HRM and small-firm employee motivation – before and after the Great Recession

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Abstract

A long-running debate in the small firms' literature questions the value of formal 'human resource management' (HRM) practices which have been linked to high performance in larger firms. We contribute to this literature by exploiting linked employer-employee surveys for 2004 and 2011. Using employees' intrinsic job satisfaction and organizational commitment as motivational outcomes we find the returns to small firm investments in HRM are U-shaped. Small firms benefit from intrinsically motivating work situations in the absence of HRM practices, find this advantage disturbed when formal HRM practices are initially introduced, but can restore positive motivation when they invest intensively in HRM practices in a way that characterizes 'high performance work systems' (HWPS). Although the HPWS effect on employee motivation is modified somewhat by the Great Recession, it remains rather robust and continues to have positive promise for small firms.

Key words: small firms; human resource management; High Performance Work System; workplace motivation; intrinsic job satisfaction; organizational commitment

JEL Codes: L23; M50; M54

Social Research as the originators of the 2004 and 2011 Workplace Employee Relations Survey data, and the Data Archive at the University of Essex as the distributor of the data.

For over two decades there has been interest within the human resource management (HRM) practitioner and research community in systems of practice that form a cohesive and integrated set designed to maximize business effectiveness and employee wellbeing. These are commonly termed 'high performance work systems' (HPWS), or 'strategic human resource management' (SHRM) whereby the HRM systems are tuned to harmonize with business strategic objectives. This system or strategic perspective distinguishes between HRM practices adopted by a firm in a piecemeal way, and more extensive initiatives that cross several domains of people management.

There is emerging evidence that HPWS yield worthwhile performance gains for firms. However, most of this evidence applies to large firms. Indeed, the value of HRM/HPWS for small firms remains contentious. Some small business experts suggest that HRM development is likely to interfere with distinctive small-firm advantages such as flexibility and informality, which small businesses should use to the full. On the other hand, it is argued that human resources repay intensive development in small firms, as these are often constrained in respect of other resources, notably financial.

Our focus is on the role of HRM/HPWS in the small firm sector, which constitutes a large and growing part of the economy in the United States (Acs, 1999) and in Britain (Hijzen et al, 2010), the country we consider here. We define 'small' firms as those with fewer than 50 employees, while excluding micro-businesses (1-4 employees). However, we also show that our findings hold when extended to firms with up to 100 employees. The study focuses on employee attitudes that represent motivation, using measures that have been shown in previous research to be strongly linked with individual performance.

Ours is the first British quantitative study to investigate the relationship between HRM/HPWS and employee motivation in small firms. It makes several contributions to the debate sketched above. It shows that small firms with no or minimal investment in formal HRM tend to have highly motivated employees, but that with the adoption of HRM, employee motivation declines somewhat. So far, the story accords with the critics' warnings. However, in those small firms that proceed to a more intensive and integrated HRM/HPWS, a threshold is reached from which employee motivation climbs again. In short, the HRM-to -motivation relationship in small firms depends on the variety and complementarity of practices adopted. There are positive messages as well as warnings to be drawn for small-firm practice.

A feature of our research is its coverage of two contrasting economic periods, 2004 and 2011. In 2004, economic conditions were stable and prosperous. In 2011, the British economy was struggling in the wake of a severe recession. The coverage of these two periods makes two additional contributions: first, by testing the constructive validity (Treadway et al., 2005) of HRM/HPWS effects; second, by showing, somewhat counter-intuitively, that HRM/HPWS can have positive effects in the adverse context of a recession. We find that although the HRM/HPWS effect on employee motivation is modified somewhat by the Great Recession, it remains rather robust and continues to have positive promise for small firms.

MOTIVATION AND ATTITUDES

We view small firms' employees in a motivational perspective, through a study of their attitudes. There is a lack of consensus about the meaning of 'motivation', and about the relationship between motivation and attitudes. It is therefore necessary to start by outlining our notion, which comes from the mainstream of attitude theory and work motivation theory. We assume first that

attitudes are essentially motivational. Fishbein (1967: 389) quotes with approval Thurstone's definition of an attitude ('the amount of affect for or against an object'), and equates it with a 'mediating evaluative response' that tends toward overt behavior. Locke (1996: 121) continues to make values the basis of affective attitudes: "Emotions are the form in which one experiences automatized value judgements... according to the standard of one's values.... Events and situations seen as furthering one's values produce positive emotions (happiness, satisfaction, love)". In their review of contemporary work motivation theory, Latham and Pinder (2005) explain how attitudes express the pursuit of desired goals and values, and how the realization of goals and values sustains motivated behaviour.

If this conceptual model is valid, one should observe links between attitudes and work behaviour. This link is supplied by Harrison et al. (2006) with their meta-analysis showing that 'overall job attitude' explains about 25 per cent of the variation (i.e., r=0.50) in workers' 'engagement' behaviours (task performance, organizational citizenship, attendance, timeliness and reduced propensity to quit).

The components of overall job attitude are job satisfaction and organizational commitment. A definition of job satisfaction that fits the general framework sketched above comes from Locke and Latham (1990: 243): 'The degree of satisfaction or dissatisfaction will be a joint function of the degree of fulfilment of the value and the importance of the value to the individual'. Organizational commitment then enters the frame, according to these authors, as a consequence of and complement to job satisfaction: 'Only if satisfaction leads to commitment to the organization and its goals ... will subsequent high performance result' (Locke and Pinder, 1990: 245). Kalleberg and Berg (1987) define affective organizational commitment in terms of

employees' identification with the goals and values of the organization, and their willingness to exert effort in its behalf.

To represent employee motivation in the present research, we followed this approach in using measures of job satisfaction and organizational commitment, but adapted the former to focus on 'intrinsic' or autonomous satisfaction, reflecting the valued experience of autonomous working (Gagné and Deci, 2005). The reason for this focus will become apparent in the following section.

SMALL FIRMS AND THEIR EMPLOYEES

We define small firms as those with fewer than 50 employees. This is consistent with official definitions in both the UK and the EU, but some previous studies have used different definitions: for instance, Way (2002) studied US firms with 20-100 employees. However, we do not think this crucial, since our variant analyses show results are similar if we expand our sample up to firms with 99 employees.

Evidence suggests employees in small firms have particularly positive work attitudes. For instance, studies for the USA using the Quality of Employment Surveys of 1973 and 1977 reported higher satisfaction in small firms (for a review see Tansel and Gazioglu, 2013 who cite 20 studies). In Britain, one can draw on studies using the Workplace Employment Relations (WERS) series, with their linked workplace and employee data in 1998, 2004 and 2011. Tansel and Gazioglu (2013) have re-analysed the 1998 survey and report numerous respects, including job satisfaction and perceptions of employee-management relations, in which smallness is associated with more positive attitudes. Forth et al. (2006: 41, 70), analysing the 2004 dataset,

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report that small firms' employees have the highest levels of self-rated wellbeing and - according to management respondents - relatively low incidence of employee grievances or disciplinary hearings. The present study is the first to use the WERS 2011 data to analyse influences on employee attitudes in small firms, but Lai et al. (2016) consider employee attitudes as explanatory variables for performance, and in passing (see their Table 6) report that on all the attitudinal items considered, small firms score somewhat higher than medium sized firms.

These are remarkable findings, bearing in mind that small firms offer relatively low pay and fringe benefits, little training, and sometimes coercive forms of supervision and management (for Britain, see e.g. Rainnie 1989; for the USA, see the extensive literature on segmented labour markets, e.g. Edwards, 1979). Some insight into what seems a paradox is provided by the study of Kalleberg and van Buren (1996). Using linked employer and employee data for the USA, they showed that larger size was significantly associated with greater material rewards but also lower feelings of job *autonomy* even with controls for many variables that might be linked to size. Autonomy was measured as a composite of working independently, having a say over job changes, taking part in decisions, and *not* being closely supervised. Interpreting this in a work motivation framework, we suggest that small firms offer greater scope for autonomous or intrinsic motivation (see especially the 'self-determination' theory of Gagné and Deci, 2005) to compensate for the relatively weak provision of extrinsic rewards. This also reinforces the warnings of those who have pointed to dangers in introducing HRM into small firms (see, e.g., Cardon and Stevens, 2004; Marlow, 2006).

Further insight into how small firms provide intrinsic rewards is provided by British case study research. For instance, in his intensive study of three clothing manufacturers Ram (1994) depicted an ethos of extensive freedoms and responsibilities for employees, all the more convincing because Ram's focus was chiefly on how small businesses survived in intensely competitive markets, rather than on employees' job quality as such. Established employees had an important role in determining their own working methods, even in one case where the supervisor judged them to be inefficient; they socialized freely with their colleagues; and they had great discretion over their working times to fit work to the needs of their families. Their responsibilities included finding new recruits when these were needed, and for training and embedding them into the work process; and, as also noted by de Kok examining small firms in the Netherlands (2003), they exerted subtle but considerable influence over the decision making of their managers and principals. Case studies in restaurant businesses (Ram et al, 2001) provide a similar picture. Moule (1998), studying a small manufacturing firm, shows in detail how a work group maintains its autonomy in the face of somewhat autocratic principals.

A factor that tends to maintain a positive quality of work in some small firms is the closeness of the proprietors to employees. This aspect is strongly underlined in the group of Netherlands case studies analysed by de Kok (2003): he observes that the employer-owner often works alongside employees, seeks personal satisfaction in the work (as a distinct objective alongside profit), places a high value on 'team spirit', and is in frequent one-to-one communication with employees, which offers scope for them to be influential.

In recent years, British small business has developed strongly in industries requiring high levels of technical and professional expertise, such as health services, ICT, creative media, finance and specialized consultancy. Case research by Tsai et al. (2007) and Gilman and Edwards (2008) addresses this area. The professional staff typically work in a highly autonomous manner, with proprietors reliant on selecting people with appropriate skills. Tsai et al. (2007) report high levels of employee satisfaction with management, in part because of the opportunities employees have to learn from seniors working alongside them. A repeated motif in these studies is the extreme flexibility of workloads and hours, with minimal planning and a 'fluid' type of team working that is described as 'a natural extension of the way work is performed' (Gilman and Edwards 2008: 547).

Within the small-firm literature, a concept frequently deployed to describe employer-employee relationships is 'informality'. This is certainly applicable to the examples of autonomous working and freedom from controls cited above, but can also be applied to aspects of small firm relationships that are more negative, such as proprietors' unconcern about workplace regulations, arbitrary treatment of employees, and favouritism. At an extreme, the 'informal' small firm can end by moving into the grey economy and the casualization of its workforce (Ram et al., 2001). None the less, there is evidence that informality is valued within small firms by both owners and employees, and movement toward a more systematized or 'modern' approach, including by HRM adoption, is often resisted. In the Electron Co. case of Gilman and Edwards (2008), supervisors and team leaders were being introduced but the company was stressing that the roles would be chiefly of a mentoring rather than monitoring type. In Ram et al.'s (2001) PatCo study a specialist food manufacturer was being pushed toward formal controls, with reduced employee discretion, as a consequence of selling to supermarkets, but management was representing the

development to employees as 'organized autonomy' (Ram et al. 2001: 855). Small-firm case research can be cross-checked with large-sample analysis. Storey et al. (2010) developed a survey questionnaire instrument to measure formalization and showed higher formality to be associated with lower ratings of job quality.

Our overall conclusion from this review of evidence is that small firm employment is high in terms of intrinsic rewards, in the form of job autonomy and freedom from external controls. The strength of autonomous or intrinsic motivation (see Gagné and Deci, 2005) suffices to explain the highly positive attitudes that have been reported. Much of the evidence however comes from small firms that have retained an informal approach and it remains to consider how the introduction of HRM affects the picture.

HRM/HPWS EFFECTS ON SMALL FIRMS' EMPLOYEES

In this section, we first consider, in a general way, how HRM systems can have performance-enhancing motivational effects on employees. We then go on to discuss whether similar results can be achieved in the small-firm sector. We will focus particularly on 'high-performance work systems' (HPWS).

Many of the leading studies in this field have used intuitive motivational concepts for interpretation and prescription. For instance, Macduffie (1995) states that an essential condition for performance enhancement is that employees possessing knowledge and skills 'are motivated to apply them in discretionary effort'. Economists interested in the economic effects of complementary work practices stress their value in generating 'incentives to productivity' (Ichniowski et al., 1997). Becker and Huselid (1998) argued that the aim of HPWS is to

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construct a 'skilled and motivated workforce providing the speed and flexibility required by new market imperatives'. Appelbaum et al. (2000:46) stated that 'Jobs that are challenging and make use of workers' skills are intrinsically rewarding'. Batt (2002) theorized that HPWS produce a positive effect via increased employee satisfaction that lowers the firm's quit rate and thus helps to build up human capital and organizational learning.

Previous research (notably the seminal HPWS study of Appelbaum et al., 2000) suggests participation and team organization (team-working) are central domains of HPWS. 'Participation' refers to methods by which employees can make contributions that directly relate to work tasks, work organization and the management of change. Team roles supported by skill development enable employees to widen skills, experience more challenge in their work, and experience increased relatedness with colleagues. Several more traditional aspects of HRM/personnel management have been adapted to fit into an HPWS specification (see Appelbaum et al. 2000). Financial incentives can be extended with group/workplace bonuses or profit-shares. Training and development can help employees take on variable job roles within teams and achieve enhanced levels of skill and self-efficacy. Recruitment and selection are complementary to training and help build a workforce committed to high performance goals (Locke 1996).

Becker and Huselid (2006), elaborating earlier contributions, argued that for HRM to have a major positive impact it is necessary that relevant work practices are 'bundled' in a mutually supportive way. This points to a threshold effect, with motivation and performance rising more steeply once the threshold has been crossed. Why this may be so is theorized more fully by Bowen and Ostroff (2004). These authors maintain that 'HRM practices can be viewed as a

symbolic or signalling function' (Bowen and Ostroff, 2004: 206). If HRM is to alter employee behaviour and performance, it must be a 'strong system' communicating persuasive messages: implementing *a wide range of practices* is valuable in strengthening the HRM message and making it salient. This thesis connects with the idea that HPWS can project organizational values, such as developing employees' capabilities and valuing their views, with which individuals can identify. Such a message is more likely to be trusted when the organization demonstrates its seriousness by implementing a wide range of complementary practices. Inconsistency or half-hearted 'dabbling' in HRM, on the other hand, can be interpreted as insincerity. While Bowen and Ostroff refer generally to HRM, and do not specify a particular configuration of practices as ideal, a fully developed HPWS appears to meet their criteria for a 'strong system'.

Our assumption is that the motivations of small firm employees tend to be highly positive before any HRM development has started.   As HRM practices enter the scene, they may infringe upon established employee freedoms and autonomous working.   Since this freedom and autonomy is the main reason for initially positive attitudes, the effect of HRM adoption is to drive motivation downward. However, as a firm moves close to constructing a full HPWS, it signals a new participative, collaborative and self-developing ethos with which employees can identify. To the extent that this is successful, attitudes (satisfaction and commitment) will move in a positive direction once again.

With the foregoing discussion in mind we propose the following hypotheses:

H1.   Intensive adoption of HPWS (a 'strong system') results in increased intrinsic work motivation, and this is expressed in two testable forms that we base on the work of Harrison et al. (2006) and the more general theory of Locke and Latham (1990):

H1a. There is a positive relationship between the intensity of HPWS practices and the intrinsic job satisfaction (IJS) of employees.

H1b. There is a positive relationship between the intensity of HPWS practices and the organizational commitment (OC) of employees.

The positive relationships indicated in H1a and H1b only apply above some threshold of HPWS implementation that is to be identified empirically.

H2. At below-threshold levels of adoption of HPWS, there will tend to be reduced levels of intrinsic work motivation. This will have identifiable consequences H2a and H2b, relating to *reduction* in IJS and in OC, respectively, from the high 'baseline' state of motivation that we regard as characteristic of small firms.

The overall prediction, therefore, is a non-linear ('U-shaped') relationship between overall job attitudes and HPWS intensity. Such a relationship is represented by a model with both linear and quadratic (squared) terms, the linear term having a negative sign and the quadratic term having a positive sign.

Since our study covers two distinct economic periods or situations, the question arises whether the above hypotheses apply without modification to both. Some previous studies suggest that in firms where employee relations are adversely affected by business conditions the positive impacts of HRM/HPWS are cancelled.   For example, Zatzick and Iverson (2006) showed that

during recessionary conditions in Canada, the positive link between HRM and performance was lost in firms laying off workers, while those firms that avoided layoffs were able to maintain this positive linkage. A British case-study (Hailey et al. 2005) documents the damage to employee relations arising when a firm overlays a highly participative and empowering HRM system with coercive managerial behaviors responding to business pressures. On the other hand, Cappelli (1999) observed that employees in the USA in the 1990s tended to be forgiving toward managements that imposed layoffs because this was seen as forced by external circumstances affecting most firms. In the UK recession of 2008-12, most firms were driven to make cost-reducing changes and so managements may have been insulated from blame by similar employee responses as those observed by Cappelli (1999). In that case, the effect of HRM/HPWS on employee attitudes/motivation would likely not be modified by the recession. Outcomes might partly depend on how 'baseline' or pre-HRM attitudes in small firms react to recessionary pressures, but we have found no previous study directly addressing this issue. In the absence of a compelling argument to the contrary, we leave our hypotheses unaltered for the recessionary period.

DATA, MEASURES AND ANALYSIS METHODS

Data

We use the Workplace Employment Relations Surveys for 2004 and 2011 (henceforth, WERS2004 and WERS2011).[1] We make use of employee within-firm samples to derive

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[1] For details on the surveys see van Wanrooy et al. (2013).

attitudinal outcome measures,[2] while management interviews (conducted prior to data collection from employees) provide the HRM/HPWS variables and other control variables. This combination reduces the risk of common method artefact (Podsakoff et al. 2003) and respects time sequencing of the independent and dependent variables (Wright et al. 2005). In keeping with most of the literature on the effects of HRM or HPWS we confine our analyses to the private sector subsamples.

A sharp fall in response between 2004 and 2011 (typical of British social surveys during this period) poses a threat to comparability when we assess over-time consistency of findings.[3] We develop a new way of mitigating this problem explained in the analysis section below.

From the management information, we identify those workplaces that represent small firms (less than 50 employees in the overall organization). Each firm is represented by only one workplace, but this is not problematic, since in the case of small firms, approximately 80 per cent are single-establishment.[4] There are 280 private sector small firms in the 2004 survey and 375 in 2011. The analysis focuses on these small firms.

Dependent variables

The chief analyses refer to overall job attitude (Harrison et al. 2006) through two variables that we label intrinsic job satisfaction (IJS) and organizational commitment (OC). We obtain the

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[2] At workplaces with up to 25 employees, all were sent a self-completion questionnaire; in those with more than 25 employees, a sample of 25 was drawn.

[3] Response to the management interview survey fell from 64 per cent in 2004 to 46 per cent in 2011.

[4] We have also made analyses on the sub-sample of single-establishment small firms. Results are qualitatively similar to those reported for the full small firm sample below.

measures from employee responses that are averaged at the level of the workplace that represents the firm. This aggregation and averaging results in smooth quasi-continuous measures. Unobserved individual attributes that may bias attitudinal responses (notably personality – see Diener and Lucas, 1999) will tend to be averaged out at the mean workplace level (there could however still be unobserved selection effects imposed by consistent selection processes). From the viewpoint of firm management, the aim is to have positive motivation across all employees, and the workplace-average measures reflect this managerial perspective.

[INSERT TABLE 1]

In both years the WERS employee questionnaire contained eight facet satisfaction items and from these four were selected for their similarity to the 'job itself intrinsic satisfaction' subscale of Warr et al. (1979). Table 1 provides item details. The Cronbach alpha of the IJS items in the full employee survey sample was 0.87 in both 2004 and 2011. Responses are summed at the level of the individual respondent and the summed IJS scores are averaged over the employee respondents at each workplace.

The WERS measure of OC consists of three items (see Table 1 again) which have counterparts in the six-item Lincoln-Kalleberg measure of affective organizational commitment. OC has a Cronbach alpha of 0.85 in the full employee surveys of both years. To compute the measure, the three items were summed at the individual level and then averaged across the employees at each workplace.

The aggregation and averaging of these items requires an assumption that the items themselves constitute cardinal (interval) measures. Applied psychologists have been (implicitly) adopting the cardinality assumption since the introduction of Likert scales in the 1930s, accompanied by the method of 'summative ratings' (Murphy and Likert, 1937). More recently, economists have also tended to accept the cardinality assumption for the analysis of multi-point attitude scales. Recent examples include Powdthavee (2011) and Taylor et al. (2011). Econometric methodological investigations that emphasize the advantages of the cardinal, or linear, assumption include Ferrer-i-Carbonell and Frijters (2004) and Riedl and Geishecker (2014).

To check the selection of items for our constructs, a principal components analysis was performed using the full employee sample on the eight satisfaction items, the three OC items and eight further items relating to individual well-being. After varimax rotation, the IJS and OC constructs emerged as distinct components with high loadings on all their items. These results (not shown here) are available on request. Another distinct component was formed of the three items relating to satisfaction with pay received, training received, and job security: we label this 'extrinsic job satisfaction' (EJS). We ran variant models with EJS as the dependent variable in place of IJS, as a test of the discriminant validity of the IJS construct.

Measures of HPWS practice

Information about HRM practices comes from the WERS interview with the senior manager responsible for HRM or personnel management at the workplace. We consider only items that are descriptive of current practice and ignore any items that seek the manager's opinion about climate, management-employee relationships etc. British studies that similarly emphasize descriptive measures of HRM practice include Brown et al. (2008), Forth and Millward (2004),

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and Ramsay et al. (2000); for North America, see e.g. Cappelli and Neumark (2001); Godard (2001); Osterman (2006); Wright et al. (2005); Zatzick and Iverson (2006).

In the HRM-performance literature all the HPWS items from a cross-sectional survey are usually aggregated into a single overall index of practices (e.g., Becker and Huselid (1998:63)).[5] It has often been remarked, however, that this approach has not led to consistent, replicable measures of HRM practice, because of differences across studies in the available items. We find in the present study that although many descriptive items are available, they sometimes do not remain the same across the 2004 and 2011 surveys, and there is also marked variation in the statistical reliability of domain measures over time. We therefore introduce a new measurement approach, as follows. (1) Five domains that correspond with the HPWS concept of Appelbaum et al. are defined; these are participation, teams, development, recruitment, and incentives. Across these domains, we find 43 suitable item measures in 2004 and 44 in 2011. (2) We group items by domains, and the grouping is checked by reliability analysis. (3) In each firm, we count how many practices are reported to be present in each domain. If *three or more* items are present,[6] we classify the firm as achieving 'high' on that practice domain. (4) In each firm, we count how many domains are classified as 'high', and this number is taken as the *HPWS-intensity score* for that firm. This yields a six-point scale with values from 0 to 5. Among small

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[5] This approach is also common in the literature using the Workplace Employment Relations Survey. Recently, for example, Wu et al. (2015) use the 2011 survey to construct a single index based on 17 factor-weighted dichotomous, categorical and count items. The practices they focus on are a subset of those used in our analyses. The advantage of using a broader set of practices is that it makes separate domain counts feasible and hence is also valuable for the new measure of intensity we have derived which relies on having a minimum number of practices within each domain.

[6] We also investigated on each side of this criterion, setting the 'high' domain criterion as having two or more practices implemented, or alternatively four or more practices. We discuss these sensitivity tests in the Results section.

firms, this scale has correlation 0.91 with the additive index of HPWS items in 2004, and 0.83 in 2011. The HPWS-intensity measure has a high degree of face validity with respect to the Bowen-Ostroff concept of a 'strong system' HRM. Its criterion validity (with respect to employee attitudes) is demonstrated in the Results section below. Further, there are a great many ways in which a firm can reach the 'high' threshold in any given domain, and there are numerous ways in which firms can select from the five domains which ones they wish to develop: thus the HPWS-intensity score provides for uniqueness and equifinality in firm HRM/HPWS strategy (Becker and Huselid, 2006) at both item and domain level. We believe that this method provides robust comparability across surveys: it is not necessary that the item pool be identical across time.

Our use of the label 'intensity score' is consistent with practice in economics, where (for example) the term 'intensive margin' refers to the number of hours worked by employees. While many items are of the simple 'present/absent' type, others are derived by reducing a quantified banded variable (such as proportion of employees taking part in the practice, or time devoted to the practice) to dichotomous form by splitting at the median.[7] Note also that while some items refer to fairly basic HRM practices, others can be regarded as toward the sophisticated or 'deep' (Cox et al., 2006) extreme: for instance, teams that select their own leader, or communication meetings that discuss staffing levels or company finances (see Annex Table 1). Overall, the item pools for both surveys provide a reasonable basis for assessing how

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[7] Dichotomizing at the median is an efficient method of removing measurement error from a regressor variable (Wald 1940).

far firms have progressed toward HPWS[8]; although there is doubtless scope for further refinement in scaling, we have held back from pursuing that because of the bias that would likely be introduced by having estimated variables among the regressors.

Table 2 gives further details of the derived domain-high and HPWS-intensity scores. There was a substantial increase in high-scoring domains between 2004 and 2011, notably in regard to participative practices and to incentives.

[INSERT TABLE 2]

Control variables

'Structural' control variables, obtained from the management interview, are included in all the reported analyses. Industry is represented by 11 dummies; and there are controls indicating 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; the percentage (banded) of employees in non-permanent jobs; and a dummy for presence of recognised union(s). We could not include a variable sub-dividing size within the 'small' (5-49 employees) segment, as this information was not available in 2004. However, we count the number of managers at the workplace and create a dummy for those that had three or more managers – an indication of organizational complexity. We additionally included an

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[8] That said, there are notable increases in the incidence of participation and incentives between 2004 and 2011. These might partly reflect changes in the way data were collected between 2004 and 2011, or might reflect wider managerial familiarity with HRM concepts. It is not necessary for our measures to be identical in the two years. What is important is that we count practices in such a way as to be able to distinguish between workplaces according to their high and low intensity use of HRM *within* those two years.

item relating to job security guarantees made by management – an HRM variable considered important by Forth and Millward (2004), but not combining with any of our HPWS domains.

Characteristics special to small firms as additional control variables

In all analyses, we include controls for further characteristics regarded as significant in the small firm literature. The number of years that the business has been located at its present workplace, or at previous workplaces from which it has moved, is used as a measure of 'newness' (see Cardon and Stevens, 2004). This is divided into five bands approximating quintiles of the firm-age distribution. To represent family control over the firm, a frequently noted characteristic of small firms, we constructed a dummy based on whether there is a family that holds more than half the shareholding. We also included the Storey et al. (2010) measure of 'formality' that can be regarded as particularly relevant to small firms. Full details of this measure are given in Storey et al. (2010:311); it has a Cronbach alpha of 0.77 in these surveys.

Firms' recessionary policies in 2011

In analysing the 2011 data we incorporate a dummy variable identifying workplaces having more than one type of employment policy in response to the recession – commonly a wage freeze coupled with some restriction of hours or change of hours contract (e.g., zero hours contracts). One third of small firms had two or more employment policies responding to the recession.[9]

[INSERT TABLE 3]

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[9] We investigated several other ways of representing recessionary employment policies (e.g., separate dummies for wage policies and hours policies) but the two-plus criterion yielded the clearest results.

Table 3 presents correlations between the independent variables in 2004 (panel (a)) and 2011 (panel (b)) for numeric (continuous and multi-categorical) variables followed by the tetrachoric correlations for dummy variables, excluding industry dummies.

Analysis method

The analysis used the survey regression method with a robust variance estimator (also known as robust regression: see Berk 1990). The measures of IJS and OC were treated as continuous variables, since they are smoothly distributed workplace means. These means are themselves sample-based estimates. They are therefore measured with error, and heteroskedastic because the workplace samples vary in size. However, as these 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 complex survey design including weighting.

The HPWS-intensity variable was represented in two different ways in variant specifications. In the first variant, it was represented as a linear effect; in the second, it was represented with both linear and quadratic (squared) terms. The latter specification makes it possible to assess the existence of nonlinearities (U-shaped relationship) as specified in the hypotheses.

The lower response rate in 2011 compared with 2004 suggests possible bias from sample selectivity. Effects on the covariance structure are unpredictable. Both surveys employed stratified sampling by workplace size and industry, and establishment weighting is intended to restore representativeness with respect to these variables. However, this does not guarantee representativeness with respect to the other control variables used in our analyses. We therefore

use an alternative approach derived from the statistical matching methodology used in programme evaluation research (Fröhlich et al., 2015). We take WERS2004 as the 'target' sample, both because of its superior response rate and because of the more typical economic conditions in which it took place, and re-weight WERS2011 to achieve mean covariate balance across *all* control variables that are present in both 2004 and 2011. This is made possible by the entropy balancing programme developed by Hainmueller and Xu (2013). We carry out the 2011 analyses along the same lines as for 2004, but with control variables that, when the sample is re-weighted, have the same mean values (within a small tolerance) as in 2004. For example, before re-weighting the small firms in 2011 report having a mean of 49 per cent of employees in 'lower-skilled' occupations, but after reweighting this falls to 43 per cent. Other variables that were substantially modified by rebalancing were the proportion of family-controlled business, the proportion of non-permanent employees, and the proportion of firms with a trade union. By reducing mean differences in control variables between surveys, we render comparative assessment more plausible. At the same time, however, we respect theoretically relevant differences between surveys by permitting the HPWS measure to vary and by introducing the additional measure of policy response to the recession in the 2011 analysis.

In variant analyses, we ran the 2011 data without the re-balancing procedure and obtained HRM/HPWS effects that were neither significant nor readily interpretable. To the extent that our analyses after carrying out covariate rebalancing yield a convincing story, the method's value is supported.[10]

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[10] This technique is relatively simple to implement. However, whether it is appropriate or not is something analysts need to consider on a case-by-case basis.

RESULTS

HRM/HPWS and overall attitudes in small firms, 2004

Table 4 shows the key results from regression analyses for 2004. In models (1) and (3), referring respectively to IJS and OC, the coefficient of HRM-intensity is negative and significant (albeit only at the 10 per cent level in the case of IJS). This appears to give support to those who have argued that HRM is ill-suited to small firms' employment relationships.

However, results from models (2) and (4), which introduce a non-linear functional form, paint a different picture. While the linear term is negative in both models, the quadratic is positive, and both are statistically significant at the one per cent level. The 'turning point' row indicates the value at which the effect of HRM intensity changes from negative to positive. For both IJS and OC, small firms can expect positive outcomes once they have three HRM domains substantially developed (approximately 40 per cent of the small firms had reached this level of HRM development), with further improvement as they proceed toward a more complete HPWS. These results provide strong evidence in support of both H1 (a and b) and H2 (a and b).

[INSERT TABLE 4]

Table 4 also reports the estimated effects of formality, family control, internal structural complexity (3 or more managers), and age of firm. Somewhat unexpectedly, the level of formality was positively and significantly related to OC and was positive but non-significant in relation to IJS. This is inconsistent with the results reported by Storey et al. (2010), who included no representation of HRM intensity. The other small-firm characteristics had little effect on the IJS and OC outcomes.

Estimates for the other control variables are not shown for reasons of space, but the full results are available on request.

HRM/HPWS and overall attitudes in small firms, 2011

Table 5 shows the results for 2011, with weighting that achieves covariate balance to 2004. This table follows the same general pattern as in Table 4, except that there is an additional variable representing the use of multiple cost-cutting policies by the firm in response to the recession. This additional variable is key to understanding the 2011 results. Employees in the one-third of small firms using multiple cost-cutting methods have, other things being equal, substantially lower levels of IJS and OC. With respect to the HPWS effect, for IJS the non-linear model continues to perform well, with the linear term significant at the 10 per cent level and the quadratic term significant at the 5 per cent level; IJS begins to climb once a firm has achieved, roughly speaking, substantial implementation of more than two HRM domains (about two-thirds of small firms had by 2011 reached this stage of development). In the case of OC, however, the non-linear model fails and a simple linear model is adequate: substantial development of *any* HRM domain is associated with higher OC.

[INSERT TABLE 5]

To clarify what is taking place as a result of firms' employment response to the recession, we also ran models separately for those who had multiple cost-cutting policy responses to the recession and those who had not (i.e., the latter comprise firms with no cost-cutting response or with only one). The estimates are shown in Table 6. When multiple cost-cutting responses are absent (panel (b)), the effect of HPWS intensity is similar to 2004 in the case of IJS, but

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disappears in the case of OC. When however multiple cost-cutting responses are present (panel (a)) a simple linear model with positive coefficient is now supported for both IJS and OC, while the nonlinear model is only maintained in a much weakened form for IJS. Overall then, it seems as if the recessionary pressures transmitted to employees via small firm cost-cutting policies in the recession tended to increase the positivity of HRM/HPWS effects (the opposite result to the Canadian study of Zatzick and Iverson, 2006). A possible interpretation is that recessionary policies erase the baseline motivational advantage of small firms but not the positive impact of HPWS. Note that some caution is needed over the magnitude of point estimates in models based on 111 observations, as there is a risk of over-fitting.

[INSERT TABLE 6]

Additional tests of robustness and validity

We carried out several tests relating to aspects of model robustness and validity; to avoid the additional complication of rebalancing the 2011 data these tests were confined to 2004. Appendix Table 2 shows estimates, comparable to those in Table 4, when the definition of 'small' firm is extended to 5-99 employees. The estimates change very little with this extension, suggesting that the methodology is robust to moderate changes in population definition.

Variant analyses were conducted with the HPWS intensity variable based on domains that met a criterion of two or more practices adopted (instead of three or more). The results were similar to those shown above at Table 4. Confining attention to the linear-quadratic specifications, for IJS the HI effect was -1.16 with t-statistic of -2.86 and the HI-squared effect was 0.168 with t-statistic of 2.64; both test statistics are significant at the 1 per cent level. For OC, the

corresponding effects were -0.664 and 0.094, with t-statistics of -1.95 and 1.74, both significant at the 10 per cent level. These results indicate that our method of specifying the HPWS variable permits a degree of flexibility in the domain criterion, and this contributes to its constructive validity. However, when we shifted the domain criterion in the other direction, to four or more practices, all estimates for the linear and quadratic HPWS terms became non-significant. This may be because relatively few small firms achieved the higher criterion.

We also ran an analysis with extrinsic job satisfaction (EJS) as the dependent variable. Here the results for the linear HPWS term were b=-0.34, t=-1.22, and for the quadratic term b=0.054, t=1.21. (Full results are available on request). This non-significant result indicates the discriminant validity of IJS as against EJS, hence supporting our notion that working in a small firm is intrinsically motivating.

CONCLUSIONS

The aim of this research has been to assess the effects of human resource management (HRM) and the more systematic use of such practices in High Performance Work Systems (HPWS) on the intrinsic job satisfaction (IJS) and organizational commitment (OC) of small firms' employees, both before and after the 2008 recession in Britain. These attitudes represent dimensions of employee motivation that previous research has demonstrated to have substantial implications for individual behaviour and performance.

The analyses for 2004, when the British economy was buoyant, provide strong evidence that the effects of HRM are *non-linear* ('U-shaped'), with negative effects at low levels of HRM implementation, but positive effects once more intensive implementation has been reached.

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These findings are consistent with our depiction of small firms' employees as having somewhat positive attitudes at a baseline where HRM is undeveloped, initially reacting negatively to the introduction of HRM, but then recovering more positive attitudes as a firm moves to a more developed HPWS that fosters participation, team-work and skill development.

Results are somewhat more complex for 2011. Differences then appeared both between the effects on IJS and the effects on OC, and between small firms that had introduced multiple cost-cutting policies to counter the recession, and those that had not. For the overall 2011 sample, the U-shaped relation between HRM/HPWS was maintained for IJS but for OC a simpler linear or additive effect of HRM/HPWS now appeared best. Further analysis showed that the linear model applied for both IJS and OC in the case of the sub-sample of small firms that had introduced multiple cost-cutting policies. When small firms responded to the recession through cost-cutting employment policies, the former negative effect of low-intensity HRM on motivation tended to be suppressed. This was accompanied by strongly negative reactions toward the cost-cutting employment policies themselves. A parsimonious interpretation is that the cost-cutting policies severely constrained the autonomous working and time freedoms normally enjoyed by small firm employees, and against that frame the development of HRM/HPWS practices appeared relatively benign to employees.

The practical implications of these findings are challenging for small enterprise management. There is much in our investigation that accords with criticisms of HRM: attitudes are highly positive when HRM is absent. It seems unrealistic, however, to recommend staying in this 'never-never land'. As the enterprise grows, there is a normal, possibly inevitable, movement toward more complexity, leading management to seek a more systematized approach. Such a

transition is certain to be difficult and the early stages of HRM/HPWS implementation forms part of this difficulty. The key for the small firm is to press on to a more intensive and more integrated form of HPWS that sends stronger signals of positive intent toward employees. Descriptive information for 2011 indicates that this is the direction in which many small firms are moving. The 2011 results also suggest that in turbulent competitive conditions, that may well affect small firms for the foreseeable future, HRM/HPWS will be accepted more readily by their employees. This however requires further confirmation; qualitative research with employees of small firms adopting HRM/HPWS would be of particular value.

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

firms, 2004 and 2011

		2004			2011			
	range	mean	s.d.	N	mean	s.d.	N	Items
IJS scale	4-20	15.84	1.61	280	16.02	1.79	375	(Satisfaction with..) Sense of achievement from your work, Scope for using your own initiative, Amount of influence over your job, The work itself. 5-point item response, high=more satisfied. Alpha = 0.87
OC scale	3-15	11.67	1.54	279	12.10	1.56	375	(Agreement that …) Share many of the values of my organization, Feel loyal to my organization, Proud to tell people who I work for. 5-point item response, high=stronger agreement. Alpha = 0.85

Note: Unweighted estimates. Alphas are based on the full employee sample

Table 2. HRM domains and HPWS intensity measure in small firms, 2004 and 2011

% 'High' on:	*2004*	*2011*
participation	44	81
teams	42	46
development	46	55
recruitment	79	80
incentives	12	40
Mean HPWS intensity (s.e.):	2.23 (0.102)	3.02 (0.089)

Note: 'High' is a dummy variable for each domain, taking value 1 when 3 or more practices are implemented in that domain. All estimates are survey-weighted. For further details of items used in domain construction, see Appendix Table 1.

Table 3: correlations of regressor variables

Panel 3 (a) Year 2004

1. Correlations of numeric regressors

	Hi-hr	% fem	% higher	%inter	formal	age	nonperm
HI-hr	1.0						
% female	0.205	1.0					
% higher	0.159	-0.057	1.0				
% intermediate	0.069	-0.119	-0.079	1.0			
formality	0.647	0.222	0.307	0.185	1.0		
firm age	-0.164	0.005	-0.188	0.070	-0.143	1.0	
% nonpermanent	0.111	0.087	0.042	0.044	0.126	-0.122	1.0

Note: Firm age and % nonpermanent are banded variables; as the bands are based on approximate quintiles, we treat them here as numeric but in models they are treated as categorical.

2. Tetrachoric correlations of dummy variables

	family	union	managers	security
family owned	1.0			
unionized	-0.296	1.0		
3+ managers	0.095	-0.067	1.0	
job security	-0.037	0.224	0.112	1.0

Note: Matrix adjusted to be positive semi-definite. 'Job security' means a promise by the firm not to make compulsory redundancies. Industry dummies are not included.

Panel 3 b) Year 2011

1. Correlations of numeric regressors

	Hi-hr	% fem	% higher	%inter	formal	age	nonperm
HI-hr	1.0						
% female	0.074	1.0					
% higher	0.146	-0.048	1.0				
% intermediate	-0.018	-0.205	-0.089	1.0			
formality	0.648	0.111	0.237	0.023	1.0		
firm age	-0.105	0.032	-0.085	0.101	-0.074	1.0	
% nonpermanent	0.105	0.095	-0.029	-0.011	0.018	0.030	1.0

Note: Firm age and % nonpermanent are banded variables; as the bands are based on approximate quintiles, we treat them here as numeric but in models they are treated as categorical.

2. Tetrachoric correlations of dummy variables

	2+ cuts	family	union	managers	security
2+ cost-cuts	1.0				
family owned	0.040	1.0			
unionized	-1.0	-0.495	1.0		
3+ managers	0.229	0.068	0.083	1.0	
job security	-0.317	-0.147	-1.00	-0.059	1.0

Note: Matrix adjusted to be positive semi-definite. '2+ cost cuts' refers to cuts made in response to the 2008 recession. 'Job security' means a promise by the firm not to make compulsory redundancies. The perfect negative correlations between union and cuts, union and job security probably arise because of small number of unionized firms. Industry dummies are not included.

Table 4.

Robust regression estimates of HR intensity on small firm employees' IJS and OC, 2004.

	Mean IJS		*Mean OC*	
HR intensity:	Model (1)	Model (2)	Model (3)	Model (4)
HI	-0.192 (0.109)	-0.983 (0.334)	-0.199 (0.096)	-0.855 (0.265)
	-1.77 +	*-2.94 ***	*-2.07 **	*-3.23***
HI^2		0.156 (0.056)		0.130 (0.048)
		2.77 **		*2.73***
Turning point		3.15		3.29
Smallness features:				
Formality	0.058 (0.069)	0.090 (0.072)	0.111 (0.057)	0.138 (0.059)
	0.84	*1.26*	*1.95 +*	*2.33 **
Family-owned	-0.245 (0.248)	-0.240 (0.244)	-0.290 (0.213)	-0.288 (0.214)
	-0.99	*-0.98*	*-1.36*	*-1.35*
3+ managers	-0.070 (0.246)	-0.104 (0.242)	-0.345 (0.220)	-0.377 (0.218)
	-0.28	*-0.43*	*-1.57*	*-1.73 +*
Firm age:				
7-12 years	-0.186 (0.339)	-0.022 (0.358)	0.093 (0.289)	0.225 (0.305)
	-0.55	*-0.06*	*0.32*	*0.74*
13-20 years	-0.018 (0.416)	0.103 (0.413)	-0.107 (0.349)	-0.007 (0.344)
	-0.04	*0.25*	*-0.31*	*-0.02*
21-31 years	0.294 (0.433)	0.438 (0.411)	0.353 (0.358)	0.470 (0.336)
	0.68	*1.06*	*0.99*	*1.40*
>31 years	-0.576 (0.404)	-0.417 (0.400)	-0.347 (0.296)	-0.216 (0.303)
	-1.42	*-1.04*	*-1.17*	*-0.71*
R-squared	0.174	0.208	0.286	0.312

Notes: cells present coefficient estimates with standard errors in parentheses and t-statistics in italics below. Significance: + significant at the 10% level * significant at the 5 per cent level ** significant t at the 1 per cent level. HI is the index of high-scoring domains (range 0-5). All above analyses have N=276. Analyses have additional controls for industry, proportion female employees, proportions higher-level and intermediate-level employees, proportion (banded) of non-permanent employees, trade union recognition, and 'no compulsory redundancy' policy.

Table 5

Robust regression estimates of HR intensity on small firm employees' IJS and OC, 2011

HR intensity:	Mean IJS		Mean OC	
	Model (1)	Model (2)	Model (3)	Model (4)
HI	0.157 (0.113)	-0.631 (0.328)	0.187 (0.090)	-0.013 (0.276)
	1.40	*-1.92+*	*2.09**	*-0.05*
HI^2		0.136 (0.056)		0.035 (0.048)
		*2.42**		*0.72*
Turning point		2.32		none
Recession policies:				
Multiple cuts	-0.887 (0.280)	-0.912 (0.278)	-0.560 (0.256)	-0.566 (0.258)
	*-3.17***	*-.3.28***	*-2.18**	*-2.20**
Smallness features:				
Formality	-0.162 (0.064)	-0.153 (0.062)	-0.082 (0.050)	-0.080 (0.050)
	*-2.53**	*-2.49**	*-1.62*	*-1.59*
Family-owned	-0.068 (0.253)	-0.019 (0.247)	-0.044 (0.209)	-0.031 (0.207)
	-0.27	*-0.08*	*-0.21*	*-0.15*
3+ managers	-0.181 (0.251)	-0.258 (0.255)	-0.026 (0.213)	-0.045 (0.211)
	-0.72	*-1.01*	*-0.12*	*-0.21*
Firm age:				
7-12 years	-0.852 (0.518)	-0.863 (0.506)	-0.940 (0.404)	-0.943 (0.403)
	-1.64	*-1.71 +*	*-2.33**	*-.2.34**
13-20 years	-0.667 (0.368)	-0.685 (0.358)	-0.738 (0.278)	-0.742 (0.278)
	-1.81+	*-1.92 +*	*-2.65***	*-2.67***
21-31 years	-0.493 (0.388)	-0.464 (0.372)	-0.676 (0.305)	-0.669 (0.302)
	-1.27	*-1.25*	*-2.22**	*-2.21**
>31 years	-0.831 (0.403)	-0.849 (0.395)	0.925 (0.334)	-0.929 (0.334)
	*-2.06**	*-2.15**	*-2.77***	*-2.78***
R-squared	0.184	0.201	0.174	0.175

Notes: Cells present coefficient estimates with standard errors in parentheses and t-statistics in italics below. Significance: + significant at the 10% level * significant at the 5 per cent level ** significant at the 1 per cent level. HI is the index of high-scoring domains (range 0-5). N for these analyses is 336; the reduction in N, compared with Table 1, is mainly due to missing information concerning industry. For other controls, see Table 4.

Table 6

Effects of HR intensity in small firms with and without multiple recessionary policies, 2011

	(a) Firms with 2+ cost-cutting policies				(b) Firms with only one or no cost-cutting policy			
	Mean IJS		Mean OC		Mean IJS		Mean OC	
HR intensity:	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
HI	0.885	-0.509	0.647	-0.002	-0.071	-0.803	-0.064	-0.010
	(0.219)	(0.608)	(0.189)	(0.529)	(0.126)	(0.345)	(0.083)	(0.291)
	4.03**	*-0.84*	*3.42***	*-0.00*	*-0.56*	*-2.33**	*-0.77*	*-0.04*
HI^2		0.244		0.114		0.129		-0.009
		(0.101)		(0.093)		(0.055)		(0.049)
		2.41*		*1.23*		*2.33**		*-0.19*
Turning point		1.04		none		3.12		none
Smallness features:								
Formality	-0.256	-0.233	-0.208	-0.197	-0.095	-0.093	0.036	0.035
	(0.125)	(0.115)	(0.114)	(0.109)	(0.080)	(0.076)	(0.055)	(0.055)
	-2.04*	*-2.02**	*-1.83+*	*-1.80+*	*-1.22*	*-1.23*	*0.65*	*0.65*
Family-owned	-0.497	-0.279	-0.467	-0.365	-0.002	0.007	0.005	0.004
	(0.474)	(0.448)	(0.482)	(0.483)	(0.270)	(0.263)	(0.203)	(0.203)
	-1.05	*-0.62*	*-0.97*	*-0.76*	*-0.01*	*0.03*	*0.02*	*0.02*
3+ managers	-1.035	-1.460	-0.101	-0.298	-0.027	-0.032	-0.192	-0.92
	(0.490)	(0.488)	(0.490)	(0.508)	(0.251)	(0.250)	(0.199)	(0.199)
	-2.11*	*-2.99***	*-0.21*	*-0.59*	*-0.11*	*-0.13*	*-0.96*	*-0.96*
Firm age:								
7-12 years	-1.800	-1.944	-0.480	-0.547	-0.557	-0.540	-1.018	-1.020
	(0.644)	(0.679)	(0.598)	(0.621)	(0.470)	(0.452)	(0.338)	(336)
	-2.80**	*-2.86***	*-0.80*	*-0.88*	*-1.19*	*-1.19*	*-3.01***	*-3.03***
13-20 years	-1.700	-2.049	-0.855	-1.018	-0.146	-0.084	0.260	-0.264
	(0.638)	(0.689)	(0.530)	(0.572)	(0.403)	(0.385)	(0.269)	(0.272)
	-2.67**	*-2.97***	*-1.61*	*-1.78+*	*-0.36*	*-0.22*	*-0.96*	*-0.97*
21-31 years	-1.297	-1.462	-0.191	0.268	-0.414	-0.339	-0.879	-0.884
	(0.690)	(0.734)	(0.634)	(0.656)	(0.402)	(0.382)	(0.304)	(0.305)
	-1.88+	*-1.99**	*-0.30*	*-0.41*	*-1.03*	*-0.89*	*-2.89***	*-2.89***
>31 years	-1.871	-1.971	-0.988	-1.034	-0.606	-0.624	-0.799	-0.798
	(0.646)	(0.718)	(0.638)	(0.675)	(0.422)	(0.406)	(0.301)	(0.301)
	-2.90**	*-2.74***	*-1.55*	*-1.53*	*-1.44*	*-1.54*	*-2.66***	*-2.65***
R-squared	0.380	0.424	0.350	0.362	0.226	0.241	0.288	0.288

Notes: Cells present beta coefficients with standard errors in parentheses and t-statistics in italics below. Significance: + significant at the 10% level * significant at the 5 per cent level ** significant at least at the 1 per cent level. HI is the index of high-scoring domains (range 0-5). For other controls, see Table 4. N for models 1-4 is 111; for models 5-8, 225.

Appendix Table 1: Items Used in Construction of HRM/HPWS Measures

Domain name	Contents – Year 2004
Participation KR20=0.78	<u>Meeting time; briefing time</u>; subjects discussed in meetings (organization, production, staffing, finance, planning, pay); consultative committee set up; attitude surveys used; changes made with employee involvement.
Team working KR20=0.67	<u>Proportion in teams</u>; task rotation within teams; teams have inter-dependence, responsibility, autonomy; team chooses their leader; quality circles.used.
Development KR20=0.68	'Investor in People' standard achieved; development included in firm strategy; <u>proportion given off-job training</u>; <u>proportion given cross-job training</u>; <u>variety of training courses used</u>; induction courses used; team training; training discussed in briefing groups; appraisal for non-managers.
Selection KR20=0.52	selection criteria: qualifications, skills, references, motivation, experience; use personality tests; use skill tests.
Incentives KR20=0.68	bonus for individual, group/team, workplace, organization performance; profit-sharing for non-managers; merit-based or performance pay; appraisals that affect pay differentials; incentives that affect pay differentials.
	Contents – Year 2011
Participation KR20=0.69	Regular meetings <u>frequency of meetings</u>; <u>meeting time for staff comments/questions</u>; Briefing meetings; <u>frequency of briefing meetings</u>; <u>briefing time for staff comments/questions</u>; Information about investment given by management; Financial information given by management; Staffing information given by management; consultative committee set up; attitude surveys used.
Team working KR20=0.57	<u>Proportion in teams</u>; task rotation within teams; team training; teams have inter-dependence, specific responsibility, autonomy; quality circles used..
Development KR20=0.60	'Investor in People' standard achieved; induction training; managers have performance appraisal; all non-managers have performance appraisal; employee development forms part of strategy; <u>proportion getting workplace training</u>; <u>proportion getting off-job training; proportion getting cross-job training</u>; vacancies filled internally if possible; <u>variety of training.</u>
Selection KR20 =0.62	Selection criteria: references,skills, qualifications; experience; motivation; personality tests for managerial jobs; personality tests for non-managerial jobs; skill tests for managerial jobs; skill tests for non-managerial jobs.
Incentives KR20=0.81	Profit-related incentive for non-managers; managers have payment by results or merit pay; non-managers have payment by results or merit pay; some type of merit pay is applied; Incentive pay on basis of: individual performance, workplace performance, organizational performance; pay rises while doing same job based partly on skill increase, tasks carried out, performance.

Notes: KR20 is the Kuder Richardson reliability measure for dichotomous item scales. Underlined items are quantitative banded variables reduced to dichotomies by splitting at the median. 'Investor in People' is an externally awarded standard for people development.

Appendix Table 2:Robust regression estimates of HRM/HPWS effects on small firm employees'
IJS and OC, 2004 – with 'small' defined as 5-99 employees

	Mean IJS		Mean OC	
HR intensity:	Model (1)	Model (2)	Model (3)	Model (4)
HI:	-0.191 (-1.77+)	-0.954 (-2.98**`)	-0.190 (-2.10*`)	-0.763 (-2.96**)
HI^2:		0.151 (2.82**)	---	0.113 (2.50*)
Turning point		3.16		3.38
R-squared	0.164 N=352	0.196 N=352	0.268 N=351	0.289 N=351

Note: Cells present coefficient estimates with t-statistics in parentheses. HI is the index of high-scoring domains (range 0-5). Significance: + significant at the 10% level * significant at the 5 per cent level ** significant at the 1 per cent level. For controls, see Table 4.