well-being, and organizational performance", *Journal of Management*, Vol. 44 No. 8, pp. 3070-3095.

Wood, S., Van Veldhoven, M., Croon, M. and de Menezes, L.M. (2012), "Enriched job design, high involvement management and organizational performance: the mediating roles of job satisfaction and well-being", *Human Relations,* Vol. 65 No. 4, pp. 419-445.

Wu, N., Hoque, K., Bacon, N. and Bou, J.C. (2015), "High-performance work systems and workplace performance in small, medium-sized and large firms", *Human Resource Management Journal*, Vol. 25 No. 4, pp. 408-423.

Appendix

Table A

Table 1. Performance Management in Quality Management

	Definition	Supporting Literature
Quality-planning	A systematic approach to planning that helps all departments, teams and individuals in the organisation to: clarify their central purpose, specify and deploy clear targets. It also entails communication of mission statements and goals, which are then cascaded to individual workers.	Mellat-Parast et al. (2011), Ebrahimi and Sadeghi (2013), Laosirihongthong et al. (2013), Hietschold et al. (2014), Decramer et al. (2015), Franco and Doherty (2017), Pavlov et al. (2017)
Information & Analysis	The monitoring of internal results, fact-based decision making, performance-tracking via key indicators, benchmarking and regular meetings to review performance.	

Table 2. Sample Characteristics

Workplaces (n=1,917)	
Variables	**Frequency (%)**
Size of the whole organisation	
<100 employees	28.2
100-999 employees	19.8
1000 or more employees	52.0
Size of the workplace	
5-9 employees	10.7
10-49 employees	33.3
50-249 employees	30.5
250 or more	25.5
Industry	
Manufacturing (reference category)	9.5
Electricity, gas and water	1.7
Construction	3.4
Wholesale and retail trade	10.2
Hotels and restaurants	5.3
Transport and communications	6.2
Financial services	1.1
Other business services	12.2
Public administration	9.5
Education	14.7
Health and social work	16.6
Other community services	9.6
Ownership of workplaces	
Public sector	32.8
Private sector	67.2
Employees (n=21,836)	
Variables	**Frequency (%)**
Age	
16-19 years	2.0
20-21 years	2.0
22-29 years	14.4
30-39 years	21.1
40-49 years	28.2
50-59 years	24.4
60-64 years	6.0
65 or more	1.9
Gender	
Male	43.8
Female	56.2
Tenure	
<1 year	11.3
1≤year<2	9.7
2≤year<5	24.1
5≤year<10	24.3
≥ 10 years	30.6
Being a supervisor	32.9
On or below minimum wage	21.2

Table 3. Variables and Measures

WORKPLACE -LEVEL (WERS2011 Management Survey)		
Variable	**Question Extracted**	**Measure**
Quality-Planning		
Targets	Does the workplace have targets for any of the following? (YES=1/NO=0) 1. Volume of sales/services provided 2. Total costs 3. Profits/return on investments 4. Unit labour costs 5. Productivity 6. Quality of product and service 7. Customer/client satisfaction 8. Labour turnover 9. Absenteeism 10. Workforce training 11. Employee job satisfaction	Factor based on 2 dimensions: -Performance-related targets: mean of items 1-7 -Work-force related targets: mean of items 8-11
Strategy dissemination	Does management regularly give employees (or their representatives) any information about: internal investment plans, the financial position of the workplace, or staffing plans? (YES=1/NO=0)	Mean of the response to the 3 questions
	Is this workplace covered by a formal strategic plan which sets out objectives and how they will be achieved? (YES=1/NO=0)	
	Do you have meetings between line managers or supervisors and all the workers for whom they are responsible? (YES=1/NO=0)	
Information & Analysis		
Keeping records	Are any of the following records kept for this workplace? (YES=1/NO=0) 1. Sales 2. Costs 3. Profits 4. Productivity 5. Quality of products or services 6. Labour turnover 7. Absenteeism 8. Workforce training	Factor based on 2 dimensions: -Performance-related records: mean of items 1-5 -Work-force related records: mean of items 6-8
Analysing records	Over the last two years, has this workplace benchmarked itself against any other workplaces?(YES=1/NO=0)	Mean of the response to the 2 questions
	Do you have groups of non-managerial employees that solve specific problems or discuss aspects of performance or quality? (YES=1/NO=0)	
Monitoring customer feedback	Are customer surveys or feedback, records on levels of faults, complaints used to monitor the quality of the work? (YES=1/NO=0)	Binary response to the question
Monitoring employee-performance	What proportion of non-managerial employees at this workplace have their performance formally appraised?	Binary variable: 100% of non-managerial employees have the performance appraised taking employee-training needs into consideration
	Does the performance appraisal result in an evaluation of employee's training needs? (YES=1/NO=0)	
Performance		
Productivity	Compared with other workplaces in the same industry how would you assess your workplace's labour productivity? (1=lot below average, 5=lot better than average)	4-point scale measure (1=below average, 4=a lot better than average)
Quality of products or services	Compared with other workplaces in the same industry how would you assess your workplace's quality of product or service?(1=lot below average, 5=lot better than average)	4-point scale measure (1=below average, 4=a lot better than average)

EMPLOYEE-LEVEL (WERS2011 Employee Survey)		
Variables	**Questions**	**Measures**
Job satisfaction	How satisfied are you with the following aspects of your job? (1=very dissatisfied, 5=very satisfied) 1. The sense of achievement they get from their work 2. The scope for using initiative 3. The amount of influence the person has over their job 4. The training the person received 5. The opportunity to develop their skills in their job 6. The amount of pay they receive 7. Job security 8. The work itself 9. The amount of involvement in decision-making	5-point scale measure: mean score of items 1-9
Job control	In general, how much influence do you have over the following? (1=none, 4=a lot) 1. The tasks they do in their job 2. The pace at which they work 3. How they do their work 4. The order in which they carry out tasks 5. The time they start or finish their working day	4-point scale measure: mean score of items 1-5
Job demands	Do you agree or disagree with the following statements about your job? (1=strongly disagree, 4=strongly agree) 1. My job requires that I work very hard 2. I never seem to have enough time to get my work done	5-point scale measure: mean score of items 1-2

Source: https://www.gov.uk/government/publications/the-2011-workplace-employment-relations-study-wers

Table 4. Correlations

Variables	1	2	3	4	5	6	7	8	9	10	11
Workplace-level											
1. Targets	1										
2. Strategy dissemination	.346**	1									
3. Keeping records	.489**	.172**	1								
4. Analysing records	.320**	.377**	.177**	1							
5. Monitoring customer feedback	.093**	.016	.088**	-.023	1						
6. Monitoring employee-performance	.044	.028	-.002	-.055*	.050*	1					
7. Workplace job satisfaction	-.162**	-.128**	-.038	-.066**	-.074**	-.019	1				
8. Workplace job control	-.168**	-.117**	-.056*	-.092**	.030	.045	.486**	1			
9. Workplace job demands	-.057*	.177**	-.034	.130**	-.064**	-.056*	-.082**	.030	1		
10. Productivity	.029	.055*	.034	.039	-.040	.077**	.124**	.041	-.008	1	
11. Quality of products/services	.030	.014	.060*	-.006	-.026	.099**	.194**	.065**	-.038	.402**	1
Employee-level	1	2	3								
1. Job satisfaction	1										
2. Job control	.471**	1									
3. Job demands	-.048**	.036**	1								

$n_{workplace\text{-}level}$= 1,917 ; $n_{employee\text{-}level}$ =21,836

** $p < 0.01$; * $p < 0.05$

Table 5. Quality-planning - Main Paths in Models

	Productivity		Quality of products/services	
WORKPLACE-LEVEL	Coefficient (b)	p-value	Coefficient (b)	p-value
Direct Effects				
Targets → Performance	-.710	0.28	-.205	0.74
Strategy dissemination → Performance	1.743*	0.02	1.174	0.08
Workplace job satisfaction → Performance	.680**	0.00	1.006**	0.00
Workplace job control → Performance	-.079	0.65	-.290	0.07
Workplace job demands → Performance	.064	0.65	.106	0.46
Targets → Workplace job satisfaction	.042	0.61	.032	0.71
Strategy dissemination → Workplace job satisfaction	-.014	0.86	-.003	0.97
Workplace job control → Workplace job satisfaction	.461**	0.00	.461**	0.00
Workplace job demands → Workplace job satisfaction	-.138**	0.00	-.138**	0.00
Targets → Workplace job control	-.236*	0.03	-.240*	0.03
Strategy dissemination → Workplace job control	.058	0.57	.060	0.55
Targets → Workplace job demands	-.315**	0.00	-.321**	0.00
Strategy dissemination → Workplace job demands	.290**	0.00	.292**	0.00
Indirect Effects				
Targets → Workplace job satisfaction → Performance	.029	0.62	.032	0.71
Targets → Workplace job control → Performance	.019	0.66	.070	0.18
Targets → Workplace job demands → Performance	-.020	0.65	-.034	0.47
Targets → Workplace job control → Workplace job satisfaction →Performance	-.074	0.06	-.111*	0.04
Targets → Workplace job demands → Workplace job satisfaction → Performance	.029*	0.03	.045*	0.01
Strategy dissemination → Workplace job satisfaction → Performance	-.010	0.86	-.003	0.97
Strategy dissemination → Workplace job control → Performance	-.005	0.74	-.018	0.58
Strategy dissemination → Workplace job demands → Performance	.019	0.65	.031	0.46
Strategy dissemination → Workplace job control → Workplace job satisfaction → Performance	.018	0.57	.028	0.55
Strategy dissemination → Workplace job demands → Workplace job satisfaction → Performance	-.027*	0.03	-.041*	0.01
Targets → Workplace job control → Workplace job satisfaction	-.109*	0.03	-.109*	0.03
Targets → Workplace job demands → Workplace job satisfaction	.044*	0.01	.044*	0.01
Strategy dissemination → Workplace job control → Workplace job satisfaction	.027	0.57	.028	0.55
Strategy dissemination → Workplace job demands → Workplace job satisfaction	-.040*	0.01	-.040*	0.01
Moderation				
Workplace job demands x Workplace job control → Workplace job satisfaction	.054	0.45	.054	0.45
EMPLOYEE-LEVEL				
Job control → Job satisfaction	.432**	0.00	.432**	0.00
Job demands → Job satisfaction	-.058**	0.00	-.058**	0.00
Job control x Job demands → Job satisfaction	.047**	0.00	.047**	0.00

** $p \leq 0.01$; * $p \leq 0.05$

Table 6. Information & Analysis - Main Paths in Models

	Productivity		Quality of products/services	
WORKPLACE-LEVEL	Coefficient (b)	p-value	Coefficient (b)	p-value
Direct Effects				
Keeping records → Performance	1.295*	0.01	.123	0.82
Analysing records → Performance	.050	0.87	.586*	0.05
Monitoring customer feedback → Performance	-.115	0.29	-.182	0.08
Monitoring employee-performance → Performance	.335*	0.01	.529**	0.00
Workplace job satisfaction → Performance	.972**	0.00	1.147**	0.00
Workplace job control → Performance	-.129	0.50	-.364*	0.03
Workplace job demands → Performance	.228	0.16	.110	0.50
Keeping records → Workplace job satisfaction	-.074	0.36	-.076	0.35
Analysing records → Workplace job satisfaction	.058	0.16	.058	0.16
Monitoring customer feedback → Workplace job satisfaction	-.014	0.40	-.014	0.40
Monitoring employee-performance → Workplace job satisfaction	-.005	0.81	-.005	0.81
Workplace job control → Workplace job satisfaction	.421**	0.00	.421**	0.00
Workplace job demands → Workplace job satisfaction	-.125**	0.00	-.125**	0.00
Keeping records → Workplace job control	-.282**	0.00	-.284**	0.00
Analysing records → Workplace job control	.078	0.13	.078	0.13
Monitoring customer feedback → Workplace job control	.027	0.15	.027	0.15
Monitoring employee-performance → Workplace job control	.009	0.69	.009	0.69
Keeping records → Workplace job demands	-.223*	0.03	-.226*	0.03
Analysing records → Workplace job demands	.090	0.09	.091	0.09
Monitoring customer feedback → Workplace job demands	.007	0.70	.007	0.70
Monitoring employee-performance → Workplace job demands	-.011	0.61	-.011	0.61
Indirect Effects				
Keeping records → Workplace job satisfaction → Performance	-.072	0.37	-.087	0.35
Keeping records → Workplace job control → Performance	.036	0.51	.103	0.07
Keeping records → Workplace job demands → Performance	-.051	0.24	-.025	0.51
Keeping records → Workplace job control → Workplace job satisfaction → Performance	-.116**	0.01	-.137**	0.00
Keeping records → Workplace job demands → Workplace job satisfaction → Performance	.027	0.06	.033	0.06
Analysing records → Workplace job satisfaction → Performance	.056	0.18	.066	0.17
Analysing records → Workplace job control → Performance	-.010	0.53	-.028	0.23
Analysing records → Workplace job demands → Performance	.021	0.27	.010	0.52
Analysing records → Workplace job control → Workplace job satisfaction → Performance	.032	0.14	.038	0.14
Analysing records → Workplace job demands → Workplace job satisfaction → Performance	-.011	0.14	-.013	0.13
Monitoring customer feedback → Workplace job satisfaction → Performance	-.013	0.40	-.016	0.40
Monitoring customer feedback → Workplace job control → Performance	-.003	0.54	-.010	0.23
Monitoring customer feedback → Workplace job demands → Performance	.002	0.72	.001	0.74
Monitoring customer feedback → Workplace job control → Workplace job satisfaction → Performance	.011	0.16	.013	0.16
Monitoring customer feedback → Workplace job demands → Workplace job satisfaction → Performance	-.001	0.70	-.001	0.70
Monitoring employee-performance → Workplace job satisfaction → Performance	-.005	0.81	-.006	0.81
Monitoring employee-performance → Workplace job control → Performance	-.001	0.73	-.003	0.69

Monitoring employee-performance → Workplace job demands → Performance	-.003	0.62	-.001	0.69
Monitoring employee-performance → Workplace job control → Workplace job satisfaction → Performance	.004	0.69	.004	0.69
Monitoring employee-performance → Workplace job demands → Workplace job satisfaction → Performance	.001	0.61	.002	0.61
Keeping records → Workplace job control → Workplace job satisfaction	-.119**	0.00	-.119**	0.00
Keeping records → Workplace job demands → Workplace job satisfaction	.028*	0.05	.028*	0.05
Analysing records → Workplace job control → Workplace job satisfaction	.033	0.13	.033	0.13
Analysing records → Workplace job demands → Workplace job satisfaction	-.011	0.12	-.011	0.12
Monitoring customer feedback → Workplace job control → Workplace job satisfaction	.011	0.15	.011	0.15
Monitoring customer feedback → Workplace job demands → Workplace job satisfaction	-.001	0.70	-.001	0.70
Monitoring employee-performance → Workplace job control → Workplace job satisfaction	.004	0.69	.004	0.69
Monitoring employee-performance → Workplace job demands → Workplace job satisfaction	.001	0.61	.001	0.61
Moderation				
Workplace job demands x Workplace job control → Workplace job satisfaction	-.011	0.90	-.011	0.90
EMPLOYEE-LEVEL				
Job control → Job satisfaction	.436**	0.00	.436**	0.00
Job demands → Job satisfaction	-.052**	0.00	-.052**	0.00
Job control x Job demands → Job satisfaction	.049**	0.00	.049**	0.00

** $p \leq 0.01$; * $p \leq 0.05$

Table 7: Summary

Hypotheses	Results	Previous Findings Supported	Differences from Previous Studies
H1: Positive association between performance management and performance	Partially supported: direct association between strategy dissemination, keeping records, or monitoring employee-performance and productivity, as well as monitoring employee-performance or analysing records and quality of products/services	• Variations in performance management explain differences in productivity (Bloom and Van Reenen, 2010) • Positive correlation between performance management and productivity and quality (Leeuw and van den Berg, 2011) • Strategy dissemination is important for performance (Ukko et al., 2007; Bourne et al., 2013) • Monitoring individual performance may impact quality of products/services (Pavlov et al., 2017) • Not all aspects of Quality-planning are related with performance (Boyne and Gould-William, 2003)	In contrast with findings by: • Pavlov et al. (2017), direct associations between targets and quality of products/ services are not observed; • Verbeeten and Speklé (2015), performance is independent of targets.
H2a: Indirect effects of performance management on performance via perceptions of work conditions	Not supported: some associations between some performance management practices (strategy dissemination, targets and keeping records) and work conditions (job control and job demands), but no association between perceptions of work conditions and performance	• Strategy dissemination is positively correlated with perceptions of job demands (Conway et al., 2016).	In contrast with findings by: • Bititci et al. (2006), targets and keeping records may reduce perceptions of job control; • Franco and Doherty (2017), targets and keeping records may reduce perceptions of job demands; • Opstrup and Pihl-Thingvad (2018), targets are not associated with job satisfaction. Rather than a direct pathway to performance, as in most studies (e.g. Pavlov et al., 2007), a double mediation via perceptions of work conditions and job satisfaction is observed.
H2b: Indirect effects of performance management on performance via job satisfaction	Not supported: job satisfaction associated with performance, but no association between performance management and job satisfaction	• Job satisfaction is positively correlated with performance (e.g. Taris and Schreurs, 2009; Bryson et al., 2017)	
H3: Positive indirect effects of performance management on job satisfaction via job control	Not supported: negative indirect association with targets or keeping records	• Perceptions of work conditions may explain employee-wellbeing (Sanda and Kuada, 2016; Franco and Doherty, 2017).	
H4: Negative indirect effects of performance management on job satisfaction via job demands	Partially supported: positive indirect association between targets or keeping records and job satisfaction; negative indirect association between strategy dissemination and job satisfaction		
H5: Negative association between job demands and job satisfaction moderated by job control	Supported at employee-level	• Negative association between employee perceptions of job demands and job satisfaction (Wood and de Menezes 2011; van Wanrooy et al., 2013). • Positive association between employee job control and job satisfaction (Macky and Boxall, 2008; Boxall et al., 2015). • Job control can counterbalance negative effects of job demands (Wong et al., 2007; Conway et al., 2016).	

Table A. Percentage of use of Performance Management Practices, and Correlation among Individual Items

Item	% of use	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1. Volume of sales/services produced targets	58.2%	1																									
2. Total costs targets	56.78%	.670**	1																								
3. Profits targets	43.01%	.775**	.706**	1																							
4. Unit labour costs targets	35.25%	.550**	.766**	.656**	1																						
5. Productivity targets	46.52%	.467**	.542**	.484**	.615**	1																					
6. Quality of products/services targets	57.67%	.357**	.470**	.370**	.479**	.612**	1																				
7. Customer satisfaction targets	47.15%	.472**	.450**	.532**	.424**	.477**	.630**	1																			
8. Labour turnover targets	28.39%	.468**	.592**	.527**	.640**	.488**	.450**	.538**	1																		
9. Absenteeism targets	51.60%	.153**	.470**	.158**	.411**	.455**	.464**	.439**	.682**	1																	
10. Workforce training targets	38.34%	.318**	.475**	.347**	.485**	.384**	.502**	.520**	.681**	.607**	1																
11. Employee job satisfaction targets	31.38%	.362**	.534**	.392**	.530**	.475**	.591**	.724**	.660**	.589**	.579**.	1															
12. Information disclosure	87.42%	.131**	.249**	.127**	.201**	.279**	.348**	.228**	.260**	.395**	.268**	.306**	1														
13. Formal strategic plan	84.23%	.127**	0.322**	.171**	.233**	.368**	.514**	.417**	.399**	.610**	.459**	.467**	.533**	1													
14. Team briefings	85.79%	.116**	.299**	.161**	.200**	.299**	.381**	.313**	.270**	.426**	.296**	.278**	.339**	.604**	1												
15. Records on sales	87.62%	.546**	.423**	.547**	.307**	.056	.059	.236**	.248**	-.014	.177**	.112*	.064	-.037	-.080	1											
16. Records on costs	89.35%	.316**	.500**	.494**	.413**	.212**	.140**	.228**	.299**	.080	.191**	.165**	.072	-.002	.072	.692	1										
17. Records on profits	63.60%	.541**	.333**	.769**	.365**	.183**	-.015	.239**	.259**	-.248**	.065	.100**	-.2215**	-.3315**	-.198**	.688**	.698**	1									
18. Records on productivity	60.52%	.434**	.442**	.448**	.502**	.741**	.405**	.424**	.393**	.323**	.313**	.432**	.149**	.217**	.146**	.295**	.429**	.442**	1								
19. Records on quality of product/service	70.23%	.374**	.362**	.353**	.418**	.524**	.632**	.502**	.345**	.2705**	.391**	.399**	.261**	.374**	.308**	.312**	.414**	.273**	.698**	1							
20. Records on labour turnover	71.85%	.371**	.442**	.419**	.366**	.351**	.331**	.352**	.706**	.412**	.397**	.377**	.206**	.327**	.298**	419**	.576**	.352*	.532**	.531**	1						
21. Records on absenteeism	88.77%	.169**	.209**	.128**	.231**	.346**	.349**	.216**	.414**	.622**	.342**	.292**	.187**	.368**	.291**	.310**	.396**	.048	.411**	.437**	.737**	1					
22. Records on workforce training	87.68%	.236**	.366**	.217**	.269**	.357**	.441**	.359**	.479**	.458**	.580**	.307**	.248**	.413**	.373**	.299**	.436**	.094*	.456**	.595**	.593**	.756**	1				
23. Benchmarking	59.48%	.063	.228**	.043	.206**	.296**	.406**	.340**	.326**	.399**	.329**	.380**	.349**	.518**	.400**	.087	.092	-.170**	.166**	.280**	.227**	.286**	.337**	1			
24. Quality circles	31.26%	.103**	.195**	.037	.114	.247**	.306**	.194**	.210**	.335**	.189**	.276**	.444**	.399**	.456**	-.033	.142**	-.168**	.221**	.337**	.256**	.252**	.238**	.360**	1		
25. Monitoring customer feedback	44.10%	.119**	.027	.147**	.045	.071	.045	.253**	.072	.101**	-0.003	.139**	-.042	.107*	.029	.023	.007	.1148**	.115**	.159**	0.08*	.083	.072	-.060	.013	1	
26. Monitoring employee-performance	81.37%	-.001	.021	.000	.035	.004	-.000	.121**	.089	.065	.076	.082	.046	.130*	-.026	-.106	-.103	-.042	.010	-.019	.063	-.059	-.016	-.142**	-.023	.092*	1

Pairwise; ** p< 0.01; * p< 0.05

Figure 1. Direct and Indirect Pathways to Performance

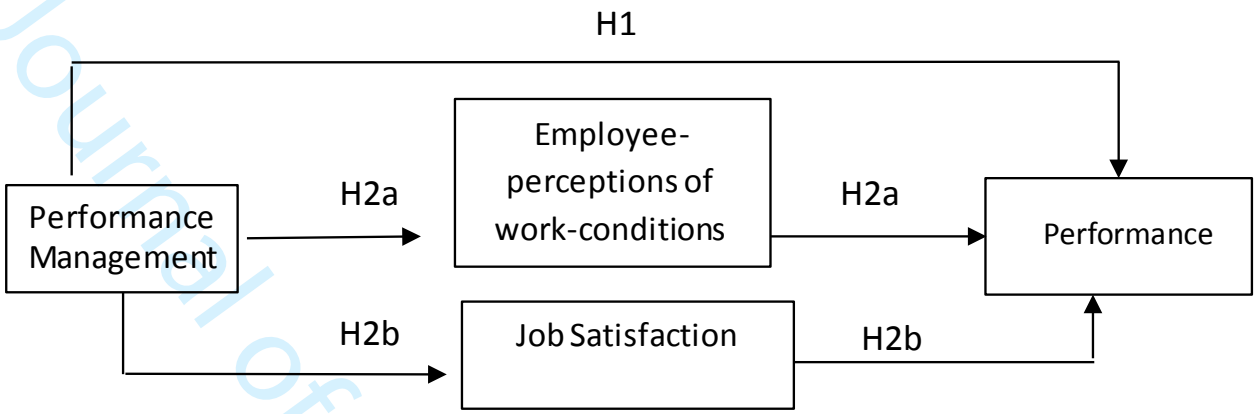

Figure 2. From Performance Management to Performance