CENTRE *for* ECONOMIC
PERFORMANCE

CEP Discussion Paper No 1097

November 2011

HRM and Workplace Motivation: Incremental and Threshold Effects

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Abstract
The HRM-performance linkage often invokes an assumption of increased employee commitment to the organization and other positive effects of a motivational type. We present a theoretical framework in which motivational effects of HRM are conditional on its intensity, utilizing especially the idea of HRM 'bundling'. We then analyse the association between HRM practices and employees' organisational commitment (OC) and intrinsic job satisfaction (IJS). HRM practices have significantly positive relationships with OC and IJS chiefly at high levels of implementation, but with important distinctions between the domain-level analysis (comprising groups of practices for specific domains such as employee development) and the across-domain or HRM-system level. Findings support a threshold interpretation of the link between HRM domains and employee motivation, but at the system-level both incremental and threshold models receive some support.

1.   Introduction

Since the mid-1980s there has been considerable interest in the idea that firms can improve their performance by harnessing the commitment of their employees through human resource management (HRM) practices capable of transforming the workplace (e.g., Beer et al. 1984, 1985; Kochan and Osterman 1994; Pfeffer 1998; Walton 1985, 1987). Despite an extensive literature establishing associations between HRM practices and organizational performance scholars have frequently pointed to difficulties in establishing a causal linkage (e.g., Cappelli and Neumark 2001; Guest et al. 2003; Huselid and Becker 1996; Osterman 2006; Wall and Wood 2005; Wright et al. 2005). Many theories of the HRM-performance linkage rest on an assumption that employees have a positive motivational response to HRM practices, but this is rarely tested in studies concerned with firm performance. Our analysis of HRM-motivation linkages helps fill this gap and, if the relationship is shown to be positive, may help explain the HRM-performance relationship. Conversely, if HRM is not accompanied by higher employee motivation, this may stimulate interest in other plausible mechanisms.

Three empirical studies on the HRM-motivation linkage show why more research is needed on this issue. The USA manufacturing study of Appelbaum et al. (2000) provides the *locus classicus* in support of a positive linear relationship between the intensity of 'high performance work systems' (HPWS: a configuration of HRM focusing on participation, skills, and incentives) and measures of motivation. This study simultaneously supported a positive relationship between HPWS and measures of workplace performance. In parallel, however, Ramsay et al. (2000) were producing rather different findings from their large-scale British study. Using three measures of HRM systems, they reported a mixture of positive *and negative* associations across a variety of motivational outcomes. Moreover, Godard (2001), in a national survey of Canadian employees, found support for *non-linear* associations between a composite index of HRM (which he calls 'alternative work practices') and a range of motivational measures. Using a linear-quadratic specification, he showed that up to moderate levels of involvement in HRM, employees had positive motivational attitudes, but at high levels of involvement, their attitudes turned negative.

Some recent studies support the positive and linear HRM-motivation model (Gong et al. 2009; Macky and Boxall 2008; Nishii et al. 2008; Takeuchi et al. 2007; 2009; Whitener 2001 has discordant findings). However, they rely on employees' perceptions to define HRM. They show that when employees have favourable perceptions of workplace practices , they also tend to have relatively high levels of job satisfaction, commitment, or other attitudes indicative of motivation. A drawback of these studies is that one cannot discount the possibility that employee attitudes to HRM and their commitment ratings are driven by unobservable traits, such as the common influence of personality. We therefore adopt the approach common in much of the HRM-performance literature which is concerned with actual organizational practices (irrespective of how viewed by employees) and their effects.

To detect variation in the HRM-motivation relationship and assess whether HRM constitutes an advance of universal applicability we analyse data for the whole market sector. We use the British Workplace Employment Relations Survey of 2004 (WERS), which provides a national probability sample of workplaces with five or more employees, and obtains detailed information on practices from the manager responsible for HR at the workplace. Our measurement of HRM differs from much of the previous literature where the prevailing approach is to select a relatively small number of indicative practices across HRM domains to construct a single system-level index. Instead, and in a similar vein to Godard (2001) and Batt (2002), we represent variation in the intensity of HRM development, with measures that distinguish between low, moderate, and high levels both at the domain level (e.g., participatory practices) and at the across-domain or HRM-system level. The use of

extensive, detailed, descriptive information about practices should contribute to reduction in measurement error and in omitted variable bias.

Using linked employee data we calculate the mean level of motivational attitudes at each workplace. Assuming firms prefer motivation to be high throughout the workplace[1] this is an appropriate measure from the employer policy perspective. The design avoids the danger of common method artefact when the same respondent provides the data both on her own attitudes and on workplace practices (Podsakoff et al. 2003; Wall and Wood 2005; Wright et al. 2005).

We test hypotheses which stem from the HRM-performance literature. As well as the familiar linear specification of the HRM-motivation relationship, we assess various non-linear specifications, including 'threshold' specifications where the motivational effect of HRM changes at certain levels of implementation: these draw on examples or insights from Huselid and Becker (2006), Godard (2001), Guest et al. (2003), and Ichniowski et al. (1997). We distinguish between (1) a hypothesis of positive incremental change whereby each addition to the HRM system provides an increment to employee motivation (2) a hypothesis that HRM practices need to be developed up to some threshold value or critical mass in order to achieve strong positive effects on motivation: this corresponds to the ideas of 'bundling' or 'strategic' development of HRM that are very prominent in the HRM-performance literature; (3 and 4) critical views of HRM that represent it as imposing unwelcome work intensification on employees, which again have an incremental version (Ramsay et al 2000) and a non-linear or threshold version (Godard 2001). We find strong evidence of positive effects, especially of the bundling/strategic forms of HRM, but also some role for incremental effects. Some negative effects on motivational attitudes are also present but they appear to be weak.

The structure of the article is as follows. In section 2, we discuss theory and present hypotheses. Section 3 presents our data and analytical approach. Section 4 presents the results, and section 5 concludes. It should be noted at the outset that we make no claim to identify causal relationships in this study; we use the terms 'association' and 'effect' interchangeably. However, the theories to which we refer are generally causal in nature, and we hope to provide evidence that will contribute, along with other sources, toward assessment of those theories.

2.   Theory

The core motivational idea connected with HRM-performance research is simple and intuitive. If people enjoy using their abilities to the full, and work harder at what they enjoy, they will be motivated to perform at a higher level when given the opportunity to do challenging, enjoyable work. Walton (1972: 71) claims that 'employees want challenge and personal growth'. McDuffie (1995: 201) argues that employees will only offer 'discretionary effort' if they believe, among other things, that 'the company will make a reciprocal investment in their well-being'. Appelbaum et al. (2000: 46) state 'Jobs that are challenging and make use of workers' skills are intrinsically rewarding'. Although the psychological theory implicit in such statements is *not* explicitly discussed[2] they draw on a dominant discourse of positive motivation around HRM. As HRM is designed to provide jobs that are

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[1] Firms might be less concerned with the motivation of employees on temporary contracts, but these form only a small proportion of the workforce in Britain. In any case, background investigation within the present study has shown that mean OC tends to be as high, or higher, in the minority of workplaces that have substantial proportions of temporary employees.

[2] Appelbaum et al. (2000) do discuss several motivational theories, but in an historical review of the pre-HRM period rather than as an explanation of the effects of high performance work systems.

more satisfying and involving for employees it is natural to assume linear increments in motivation as with Appelbaum et al. (2000). But others adopt a 'bundling' or HRM-system view pointing to non-linear effects which occur at particular thresholds (Becker and Huselid 2006; McDuffie 1995). A contrary position adopted by Marxian labor process theorists is that HRM connotes labor intensification and, as such, can have negative incremental effects (eg. Ramsay et al., 2000). Finally there is the non-linear model of Godard (2001) where HRM initially has positive effects but these turn negative at high levels of implementation due to work strain.

Since the work of Foote (1951) identification has been at the center of theories of motivation. Where employees *identify* with the underlying purposes that the HRM system serves or contributes to[3] they are more likely to feel that HRM itself, including its control and coordination aspects, and its associated monitoring and measurement, is also serving their own purposes. (Gagné and Deci 2005; Akerlof and Kranton 2005).   For present purposes the issue is whether identification can be fostered by properties of the HRM system itself.

The issue is further developed by Bowen and Ostroff (2004) (BO), who suggest that HRM can be viewed as a *communication system*, and maintain that 'HRM practices can be viewed as a symbolic or signalling function' (BO: 206). If HRM is to alter employee behaviour and performance, it must be a 'strong system' and the messages it communicates must be persuasive.

BO also emphasize that implementing *a wide range of practices* is valuable in strengthening the HRM message and making it salient. This is consistent with the proposition that impact depends on implementing collections, or 'bundles', of practices. This is partly, we suggest, because isolated practices impose little constraint on the meaning that can be given them. Accordingly, they are likely to be interpreted by employees within established frameworks that (in Britain) are often antagonistic or sceptical. Extensive sets of practices, however, can cumulatively express new organizational values and, because they are founded in practice, these values may have a better chance of being accepted as genuine. In summary, motivation is influenced in a positive direction by sets of practices that provide opportunities for direct participation and voice, and that foster personal development. In combination, these practices encourage employees to do more and to enjoy doing it. But such opportunities are necessarily limited and shaped by the organization's interests and the systems of control and coordination that protect those interests. There are therefore two conflicting interpretations that employees can give to HRM. They can see it as an old reality in new garments; or as representing genuinely new values that are worth identifying with. The effect on motivation will depend on which of these two is the stronger. We suggest that this will vary with the characteristics of the HRM system, especially how intensively it has been developed.

Our review of theory generates two main hypotheses. Hypothesis 1 is that, since HRM promotes intrinsically rewarding work, each addition to an HRM system results in incremental gains in employee motivation. Hypothesis 2 is that motivational effects rely on the employer signalling a strong HRM system so that it has a strong positive effect on employee motivation mainly at high levels of implementation via bundling and workplace transformation. These hypotheses are the motivational equivalents of the main standpoints taken in the HRM-performance literature (Becker and Huselid 2006 seek to reconcile the two). These hypotheses may hold either at the practice-domain level (eg. a suite of practices to train and develop employees may be motivational in its own right) or perhaps only at the bundled HRM-system level (eg. training and development are only effectual when combined with other practice domains such as participation, team working and incentives). The latter

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[3] This 'way out' is from the viewpoint of the employer's interest: identification processes remain open to critique from other viewpoints (e.g. Alvesson and Willmott 2002).

view predominates in the HRM-performance literature but may not hold when considering HRM-motivation. There is also a possibility, indicated by the radical, critical school, that increased HRM, either incrementally or in a bundled system, may generate negative as well as positive motivational effects.

3.   Data, Measures and Analysis Methods

3.1   Data
The Workplace Employment Relations Study 2004 (henceforth, WERS) is a national survey of workplaces with five or more employees, consisting of face-to-face interviews with the senior workplace manager responsible for employee relations, and a self-completion survey of employees. The management survey had an overall response rate of 64 per cent (N=2295). These face-to-face interviews last an average (mean) of 118 minutes (the median being 115 minutes). The employee survey was conducted in the 1,967 workplaces where management agreed to allow a survey of workers. Questionnaires were distributed to a random sample of 25 employees in workplaces with more than 25 workers and to all employees in workplaces with 5-25; employee respondents comprised a mean of 29 per cent of the total workforce per establishment. The present study was confined to market sector workplaces, and the effective samples were 1140 workplaces with 11,854 employee respondents.

The public-use database for WERS includes weights to account for survey design and non-response, and these are available on either an establishment-weighted or employment-weighted basis for analysis of the management interviews.[4] We have used the establishment weights, consistent with an employer policy perspective. Additionally we make an adjustment to take account of sample attrition from absence of linked employee data in some cases.

3.2   Dependent variables
The measures relating to employee motivation are organizational commitment (OC) and intrinsic job satisfaction (IJS). OC is an obvious measure because of the salient position of the commitment concept in the literature on HRM and workplace transformation. Intrinsic job satisfaction is also frequently referred to in that literature, and its use can be supported from psychological theories of basic needs that emphasize autonomy and self-realization. As Gagné and Deci (2005) make clear, the underlying theory identifies motivation with need satisfaction.

The WERS measure of OC (WERS-OC) consists of three items which have counterparts in the widely used six-item Lincoln-Kalleberg measure of affective organizational commitment (see Price 1997 for a history of OC measures). WERS-OC has a reliability (Cronbach alpha) of 0.85.

The WERS-IJS measure has not to our knowledge previously been used although similar measures are encountered in the job satisfaction literature (e.g., Herrbach and Mignonac 2004; Morrison et al. 2005). The WERS employee questionnaire contained seven facet satisfaction items and from these four were selected that are similar to the 'job itself intrinsic satisfaction' subscale of Warr et al. (1979). Their reliability alpha in the survey sample is 0.87. A principal components analysis (Jolliffe 2004) was performed to assess the distinctness of WERS-OC and WERS-IJS items from each other and from other measures of

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satisfaction and well-being. The results (available on request) confirmed their distinctness. Details of the source items and means for these variables are shown in Table 1.

3.3 Measures of HRM practice

As stressed in the introduction, we view HRM as a set of practices that, in principle, can be objectively described. We build up our measures from items that conform to this idea. There are numerous studies that have a similar approach in this respect (e.g., Cappelli and Neumark 2001; Forth and Millward 2004; Godard 2001; Osterman 2000; 2006; Ramsey et al. 2000; Wright et al. 2005; Zatzick and Iverson 2006). The notion of bundling, mentioned in Section Two, has led the great majority of researchers to aggregate item-level data about HRM practices into summative measures. The majority aggregate their items into a single overall measure, while others have aggregation at the level of HRM domains, such as participation or incentives. Our study, like Batt (2002), has aggregate variables at the domain level, but also overall measures which represent the across-domain or system level of HRM development.

Where we depart from most previous research is in how HRM measures are specified for the analysis. Most research on HRM's links to performance and motivation has assumed linearity of HRM effects, which offers a way of testing the incremental effect on motivation but appears inconsistent with the idea of bundling. Becker and Huselid (1998) suggest that additive indices be scored positively only when they reach some cut-off level, such as the 75th percentile. A few studies have adopted *threshold-based measures* along these lines (Guest et al. 2003; Huselid and Becker 1996; Ichniowski et al. 1997).

We construct measures of HRM that represent a wide range of intensity. To achieve this, we used 71 items concerning HRM practice from the managerial interview schedule, focusing on seven domains of practice that are commonly regarded as elements of an HRM system (see later). We did not require every item to refer to practice across all employees. In WERS, many items refer to the 'largest occupational group' of employees, and some apply to 'non-managerial' employees; both these, we judge, provide a reasonable indication of general HRM practice. We excluded, however, items that related only to managerial employees. (The full set of items is available from the authors as an Appendix Table).

Most of the source items were binary; others that had more complex scoring were reduced to binary form. This differs from most US studies of HRM, which have used Likert-scale type source items, or quantified estimates. Binary items have a restricted range by comparison with ordinal, interval, or ratio scales, and this may bias estimates conservatively toward zero. Binary items however also tend to reduce measurement error that may be present in the rating scales. So far, HRM research using binary source items (including numerous British studies using the WERS 1998 and 2004 surveys, e.g. Forth and Millward 2004, Kinnie et al. 2006, Ramsay et al. 2000; see also Wright et al. 2005 for a US study; Zatzick and Iverson 2006 for Canada) have not suffered from inadequate precision.

The allocation of HRM practices to domains was conventional and largely followed the grouping of HRM questions in the survey questionnaires which in turn reflected common understanding of practice in Britain. The items were initially grouped on this basis into seven domains, labelled participation, development, teams, incentives, recruitment, equal opportunities, and family-friendly practice (Table 2). The first five of these presumably require no further explanation, since they occur repeatedly in the literature of HRM. Equal opportunities practices are included to represent fair treatment, and similarly family-friendly practices represent the employer's caring attitude. Although not directly relevant to performance, these two domains of practice are widely recognized as part of HRM practice in Britain and should contribute positively toward the overall HRM climate (Bloom et al., 2011).

Job design is not treated as a domain, but relevant items are included under participation, development, and teams. The grouping of items was checked and adjusted by means of reliability analysis (see Table 2). The Kuder-Richardson reliabilities (closely similar to Cronbach alpha) were in the range 0.63-0.79, except in the case of recruitment (0.52), where the set of items available is somewhat limited. These reliabilities for HRM domain measures are similar to those found in the US HRM-performance literature when descriptive reports of practice are obtained. Four items of the original 71, relating to long-term employment and job security protection were found not to group well as a domain, and were accordingly removed from the aggregated measures, but retained as 'loose' practices, in view of the importance attached to security policy in many discussions of HRM (e.g. Kochan and Osterman 1994). We also included a measure of the form of employee consultation over workplace change, which proved not to group with any domain.

The basic domain scores were formed as the unweighted sums of the binary items. [5] These scores were either used on their own with an interval-scale assumption, or collapsed to derive dummy variables for each domain (a) above the weighted median score, versus at or below the median, (b) the nearest fit to the weighted 80th percentile score, versus below 80th percentile. We will refer to these as 'upper' and 'high' scores, respectively. The 80th percentile cut was selected as the nearest cut that *always* yielded a measure that was distinct from the median cut; it approximates the 75th percentile cut used by Huselid and Becker (1996). Using these cuts, we next constructed a 3-valued measure for each domain, distinguishing between low, moderate and high levels of implementation. To represent the across-domain or 'HRM-system' view, we constructed two further types of measures. One summed the number of domains that were at the 'upper' level / the 'high' level. The other summed the items (practices) across domains into an overall index; this corresponds to the practice of many US studies.

3.4 Control variables

Control variables are included in all the reported analyses. They are: administrative region (11 dummies), the rank of travel-to-work area unemployment rate in 2004, the natural logarithm of number of workplace employees, a four-category dummy indicating size of organization (with single site organization as reference category), industry (12 dummies), the percentage of workplace employees in 'higher' (professional and managerial) occupations, the percentage in 'intermediate' (administrative, technician and craft) occupations, the percentage of female employees, five-banded percentage of employees in non-permanent jobs, and a dummy for presence of recognised union(s).

3.5 Analyses

We use survey regression with a robust variance estimator. We describe how hypotheses are represented in different model specifications in Section Four below. The measures of OC and IJS are treated as continuous variables, since they are smoothly distributed workplace means. The main technical issue concerns the fact that the means of OC and IJS are themselves sample-based estimates: therefore measured with error, and heteroskedastic because the workplace samples vary in size. However, as OC and IJS are always dependent variables, measurement error is incorporated in the usual disturbance term and this does not affect consistency of estimates. The robust variance estimator allows for heteroskedasticity as well as for weighting and stratification.

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[5] We also experimented with ordinal variables, available in WERS, relating to participation (two variables), development (two items), teams (one item), and incentives (one item). Using these in place of the main constructed measures for these domains, and treating them either as interval-scale measures or categorical measures, we found that none was statistically significant.

4.   Results

First we report the results of analyses at the HRM-domain level: these are the building blocks for an overall HRM policy. We then proceed to the results of analyses at the across-domain level, where the explanatory variables sum the extent of development for sets of domains: these are measures of overall HRM intensity, and correspond to the overall indices of practice that have been the predominant approach in the HRM-performance literature. All analyses include the set of control variables described in Section 3.4 but the estimates for the control variables are not shown in the tables. We do not show tables of specifications where all or nearly all estimates for the HRM variables are non-significant (any tables referred to but not shown are available on request from the authors.) We also omit the estimates for the 'loose' practices relating to long-term employment and security, since these have chiefly non-significant effects across all specifications.

4.1   *Domain-level analyses*

First we ran a specification with additive domain scores treated as interval measures. The estimates are therefore of the independent linear effects of each domain. This analysis represents at the HRM-domain level the hypothesis that the effects of HRM practices are incremental, with any increase in the extent of practices in any domain having a positive effect on motivation. None of these linear effects was significant at the five per cent level, either when OC or IJS was the dependent variable; one (for the incentives domain) was significant at the 10 per cent level, with IJS as the dependent variable. There is therefore little support at the domain level for the incremental-effect hypothesis. We also ran a specification with the square of each domain score in addition to the linear term. With OC as the outcome, the model F statistic fell from 6.67 to 5.66, and with IJS as the outcome, from 5.46 to 5.14, suggesting no improvement in the model. One domain measure, selection, showed marked non-linearity across both outcomes: for OC, a linear effect on OC of -0.513 (standard error 0.169), and quadratic effect 0.066 (standard error 0.021), and the corresponding effects on IJS of -0.527 (s.e. 0.224) and 0.064 (s.e. 0.026). There was also some evidence of non-linearity for the development domain for the OC outcome, the quadratic term having an effect of 0.019 with standard error 0.009; the linear parameter estimate was non-significant. Although the remaining domain estimates were non-significant, six of the seven domains had a negative sign on the linear term and positive sign on the quadratic term.

We next turn to specifications where each HRM-domain score is dichotomized at a threshold value. For the first set of results the contrast is between workplaces in the 'upper' half of each score versus those in the lower half, while the second set gives results between workplaces in approximately the top quintile of the score distribution versus those below this threshold. When 'upper' (above median) dummies were used to represent each domain, none of these dummies had a significantly positive coefficient at the ten per cent level; team organization had a significantly *negative* coefficient (at the 10 per cent level). However, when 'high' (at/above 80th percentile) dummies were used for each domain, four of the dummies – those for development, participation, incentives, and teams – were significant at least at the 10 per cent level either with OC or with IJS. This evidence is not strong, but gives some suggestion that the effects of HRM on motivation appear mainly when a high intensity of practices has been reached in certain domains thus supporting the importance of 'bundling'. However, the coefficient for 'high' team practices was *negative* in both the OC and IJS models, and significant at the 10 per cent level in the former. We do not show this table since the next analysis step provides a clearer view of the results.

This next step employs a 3-valued variable taking value 0 when the domain score is 'low' (up to and including the median level), value 1 when it is 'moderate' (above the median

level but below the 80th percentile level), and value 2 when it is 'high' (at/above the 80th percentile).[6] Table 3 shows the resulting estimates, highlighting those for the four HRM domains that had significant estimates. To interpret the estimates quantitatively, in this and subsequent tables, note that the dependent variables are measured in units of the attitudinal response, so the coefficient is the difference in the attitudinal mean per workplace as a proportion of a unit of response.

For three domains (development, participation, and incentives) a 'high' score was associated with significantly higher mean OC than for a 'moderate' score. These are just the domains whose importance was underlined by Appelbaum et al. (2000). For the teams domain, the difference was again marked between a 'high' and 'moderate' score but this time in a negative direction. Differences between 'high' and 'low' were generally less clear than between 'high' and 'moderate'. This pattern was less clear when IJS was the dependent variable, with only two of the domains – participation and incentives – showing significant differences between the 'high' and 'moderate' levels. Overall, however, there is some indication here that a merely 'moderate' level of HRM implementation at the domain level has little motivational return for the employer; the 'bundling' of HRM practices is shown to be important at the within-domain level.

4.2   Across-domain analyses
As explained in Section 3, the across-domain analyses are based on two kinds of summative variable representing overall HRM-system development. First we consider summation of the dummies indicating whether the workplace is at the 'upper' level on each domain, or again those indicating whether the workplace is at the 'high' level. Thus, across the seven domains, there are two alternative scores of 0-7. It may also be argued that two of the domains – family friendly practices and equal opportunities practices – are not usually considered as part of 'high performance' HRM (e.g., as considered in Appelbaum et al. 2000), and their inclusion may dampen the impact of across-domain HRM on motivational outcomes. Indeed, these two domains never had significant effects in the domain-level analyses. In recognition of this objection, we also compute sum variables that omit family-friendly and equal opportunities domains. These summative indices which we label 'HR/HP' therefore take values 0-5. When these HR/HP indices are used, the omitted domains are still present in the specification as separate dummy variables.

Initially we consider these indices as interval measures and estimate linear effects. As noted before, this specification represents an hypothesis of incremental effect at the across-domain level here meaning that each additional domain that is developed to the specified level yields a corresponding increase on the motivational measure. In the upper panel of Table 4, we show the linear trend effects of the indices of 'high' development of domains (the corresponding effects for the indices of 'upper' level development are not shown as they are always non-significant). Those at the 'high' level are always positive and significant at the 10 per cent or 5 per cent level. These results support an incremental hypothesis inasmuch as each additional domain that is developed to a 'high' level contributes toward improved motivational outcomes. Note that the linear trend estimates are considerably higher when analysis is focused on the 5 HR/HP domains rather than considered across all 7 domains.

We next investigated non-linearity of the across-domain effects by adding a quadratic term, the square of the index in question, to the linear trend specification. We do not report the results from these models as the coefficients on both linear and quadratic terms were

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[6] We also constructed 4-value variables where the 'low' category was further divided between workplaces in approximately the lowest third of each domain's score distribution, and those above this but below the cut-off between 'low' and 'moderate'. We do not report results from analyses using this version since they did not yield much further information.

generally non-significant. Additionally, in case the interval scale assumption is too strong for these measures of across-domain practice, we ran further models with the measures represented as categorical by means of dummies for each step on the index. The lower panel of Table 4 shows the estimates from this more flexible specification. Testing the 'flexible' estimates against linear model predictions (by means of Wald tests) failed to reveal any statistically significant departures from linearity. However this specification does provide some further insight. Although at the domain level (Table 3) only three domains were found to have significant and positive effects on OC or IJS, at the across-domain level there are progressively higher effects on motivational attitudes for four, five and all the way up to seven domains developed to the 'high' level. This suggests that the other domains also contribute at the HRM-system level.

Overall, the foregoing results provide support for the incremental hypothesis concerning the effects of HRM practices at the across-domain or system level. However, we have to bear in mind that the linear trend is found *only* when indexing domains that have been developed to the 'high' level, a level that applies to only the 'top' quintile of workplaces in each domain.

Further, it may be that the restricted range of the summed-domain variables (0-7 or 0-5) makes it hard to identify non-linearities. Accordingly, as noted in Section Four, we have also created across-domain measures by summing the individual practices across all seven HRM (variable label TOTHRM) or all five HR/HP domains (variable label TOTHRHP). This generates indices with much extended range (see Table 2). These variables include practices from domains that are developed only to a low or moderate level alongside those from 'high' domains, but of course summed-practice scores are strongly associated with across-domain counts of 'high' development.

Table 5 summarizes the chief results. With a linear trend representation of the summed-practice measures, the estimates are non-significant for both IJS and OC. When a quadratic term is added, both the linear and quadratic terms are significant at least at the 5 per cent level for OC regressed on TOTHRHP, and for IJS regressed either on TOTHRM or TOTHRHP. For OC regressed on TOTHRM, the quadratic term is positive and significant while the linear term is negative but non-significant.

In these specifications, the linear term always has negative sign while the quadratic term always has positive sign. This suggests that workplaces implementing HRM practices or the HR/HP subset to a moderate extent tend to meet on average somewhat negative responses in terms of employee OC and IJS, but this tendency is reversed as the implementation reaches higher levels. With the HR/HP summed-practice measures, OC is predicted to reach a minimum at about 15 practices, and thereafter to increase progressively (The mean marginal predictions, with control variables at their observed values, are plotted in Figure 1). The minimum of IJS is similarly reached at 15 HRHP practices, or at 20 HRM practices, with progressive increases thereafter (Figure 2) .

5.   Conclusions

A positive association between HRM practices and business performance has often been explained via HRM's assumed effect on employee motivation. Yet evidence for this assumption remains scanty and is not wholly consistent. Also, little use has been made of the major insights of the HRM-performance literature concerning the importance of 'bundling', that is of highly developed or intensive HRM systems: the suggestion has been that major effects on performance can only be achieved through workplace transformation, and this is suggestive of non-linear or threshold effects on motivational outcomes. We have pointed to

further theoretical arguments that HRM's effects on employees will depend not only on specific opportunities for participation and personal development, but also on whether the HRM practices in total communicate a transformative development that evokes employee identification.

Using linked employer-employee data for Britain we find no evidence that incremental investments in domain-level HRM elicit incremental increases in employee motivation. Instead, domain-level effects tend to appear only when a high intensity of practices has been reached within a domain. Positive and significant effects are found for 'high' implementation of the developmental, participatory, and incentive domains but the motivational effect of intensive team-working is negative. At the HRM system-level the estimated relationships differ across two kinds of HRM measure. Counting HRM domains that have reached threshold values, we find that OC and IJS increase linearly as more domains are developed to a 'high' level. Counting practices across domains, and hence including practices from less-developed as well as highly-developed domains, we find that workplaces with limited implementation of HRM practices initially meet on average somewhat negative responses in terms of employee OC and IJS, but this tendency is reversed as the implementation becomes more extensive, supporting the contention that employers must signal "strongly" to employees through their HRM system if they are to reap the rewards of improved employee motivation. The pattern of findings also makes it hard to argue that HRM's apparent effects are spurious, with workplaces self-selecting into HRM when they have well-motivated employees. In that case, workplaces with moderate levels of HRM implementation would also show positive effects on OC and IJS.

These findings have practical implications for firms. Low levels of HRM implementation appear to be of little motivational value, at least in the British context where relationships are often adversarial. But there is value in firms developing each selected domain to a high or 'transformative' level since each gives a separate motivational payoff. Then, as more domains are transformed, there will be further incremental gains in the form of more motivational payoff from having a more extensive system.

This research spans the whole market sector in Britain, so its findings have wide generality. However, there would also be interest in disaggregated analyses to examine variations in the effects of HRM for workplaces of different size, for instance. The main limitation of the present research is its use of a single cross-section . We are therefore unable to consider motivational dynamics, such as latency or persistence. This limitation may be overcome in future by the use of workplace panel data.

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Table 1. Organizational Commitment (OC) and Intrinsic Job Satisfaction (IJS)

OC items: To what extent do you agree or disagree …	Values taken	Workplace mean	Workplace s.d.
I share many of the values of my organization		0.4776	0.4773
I feel loyal to my organization	-2 … 2	0.7924	0.4730
I am proud to tell people who I work for		0.6482	0.5451
OC summative measure	-6 … 6	1.932	1.370
IJS items: How satisfied are you with …			
The sense of achievement you get from your work		3.752	0.4551
The scope for using your own initiative	1 … 5	3.823	0.4203
The amount of influence you have over your job		3.591	0.4612
The work itself		3.767	0.4408
IJS summative measure	4 … 20	14.95	1.605

Table 2. Measurement of Human Resource Management (HRM) Practices

Domain measures

Label	No. of items (binary)	Median category[a]	% in 'upper' category[c]	80th percentile category[a]	% in 'high' category[c]	Reliability (KR[b])
Development	11	4	45	7	21	0.73
Participation	11	3	49	7	22	0.79
Teams	7	2	47	4	18	0.69
Incentives	8	1	34	3	22	0.68
Recruitment	7	4	44	5	17	0.52
Family-friendly	10	2	44	4	24	0.63
Equal opportunities	13	0	48	2	22	0.79

Across-domain measures

Label	No. of domains	Mean[e]	Standard deviation[e]
HRM 'upper'[c]	7	4.184	1.981
HRM 'high'[c]	7	2.338	1.875
HR/HP[d] 'upper'[c]	5	2.979	1.516
HR/HP[d] 'high'[c]	5	1.560	1.377
TOTHRM=sum of HRM practices	7	24.64	10.20
TOTHRHP= sum of HR/HP practices	5	19.69	7.73

[a] Category that includes the median / nearest fit to 80th percentile for the domain, from weighted distribution, within the market sector, of each domain score.

[b] Kuder-Richardson reliability measure for binary items; it returns closely similar estimates to Cronbach alpha.

[c] Upper=no. of domains that score above median, high=no. of domains that score at or above the 80th percentile, whichever yields nearer approximation to top 20% of distribution.

[d] HR/HP is the 'high performance' subset obtained by omitting family-friendly and equal opportunities domains.

[e] These are unweighted sample statistics.

Note: items relating to security/long-term employment were included as separate ('loose') items rather than a domain measure.

Table 3. OC and IJS regressed on 3-level variable for each HRM domain: survey regression estimates (t-statistics below)

dependent variable >>	OC		IJS	
HRM variable	v.'low'	v. 'moderate'	v. 'low'	v.'moderate'
development 'high'	**0.380**	**0.438**	**0.334**	**0.345**
	(2.06)*	**(2.32)***	**(1.45)**	**(1.39)**
participation 'high'	**0.156**	**0.343**	**0.377**	**0.349**
	(0.89)	**(2.10)***	**(1.54)**	**(1.91)+**
teams 'high'	**0.178**	**-0.370**	**-0.420**	**-0.081**
	(1.25)	**(2.24)***	**(1.96)***	**(0.40)**
incentives 'high'	**0.182**	**0.411**	**0.377**	**0.450**
	(1.14)	**(2.08)***	**(2.10)***	**(1.97)***
selection 'high'	0.171	0.176	-0.027	0.119
	(0.96)	(1.02)	(0.14)	(0.56)*
family-friendly 'high'	0.161	0.142	-0.156	-0.016
	(1.05)	(0.78)	(0.77)	(0.08)
equal opportunities 'high'	-0.077	-0.058	-0.144	0.064
	(0.46)	(0.32)	(0.69)	(0.28)

Note: The columns show results from separate analyses varying the reference value for the HRM-domain variables.

+ significant at the 10 per cent level * significant at the 5 per cent level or above. All analyses are based on a robust variance estimator and include the set of control variables described in section 3.4.

Table 4. OC and IJS regressed on indices of 'high' domains: estimates (t-statistics below) from linear and flexible specifications

|	HRM		HR/HP	
dependent variable >>	OC	IJS	OC	IJS
(a) Linear (HRM , HR/HP interval scale)	0.116	0.102	0.154	0.173
	2.30*	1.89+	2.34*	2.25*
(b)Flexible (HRM, HR/HP dummies)				
1 domain at 'high' level	0.161	0.314	0.052	0.101
	(0.94)	(1.52)	(0.17)	(0.52)
2 domains	0.397	0.374	0.282	0.408
	(1.99)*	(1.30)	(1.54)	(1.61)
3 domains	0.178	0.126	0.535	0.399
	(0.70)	(0.44)	(2.11)*	(1.35)
4 domains	0.363	0.420	0.527	0.736
	(1.13)	(1.34)	(1.50)	(2.32)*
5 domains	0.733	0.618	1.218	1.130
	(2.60)*	(1.98)*	(3.31)*	(2.45)*
6 domains	0.838	1.025		
	(2.92)*	(2.83)*		
7 domains at 'high' level	1.285	1.250		
	(3.02)*	(2.41)*		

See notes to Table 3 for significance notation and controls.

Table 5. Estimates from regressions of OC and IJS on summed-practice variables. Cell entries are the estimated coefficients with robust standard errors in brackets

	OC		IJS	
model >>	(1)	(2)	(1)	(2)
Total HRM – linear	0.010 (0.009)	-0.039 (0.032)	0.0063 (0.0113)	-0.0753 (0.0357) *
Total HRM – squared	-	0.0012 (0.0008)+	-	0.0019 (0.0007) **
Total HR/HP – linear	0.01456 (0.01125)	-0.014 (0.0398)**	0.012 (0.014)	-0.1576 (0.0451) **
Total HR-HP- squared	-	0.00364 (0.00106) **	-	0.0052 (0.0012) **

See notes to Table 3 for significance notation and controls.

Figure 1. Mean Marginal Predictions of OC by number of HR/HP practices
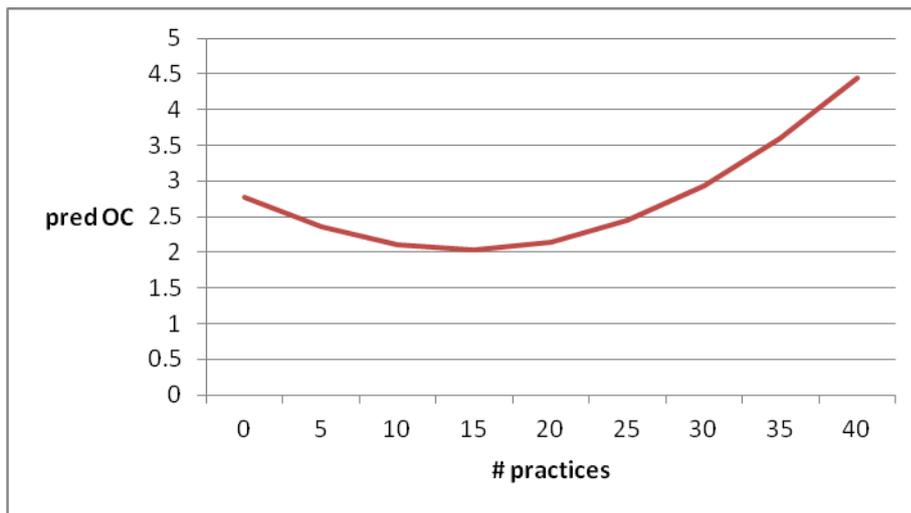
Figure 2. Mean marginal predictions of IJS by number of HRM or HR/HP practices
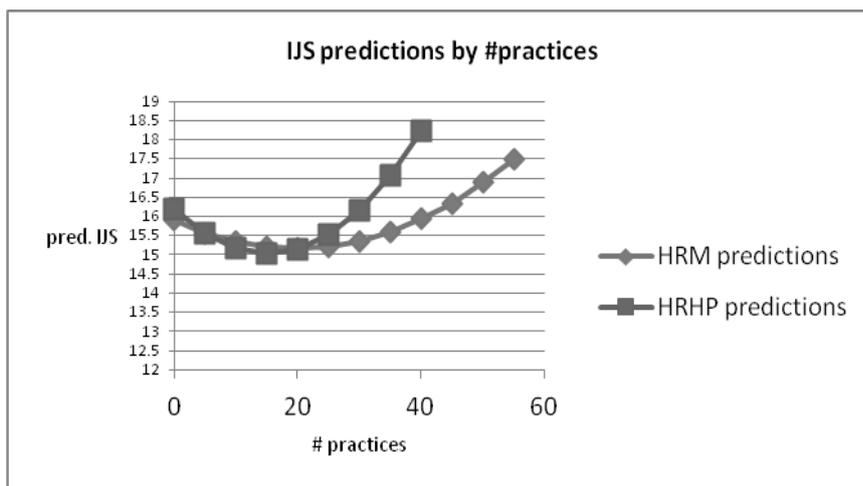
Appendix Table. HRM items and domains

Note: Further details available on request. LOG=largest occupational group.

DEVELOPMENT

Meaning of item	groups
Investor in People standard	all
employee development part of strategic planning	all
induction courses	LOG
proportion getting off-job training is above median for occupational group	LOG
proportion getting cross-job training is above median for occupational group	LOG
range of types of training given is above median for occupational group	LOG
training for team working	LOG
training discussed in briefing groups	all
appraisal for all non-managers	non-managers
appraisal across all occupational groups	all

PARTICIPATION

Meaning of item	groups
discussion time in meetings with management above median	all
discussion time in line briefings above median	all
work organization discussed in briefings	all
production discussed in briefings	all
employment discussed in briefings	all
finance discussed in briefings	all
planning discussed in briefings	all
pay discussed in briefings	all
consultative committee	all
any business changes that involve employees	all
attitude survey	all

TEAMS

Meaning of item	groups
proportion in teams is above median for occupational group	LOG
team members are inter-dependent	LOG
tasks rotate in team	LOG
teams decide how to do the work	LOG
teams have specific area of responsibility	LOG
teams choose own leader	LOG
quality circles or problem-solving groups	all

INCENTIVES

Meaning of item	groups
individual incentive	all
team incentive	all
workplace incentive	all
organizational incentive	all
incentives increase pay differentials	LOG
appraisal increases pay differentials	LOG
merit pay or payment by results used	all
profit-related pay for non-managerial employees	non-managers

(continued)

RECRUITMENT

Meaning of item	groups
selection based on skill	all
selection based on qualifications	all
selection based on experience	all
selection based on motivation	all
selection based on references	all
personality tests in selection	all
competence or performance tests	all

FAMILY-FRIENDLY

Meaning of item	groups
working from home permitted	all
job sharing	all
flexible hours	all
term-time contract	all
workplace creche	all
financial aid for childcare	all
paid paternity leave	all
leave available for elder care	all
part-time option for all employees	all
longer hours option	all

EQUAL OPPORTUNITIES AND DIVERSITY

Meaning of item	groups
equal opportunities training	LOG
equal opportunities discussed in meetings	all
eq.op. recruitment monitored	all
eq.op. recruitment reviewed	all
eq.op. promotion monitored	all
eq.op. promotion reviewed	all
eq.op. pay monitored	all
formal eq.op. policy is checked	all
try to recruit women returners	all
try to recruit ethnic minorities	all
try to recruit older workers	all
try to recruit people with disabilities	all
try to recruit from unemployment	all

Additional items not included in HRM domains ('loose' items)

Meaning of item	groups
types of employee involvement in change[a]	all
job security / no compulsory redundancy	all
vacancies internally filled	all
pay for long service	LOG
occupational pension	LOG
'other' incentive	all
selection based on fitting into team[b]	all
selection based on commitment[b]	all

[a] Four dummies: employees were informed, were consulted, negotiated, decided (reference no involvement).
[b] Additional backcoded response to source item.

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