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ABSTRACT

HPWS in the Public Sector: Are There Mutual Gains?[1]

Few studies investigate the links between high-performance work systems (HPWS) on public sector organizational performance and worker job attitudes. We fill this gap with analyses of these links using linked employer-employee surveys of workplaces in Britain in 2004 and 2011. We find robust evidence of positive associations between the use of HPWS and organizational performance in the public sector but no associations with worker attitudes. The implication is that, in contrast to similar work on the private sector in the United States (Appelbaum et al., 2000) HPWS is not delivering mutual gains for employers and employees in the British public sector.

JEL Classification: J28, L23, M50, M54

Keywords: public sector, HRM, HPWS, workplace performance, job satisfaction, organizational commitment, trust

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1. Introduction

During the 1990s a series of studies, mostly in the USA and focusing on the private sector, sought to establish a link between human resource management (HRM) practices and firm performance. An idea emerging from this research was that the performance effects were associated with, and perhaps reliant upon, HRM having positive impacts on employees, in terms of incentives, motivation or wellbeing. Kochan and Osterman (1994) drew such ideas together in their concept of the 'mutual gains' from HRM practice. Appelbaum et al (2000) promoted the concept of 'high performance work systems' (HPWS) and through a study of manufacturing evaluated their effects in the two perspectives inherent in 'mutual gains': productive performance and employee welfare and motivation. The positive findings reported by these authors on both types of outcome have influenced a widespread perception of HPWS as benefiting both employers and employees. Meta-analytic study of the HRM-performance linkage (Combs et al. 2006) has generated further evidence of positive effects on firm performance associated with HPWS or with its cognate form, strategic human resource management (SHRM). Research concerning effects on employee welfare and motivation as yet lacks a convincing systematic review but results from Britain include a number of affirmations (e.g. Guest, 1999; White and Bryson, 2013; Wood and Ogbonnaya, 2018).

So far, however, the public sector has largely been ignored in research on HPWS. There have certainly been studies of HRM in the British public sector (see next section for review), but they generally focus on a single branch (e.g., schools, healthcare, or local government) and highlight a single type of HRM development, such as performance-related pay or team organization. This

picture of somewhat fragmented public sector HR research also seems applicable to a number of other countries (see Burke et al., 2013).[2]

The aim of the present research is to consider the British public sector as a whole and to assess whether the HPWS concept has a similar application there to what has been found in the private sector. In designing this research, we closely follow the lead of Appelbaum et al. (2000), so that we can see how far their findings, deriving from private sector manufacturing, extend to the British public sector. Accordingly, the research examines the relationship of HPWS to both workplace performance and to employee welfare and motivation. The primary contribution of the study is to provide a baseline assessment of the role of HPWS in the public sector, against which future developments can be monitored. A secondary contribution of the research arises through coverage of two time-points, one before and one after the 2008 recession: over-time comparison assesses the resilience of HPWS to changed circumstances.

We exclude public sector workplaces with fewer than 50 employees because small public sector workplaces are, in our view, somewhat distinct and require a separate theoretical and analytical treatment analogous to small firms in the private sector (Cardon and Stevens, 2004).

The next section of this article outlines the situation of the British public sector, and reviews previous empirical contributions concerning HRM in the public sector. The third section reviews the HPWS concept while the fourth adapts this to the (British) public sector. There then follow two sections that describe the study's methods, and report results. The final section summarizes and discusses the findings.

[2] Wood and de Menezes (2011) include public sector workplaces along with private sector in their study, and remark that the public sector has similar results to the private sector, but do not provide details. Other studies that appear to cover both sectors but without disaggregation by sector include Godard (2001) and Ramsay et al. (2000).

The notion of HPWS will be clarified in subsequent sections. Initially, we merely stress that HPWS is nested within HRM as a configuration of practices that has a performance orientation. Alongside our discussion of HPWS we sometimes refer to HRM in a broader sense, especially when this is the term adopted in other publications.

The main new findings of the research are, first, that on average across the public sector, increased adoption of HPWS results in higher workplace performance according to a number of criteria, and this relationship is resilient to the post-2008 'austerity' regime. Secondly, and in contrast, there is no indication of HPWS having a positive effect on employees' experience of work as reflected in their job attitudes or measures of wellbeing. The effects of HPWS therefore appear more favorable to public sector employers than employees. This contrasts with the classic 'win-win' results of Appelbaum et al. (2000) in the private sector.

2. The public sector background to HRM development

Our comments on this large topic are necessarily brief and selective. For a wider review see Burke et al. (2013). We focus on those aspects of the public sector background that help to explain how our research has been structured.

Public services and public administration, in Britain as in other European countries, reached a critical juncture during the 1990s (Esping-Anderson, 1996). Underlying pressures came from demographic developments, notably increasing longevity and in-migration flows, and higher popular aspirations with respect to education, health, and consumption. These partly conflicting pressures led to demands for improved services, coupled with popular resistance to increased taxation. In response, British governments of both left and right persuasions have been asking the public services to 'do more with less' by operating more cost-effectively and by embracing

various types of organizational and technical innovation. Despite (or perhaps because of) the imposition of tighter budgets and restrictions on pay increases, the British public sector in 2014 appeared to lag considerably in terms of conventional productivity measures behind France, Germany and the European average (ONS, 2017: Figures 1-3).

Farnham and Horton (1996) have proposed that there are distinctive features of the established tradition of people management in the public sector. These include 'paternalism', with an emphasis on welfare provision and staff wellbeing (see also Russell, 1991, for historical examples); collectivism, with acceptance of high union density; and a conscious seeking to be 'model employers'. Gould-Williams (2004) suggests that these characteristics have not fostered a concern for efficiency or a drive to reduce labour costs. He observes that there has emerged an external political pressure to drive change forward, including through the adoption of private sector approaches to HRM (Gould-Williams 2004: 67). A salient outcome has been contraction of public sector employment. During the 1990s the British public sector experienced a net loss of 800,000 jobs, 300,000 of which went in the single year 1993 (Hicks et al., 2005). After a few years of recovery during the early 2000s, further large-scale cuts were initiated during the 'austerity' regime that followed the 2008 recession: current estimates suggest a cumulative reduction from 2008 of about one million jobs is in process. Another feature of politically driven change in the public sector has been the advance of 'marketization' through outsourcing of services, competitive tendering and privatization (LeGrand and Bartlett, 1993); however, Bach et al (2009) conclude that this process was slowing by the early 2000s.

Against this turbulent background, the development of HRM in the public sector in the past two decades has been steady. This development can be discerned through descriptive findings in the

reports of the 1998, 2004 and 2011 Workplace Employment Relations surveys (WERS) that provide nationally representative coverage of British workplaces (Cully et al., 1999; Kersley et al., 2006; Van Wanrooy et al., 2013). A summary sectoral comparison in Kersley et al. (2006: 314-6) concluded that public sector HR development had been moving progressively ahead of the private sector. For a more detailed exposition, see Bach et al. (2009: 324-9), who discern a 'performance orientation' and emulation of private sector HRM, alongside the more traditional welfare emphasis, in the public sector's HRM development across the late 1990s and early 2000s.

Since 2000 there have been several British studies examining the performance consequences of HRM practices within the British public sector. Gould-Williams and Davies (2005) surveyed several local government departments, finding positive impacts from team-working organization, and drawing attention to the importance of trust in management as an intervening variable. A larger-scale study using the 2003 Local Government Workplace Survey (Gould-Williams and Gatenby, 2010) also reported positive effects of team-working practices on individual attitudes and performance.

There has been little research on HRM and school performance outside the USA. For Britain, Bryson et al. (2018) show that school performance benefits from HPWS and especially from intensified recruitment/selection and training practices, while pay-for-performance practices have no positive impact. In a companion paper Bryson and Green (2018) found HRM practices were deployed more intensively in state schools than observationally similar private schools, and that performance returns to HPWS were confined to the state sector schools. For healthcare organizations, Harris et al. (2007) carried out a review of HRM and performance and bewailed

the lack of British research on this topic. There is little sign of this gap being filled with quantitative research in more recent years, but Hyde et al. (2013) is a qualitative investigation of how NHS staff conceptualize high performance HRM; and for the Netherlands, see the health case-study by Boselie (2010). There is an international literature on job satisfaction, work strain and burnout among healthcare occupations (e.g. Hsieh et al., 2012; Noblet et al., 2007), but little on HRM's role in this regard. However, Canadian research by Rondeau and Wager (2016) showed that a combination of 'quality of working life' and 'high involvement' practices significantly reduces nursing staff turnover.

3. What is HPWS and what does it do?

In this section and the next, we first sketch what we believe are the main ideas about HPWS that have come from private sector research, and then debate how far such ideas can be expected to transfer to the public sector.

HPWS are generally understood, in the private sector literature, as systems of practice that form a cohesive and integrated set designed to maximize organizational effectiveness. A system or strategic perspective distinguishes between HRM practices adopted by an organization in a piecemeal way, or as a re-branding of traditional personnel management, and more extensive initiatives that cross several domains of people management and are directed at performance goals.

The types of practice that need to be integrated into an HPWS, according to Appelbaum et al. (2000), especially concern employee participation in decision-making, problem-solving and change processes, and team-working forms of work organization. These are supported by recruitment processes geared to building a workforce committed to high performance goals (see

Locke, 1996), training and development to extend skills and help employees take on variable job roles, and incentives such as group/workplace bonuses, or pay progression linked to performance appraisal.

To provide an underpinning rationale for this specification, Appelbaum et al. (2000) offered a conceptual model labelled AMO, or ability-motivation-opportunity, that stems from earlier work by one of the co-authors (Bailey 1993); this framework has been utilized, explicitly or implicitly, in many subsequent studies (see Marin-Garcia and Tomas, 2016).[3] HPWS practices are conceived to impact performance through their enhancement of employees' ability (A) and motivation (M), and by providing structures of opportunity (O) through which able and motivated employees can participate to achieve improved results. Management's task is to construct sets of practices that generate {A, M, O} as intermediate employee outcomes, contributing eventually to improved organizational performance.

Although this was not an explicit part of the Appelbaum et al. (2000) framework, we suggest that it is also helpful to link AMO with the resource-based view (RBV) of the firm (Penrose, 2003[1959]; Barney, 1995), especially as applied by Becker and Huselid (2006) to strategic human resource management (SHRM). An organization that has embedded HPWS/SHRM practices into its operational process has thereby created a managerial resource that is capable of generating performance outcomes across successive cohorts of employees. In economics, this type of resource is termed a 'technology' and that also has useful connotations. In both the

[3] There are other conceptual and theoretical frameworks that have been applied to research on the effects of HRM. For example, social exchange theory has been influential in studies that have an applied social psychology orientation. We take AMO as our conceptual basis largely because of its historical position in the development of research on HPWS.

managerial and economics perspectives, it is important to emphasize the *integration* of HRM practices. A multiplicity of complementary practices gives rise to a 'strong system' (Bowen and Ostroff, 2004) communicating a clear and influential message to employees. A similar idea is contained in the oft-repeated prescription that practices must be 'bundled' to achieve full effectiveness. Indeed, a bundled high intensity system of HRM practices is often referred to in this literature as 'best practice HRM'. This does not mean, however, that only one configuration of HRM practice is prescribed. Rather, an organization can and should choose from the wide range of available practices a set that is relevant to its own circumstances and performance goals, thereby achieving the uniqueness that is required by the competitive perspective of RBV. Each firm-specific SHRM solution is equally a realization of best practice (see Becker and Huselid 2006, for amplification).

There have been two main types of outcome on which private sector HPWS research (including its forerunners) has focused. The primary interest, especially in the USA, has been on overall firm or workplace performance, as represented in profitability or productivity. We do not foreground particular exemplars, since these would be familiar to most readers; for reviews see Bloom and van Reenen (2010) and Combs (2006). Mostly this type of research has ignored intermediate outcomes of the AMO types, leaving them as a 'black box'. However, there has been a growing body of research focusing on 'motivation' specifically. Study of motivational outcomes has been facilitated by the development of trustworthy measures of employee attitudes such as job satisfaction and organizational commitment (see Harrison et al., 2006); such attitudes can be equated with motivation by theoretical arguments, e.g. see Latham and Locke (1990). Interest in employee motivation and 'wellbeing' has been prominent in British research, where labels such as 'high commitment' or 'high involvement' HRM practices have often been

proposed (e.g. Wood and Ogbonnaya, 2018). 'Ability' and 'opportunity' have not received similar consideration as outcome variables,[4] possibly because of the lack of widely accepted measures. A notable exception is the study by Collins and Smith (2006), focusing on knowledge exchange and knowledge combination activities as a type of employee 'ability' that supports performance in high-technology enterprises.

4. Applying HPWS research concepts to the Public Sector

A study across all parts of the public sector is encouraged by the pressures for change and financial efficiency that are common to all branches (section 2). The widespread use of terms such as 'new public management' underlines this commonality. Additionally, the existence of long-established institutional traditions across the public sector, notably unionization and the 'model employer' concept, should facilitate a sector-wide analysis.

Focusing on HPWS in a similar way to previous research in the private sector also appears reasonable given the evidence from the WERS series of a convergence of practice between sectors. Measures of HPWS practice that are proven in private sector research can be assumed serviceable for the public sector unless proven otherwise. Moreover, the AMO concept has a logical character that renders it widely transferable, given the assumption that an organization wants employees to contribute to enhanced performance. For example, it would be inconsistent to have this as a goal *and* not offer opportunities to employees to contribute.

[4] Numerous studies have considered ability or opportunity as input variables by identifying these concepts with particular subsets of HRM practice (see Marin-Garcia and Tomas, 2016, for examples). This however is inconsistent with the system or strategic perspective of HPWS/SHRM where the integration of practices is stressed.

Doubts about a public sector project arise, however, when one considers dependent variables, whether at the final performance level or at the intermediate outcome level. Most obviously, the public sector lacks a performance maximand such as profit or net worth. However, we judge this to be a superficial objection. Public sector organizations are increasingly 'judged by results', and in many branches of the sector aggregate outcomes provide highly visible if somewhat crude criteria for evaluation, e.g. examination results in the case of schools. Financial budgets and targets are also emphasized to the point where managers and professionals can hardly avoid financial awareness.

Less easily dismissed are doubts about intermediate outcomes of HPWS, specifically motivation. Repeated budgetary and staffing cuts may sap commitment, thus undermining any positive impact of HPWS (see Coyle-Shapiro and Kessler, 2000). Another issue is whether work strain and burnout may be exacerbated by the demands made through HPWS (Ramsay et al., 2000). Furthermore, theoretical contributions from sociology suggest that public service employees have distinctively service-oriented types of values and motivation, with which conventional attitudinal measures may not connect (Selznick ,1957; Etzioni, 1975). Gallie et al. (1998: 255-9) provide supporting evidence for this view.

According to the AMO heuristic, HPWS may enhance individual contributions through increased 'ability' or 'opportunity' as well as through 'motivation'. Neathey and Arrowsmith (2001) provide a case study of the implementation of the Working Time Regulations in the NHS that

illustrates scope for increasing staff participation. The difficulty in researching the ability and opportunity outcomes on a larger scale lies in the absence of established measures.[5]

Research aims

On the basis of our review it appears reasonable to assess the effects of HPWS in the public sector along the same broad lines as did Appelbaum et al. (2000) in their investigation of the private sector. The primary aim accordingly is to assess the association of HPWS with aggregate workplace performance and innovation. We expect to find that this association is positive.

To complete the parallel to the Appelbaum et al. (2000) exemplar, we also assess the association of HPWS with employee motivation and wellbeing, though it is unclear, on the basis of previous theory and evidence, what prediction can be made. Here, we also need to consider whether budgetary and staffing cuts affect the association.

5. Research methods – data, variables, analysis

The study is concerned with HPWS and its relations with outcomes at the level of the workplace: when considering performance, we used management reports on the workplace, and when considering motivation, we used workplace averages of employee attitudes. We examined two years, 2004 and 2011, with the Workplace Employment Relations Survey series (WERS). WERS 2004 is useful in providing comparison with several studies of HRM or HPWS that have focused on the private sector at that date (e.g., Brown et al., 2008; Storey et al., 2010; Wood and de Menezes, 2011; White and Bryson, 2013). Analysis of WERS 2011 is valuable in

[5] Some studies have claimed to represent ability or motivation through sets of HRM practices (see Marin-Garcia and Tomas, 2016). In our view this approach confuses independent with outcome variables.

considering whether the effects of HPWS changed in the altered circumstances for the public sector in the post-recession 'austerity' period. As noted in the Introduction, our analysis was confined to workplaces with at least 50 employees. Information was provided through interviews with senior managers responsible for HRM, and by a linked self-completion questionnaire completed voluntarily from a sample of up to 25 employees per workplace. Further information on the WERS 2004 and 2011 surveys is available from the UK Data Archive and in Van Wanrooy et al. (2013).

The overall response rates for WERS 2004 were 64 per cent for the manager interview and 61 per cent for the employee self-completion survey. For the purposes of the present research there is management information for 434 public sector workplaces and linked employee information from 362. WERS 2011 was conducted three years after the major financial recession. The survey response was (like most other social surveys at this time) somewhat depressed, with a management response rate of 46 per cent and a response of 50 per cent from the sampled employees. However, the total sample size was increased in 2011 and the proportion of public sector workplaces within the achieved sample also increased, from about 30% in 2004 to 40% in 2011. For the public sector subsample, there was management information from 769 workplaces and linked employee information from 550.

As the data are cross-sectional, our research is not in a strong position to identify causality. However, an implicit time dimension is introduced by the fact that HPWS tend to be developed over a substantial period, whereas the outcomes considered in the present research refer to the current situation or the past year. This makes it somewhat less plausible to suppose reverse causation.

Dependent variables

Analyses concern a range of workplace performance measures and a range of employee attitude measures. Details are shown in Appendix Table 1, while the following summarizes the nature of the measures.

(1) We used ratings of three aspects of performance made by the respondent manager, relative to other similar workplaces. The aspects are financial performance, labour productivity, and quality of service or product. Ratings are on a 5-point scale ranging from 'a lot below average' to 'a lot better than average'. These are assumed to be cardinal (equal interval) measures, in accordance with the customary treatment of opinion and attitudinal responses by applied psychologists, and increasingly by economists (e.g., Ferrer-i-Carbonell and Frijters, 2004.). An overall measure summing across the three ratings is also analysed; support is provided by reliability (Cronbach alpha) measures of 0.67 in 2004 and 0.68 in 2011. A potential limitation with these questions is the subjective nature of the ratings, which may bring unobserved individual variables into the picture and reduce precision. None the less, informative results have previously been obtained with these or similar questions; see e.g. Ramsay et al., 2000; Guest et al., 2003; Wu et al., 2015; Bryson et al., 2018, including in the public sector (Bryson et al., 2017). Forth and McNabb (2008) investigated the relationship between these subjective measures and objective (record-based) measures of performance for a subsample of the WERS 2004 data. They found positive correlations between these measures in the range 0.4 to 0.6 and judged these findings to be somewhat reassuring. Delaney and Huselid (1996) used similar performance measures in their USA-wide study of HRM and referred to earlier method studies there that provided reassurance about the consistency of the subjective measures with objective data.

(2) We constructed an index of the amount of change taking place at the workplace, formed by counting the number reported by the manager from a list of eight types of change in 2004; this was reduced to seven types in 2011. The 2004 survey question ranges over technical innovation (computers, other technical developments, technically new services), organizational change, changes in work techniques and procedures, changes in working time, changes in performance pay, and changes in staff involvement. The result was a 9-point scale ranging 0-8 (reduced to 0-7 in 2011, when specific reference to computers was omitted). The measure assesses innovative activity, as encouraged by British governments (see section 2). This measure of change avoids the difficulties of subjectivity and missing data, that arise with the performance ratings; distinctness from the ratings is shown by low correlations with each ratings measure,[6] so the two types of information can be regarded as complementary.

(3) We derived mean employee attitudes by workplace, from questionnaires completed shortly after the main management interview. The measures are: organizational commitment (OC) formed by summing three items that correspond to items in the Lincoln-Kalleberg measure of affective commitment; intrinsic job satisfaction (IJS) formed by summing four items that correspond to the 'work itself intrinsic satisfaction' sub-scale of Warr et al. (1979); trust in management, formed by summing five items that rate management's goodwill toward employees (van Wanrooy et al., 2013:120); and wellbeing at work, formed by summing six items (Warr, 2007). The distinctness of the measures was supported by a principal components analysis with varimax rotation. OC and IJS can be regarded as empirical implementations of mainstream work motivation theory (see Locke and Latham ,1990 and Harrison et al., 2006). Wellbeing at work is

[6] The correlations fall in the range 0.04 to 0.10 in 2004, and -0.05 to 0.03 in 2011.

of interest in the public sector because it has often been suggested that public sector employees are subject to high levels of work strain and 'burnout' (Hsieh et al, 2011; Noblet et al., 2007). Trust in management is conceived by Appelbaum et al. (2000) as closely related to OC; see also Gould-Williams and Davies (2005). All four variables were computed as means over the employee respondents at each workplace, thus they are smoothly distributed and serve as continuous measures. Alpha reliabilities for these measures were 0.85 or greater; see Appendix Table 1 for details.

Explanatory variables

The chief explanatory variable was a summative index of HPWS practices; we interpreted this as an intensity or 'strong system' measure. Information about HRM practices comes from the WERS interview with the senior manager responsible for HRM or personnel management at the workplace. We included only items that are descriptive of current practice and ignored any items that seek the manager's opinion about climate, management-employee relationships etc. In the HRM-performance literature HPWS items have usually been aggregated into a single overall index of practices (e.g., Becker and Huselid (1998:63)), and we followed this well-tried method. Altogether 43 items were used in 2004, and 44 in 2011, and these were grouped into 'domains' (participation, team-working, training/development, recruitment/selection, and incentive pay) that were tested by reliability analysis prior to pooling (see Appendix Table 2). While many items were of the simple 'present/absent' type, others were 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 referred to fairly basic HRM practices, others can be regarded as toward the sophisticated extreme (see also Cox et al., 2006): for instance, teams that select their own leader, or communication meetings that discuss staffing levels or finances. Empirical support for adopting a summative index as the HPWS measure has been provided by Combs et al. (2006), who concluded that summative scores have been about twice as predictive of performance as use of separate measures. The use of binary items in construction of the index was similar to numerous previous studies in the HRM-performance literature.

An additional explanatory variable for 2011 was based on the adoption of cost-cutting labour policies, such as wage freezes, wage cuts and short-time working, at the workplace in response to the 2008 recession. A dummy variable was scored 1 if the workplace reported using three or more such policies, and 0 otherwise. This criterion was reached by 40 per cent of the included public sector workplaces (weighted basis), while a criterion of two or more policies was reached by two-thirds.

Control variables

All explanatory analyses included control variables of a standard type. Structural variables were workplace size – number of employees (four categories: 50-99, 100-1999, 200-499, 500-plus); industry groups – commercial services (mainly but not exclusively in transport and communications), public administration (includes security and emergency services), education, healthcare, and community services (mostly cultural and sports); age of workplace (0-4 years, 5-

[7] Dichotomizing at the median is an efficient method of removing measurement error from a regressor variable (Kennedy, 1998).

9, 10-24, and 25-plus); industrial relations structure, represented by a multi-union dummy[8] and a workplace employee representative dummy. Compositional variables were percentages of female employees, of part-time employees, of those on fixed-term contracts, and of those in 'higher' and 'lower' occupational/skill categories with 'intermediate' as the reference category. See Appendix Table 3 for details.

Analysis methods

We analysed all outcomes by robust regression (Berk, 1990) whereby the computation of standard errors takes account of weighting, and heteroskedasticity where relevant.

Analyses were carried out using two alternative specifications in the HPWS variable: (1) linear, (2) linear-quadratic, i.e. the HPWS index score accompanied by HPWS-squared. The latter specification was used to examine non-linearity. Some previous work has found nonlinear effects particularly in relation to employee attitudinal and wellbeing variables (e.g., Godard 2001; White and Bryson, 2013). However, we found non-linearity to be ignorable in this set of analyses, so we have confined reporting to the linear models. Because of lower survey response in 2011, there is an increased possibility that sampling selectivity biases covariates in unobservable ways. If, however, the estimates remain reasonably stable between 2004 and 2011 this provides some reassurance about sampling bias in 2011.

6. Results

a) Workplace performance rating outcomes

[8] Multi-unionism provides a more sensitive measure than simple union recognition, because unions are recognized throughout most of the public sector. Variant analyses using union membership density were also carried out but led to no increase in explanatory power.

Table 1 below summarizes results of robust regression analyses for the three performance rating outcomes described in section 4, and also for the summated variable that is indicative of total performance. Estimates for both 2004 and 2011 are presented at-a-view in this table.

In 2004, all estimates were positively signed and were significant at the 1% level for financial performance and total performance. Sample sizes were depressed somewhat because some respondents felt unable to provide ratings. Similar results were obtained in 2011, when missing data was at a lower level, providing some reassurance concerning robustness. Estimates in 2011 for relative financial performance and for total performance were again statistically significant, while the estimates for labour productivity and service quality were weakly significant at the 10% level. Table 1 also shows estimates for 2011 of the effects of multiple cost-cutting policies connected with the 2008 recession. The estimated effects of these policies were always negative but non-significant. We also analysed variants that included an interaction term between the HPWS index and multiple cost-cutting policies. However, the interaction was not significant and we do not report estimates. A further variant analysis (not shown) omitted the recessionary cost-cutting variable; this resulted in negligible change in the effects of the HPWS index.

On the reasonable assumption that senior management respondents are well-informed about workplace performance measures, the results of this section provided evidence that HPWS development was associated with increased performance. However, we cannot exclude the possibility that current performance is correlated with past performance and that HPWS tends to be developed more in public sector workplaces with an (unobserved) *prior history* of strong performance.

Table 1: Robust regression estimates of HPWS' effects on management ratings of performance

2004	FINANCIAL	LABOUR	QUALITY	TOTAL
hpwsco:				
- b	0.045	0.017	0.010	0.070
- t	3.77**	1.28	0.94	2.70**
N, R-sq.	364,0.112	349,0.109	386,0.213	337,0.144
2011				
	FINANCIAL	LABOUR	QUALITY	TOTAL
hpwsco:				
- b	0.027	0.019	0.018	0.061
- t	2.64**	1.81+	1.70+	2.43*
recession:				
- b	-0.166	-0.028	-0.063	-0.333
- t	-1.40	-0.32	-0.66	-1.41
N, R-sq.	642,0.110	627,0.102	663,0.081	609,0.102

hpwsco=index of HPWS practices implemented
recession=at least 3 cost-reducing recessionary policies.
Effects are fractions of a unit on the (1-5) rating scale or (3-15) summative scale.
All models include full controls, see Appendix Table 2.
Significance: + weakly significant at the 10% level * significant at the 5 % level, **significant at the 1 % level.

(b) Workplace changes ('innovation')

The estimated effects of HPWS on workplace changes are shown in Table 2. In both the 2004 and 2011 data, there was a positive effect, significant at the 1% level, of HPWS on the number of workplace changes being implemented. The magnitude of estimates was also somewhat similar across years. A possible issue with the change measure is that it included items concerning introduction of performance related pay (PRP) and new initiatives to involve employees in changes. These items may overlap with the HPWS index leading to inflation of the estimated effect. To test this, we re-ran the estimates first omitting the PRP item and then both the PRP and involvement items; these alternative measures had respectively an 8-point and a 7-point range in 2004 (7-point and 6-point in 2011). The effects remained significant and positive although slightly reduced in magnitude. In 2011, the application of multiple cost-cutting policies in response to the 2008 recession was also significantly associated with an increased adoption of

workplace changes. Overall, the results from the analysis of the innovation counts provided reasonably persuasive evidence that HPWS was assisting public sector management toward change objectives.

Table 2: Robust regression estimates of HPWS' effects on index of changes implemented at workplace

2004	measures of change:		
hpwsco:	9-point	8-point (0.7)	7-point
- b	0.124	0.119	0.097
- t	3.70**	3.76**	3.46**
N, R-sq.	434,0.186	434,0.174	434,0.166
2011			
	8-point	7-point	6-point
hpwsco:			
- b	0.102	0.097	0.067
- t	4.95**	4.84**	3.72**
recession:			
- b	0.577	0.563	0.067
- t	2.92**	2.88**	3.72**
N, R-sq.	708,0.157	708,0.154	708,0.142

hpwsco=index of HPWS practices implemented;
recession=at least 3 cost-reducing recessionary policies. 9-point measure=0-8 changes ... 6-point=0-5 changes.
All models include full controls, see Appendix Table 2.
Effects are fractions of a unit on the change index.
Significance: ** significant at the 1 % level.

(c) Performance mechanisms – motivation and wellbeing

The effects of HPWS on public sector employees' wellbeing and motivation is examined through analyses summarized in Table 3. Estimated effects of the HPWS index were indistinguishable from zero in both 2004 and 2011, and this applied to all four employee attitudinal measures – OC, IJS, trust and wellbeing. Thus, we found no evidence to suppose that HPWS enhanced employees' experience of work in the public sector. In 2011, the adoption of multiple cost-cutting recessionary policies adversely affected public sector employees' organizational commitment, while the effect on trust in management was also negative and weakly significant

at the 10% (these findings accord with the local government observations of Coyle-Shapiro and Kessler, 2000). Interactions between HPWS and recessionary policies were explored in variant analyses but the interaction was always non-significant (results not shown). Thus, the results concerning HPWS and employee attitudes appeared to be independent of the imposition of cost-cutting 'austerity' policies.

Table 3: Robust regression estimates of HPWS' effects on workplace-mean employee attitudes

2004				
hpwsco:	OC	IJS	Trust	Wellbeing
- b	0.001	-0.002	-0.028	-0.041
- t	0.10	-0.12	-0.75	-1.40
N, R-sq.	362,0.394	362,0.237	362,0.304	362.0.256
2011				
	OC	IJS	Trust	Wellbeing
hpwsco:				
- b	0.002	-0.001	-0.004	0.019
- t	0.14	-0.05	-0.14	0.63
recession:				
- b	-0.372	-0.060	-0.603	0.455
- t	-3.05**	-0.29	-1.95+	1.33
N, R-sq.	550, 0.391	550,0.322	550,0.175	550,0.371

hpwsco=index of HPWS practices implemented
recession=at least 3 cost-reducing recessionary policies
OC=oganizational commitment, IJS=intrinsic job satisfaction
Notes: All models include full controls, see Appendix Table 2.
Effects are fractions of a unit on a 1-5 response scale.
Significance: + significant at the 10 % level, ** significant at the 1 % level.

Additional variant analyses

Several sets of variant analyses were performed as checks on our design choices. (1) We carried out separate analyses on the education subsample and the health subsample, and tested differences in coefficients between them.[9] Since there are five industry groups, affording

[9] These were the only industries to have sufficient sample size for separate analysis in both years.

potentially 10 pairwise comparisons, one requires significance at least at the 1% level to have confidence that results reliably differ. In 2004, just one test satisfied this criterion: the coefficient of HPWS on perceived labour productivity was significantly positive in education but significantly negative in health. In 2011 however the difference disappeared, with both industries showing positive and significant relationships for labour productivity as well as for total performance. With respect to attitudinal measures, there were no significant differences between education and health. HPWS effects on motivation and wellbeing were absent in both industries, with the sole exception of a positive effect on wellbeing for employees in education for 2011.

(2) We recomputed the workplace-mean attitudinal outcomes excluding respondents who had managerial or professional jobs. Thereby the analysis was focused on intermediate and lower skilled grades who might gain more from HPWS. However, once again the HPWS effects on motivation and wellbeing were non-significant.

(3) We carried out parallel analyses, for the performance and workplace change analyses only, with all control variables omitted. Estimated HPWS effects were rather stable across the full-control and no-control analyses, while overall R-squared statistics were always substantially reduced when controls were absent. This suggests that omitted variable bias was not severe in these analyses (see Altonji et al., 2005, for the logic of this conclusion).

7. Conclusions and Discussion

Our aim in this research has been to assess whether the findings of private sector research into the effects of HPWS, such as Appelbaum et al. (2000), generalize to the public sector. We examined both performance outcomes that are of concern to employers, and attitudinal outcomes

that reflect employee motivation and wellbeing. As with most private sector research, we confined the analysis to 'large' workplaces, namely those with at least 50 employees. From a method viewpoint, a feature of our research has been its concern with constructive validity: we examined two distinct periods, using surveys with partially different sets of HPWS items, and we used multiple measures both for the workplace-performance outcomes and for the employee-attitude outcomes.

The main findings of the research contrast across the two types of outcome. There is persuasive evidence that HPWS positively affects performance and innovation in public sector workplaces, but no evidence that HPWS affects employee attitudes either positively or negatively. Whereas in the private sector HPWS has been characterized as a 'win-win' or 'mutual gains' policy-set, in the public sector it seems that it provides gains only for employers. However, the latter judgement may reflect limitations on measurement, discussed further below.

Focusing on the performance outcomes in more detail, we have advised caution because of the subjectivity of performance ratings. However, the estimated effects of HPWS are similar across years, and if anything become somewhat clearer in 2011 (with larger sample size) than in 2004, as they should do if estimation is consistent. Moreover, the complementary outcome measure based on the number of types of change implemented at the workplace is of a more objective type, and it returns consistently positive and significant effects of HPWS. Overall, it is reasonable to conclude that the down-side of the subjective ratings is mainly reduced precision rather than bias, as suggested by Forth and McNabb (2008).

The lack of evidence for an effect of HPWS on employee attitudes in the public sector constitutes the main departure from findings for the private sector. Consequently, the study

leaves us without an individual-level mechanism linking HPWS with workplace performance in the public sector. One cannot set aside the non-significance of findings on the grounds of poor research instruments, since the HPWS measures have previously yielded clear effects on attitudes with private sector samples, and, as outcomes, job satisfaction and organizational commitment are firmly grounded both in theory (Locke and Latham, 1990) and by evidence of their relationship to individual performance (Harrison et al., 2006). It may be however that these measures of employee attitude do not capture distinctive motivations present in the public sector, especially those of an altruistic type as suggested by some theorists. An alternative for future research in the public sector may be organizational climate scales that incorporate client-oriented items, an area of current development in several countries (e.g., Cavrini et al., 2015).

Additionally, one should recall that the AMO model points to 'ability' and 'opportunity' as other potential mechanisms for performance enhancement, alongside 'motivation'. Participative practices grow strongly as HPWS becomes intensive and this suggests that opportunities to contribute to performance are expanding for employees. However, measures of how much participative activity is taking place at individual employee level, are so far lacking in the WERS series or indeed elsewhere. HPWS also surely has some impact on ability resources, though it may be hard to demonstrate how much, partly again because of problems of measuring personal skills and competences.

Overall, one can see why public sector management has invested in HPWS development, as these systems appear positively related to the outcomes on which management is judged, and are also linked positively with the change agenda. It is less apparent from this research what public sector employees have gained from HPWS, but this may be because we have lacked measures of

their distinctive motivations, of growing participative activities, and of personal skills development. These limitations point toward future requirements for public sector research.

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Appendix Tables

Appendix Table 1: Dependent Variables – descriptive statistics (unweighted)

(a) Performance ratings by management (cardinal scale)

	2004				2011			
	range	mean	s.d.	N	range	mean	s.d.	N
financial	1-5	3.53	0.80	414	1-5	3.60	0.81	693
labour productivity	1-5	3.46	0.69	395	1-5	3.49	0.72	675
quality	1-5	3.79	0.74	435	1-5	3.83	0.76	715
alpha for the 3 items above	0.67				0.68			
sum of above ratings (listwise deletion)	3-15	10.77	1.72	382	3-15	10.93	1.76	657
workplace change (number of types)	0-8	4.48	2.03	490	0-7	3.45	1.81	769

Base is public sector workplaces with at least 50 employees, in 2004 N=490, in 2011 N=769.

(b)Workplace-mean employee attitudinal outcomes

		2004			2011		
	range	mean	s.d.	alpha	mean	s.d.	alpha
mean Organizational Commitment (OC)	3-15	11.06	1.11	0.85	11.34	1.16	0.85
mean Intrinsic Job Satisfaction (IJS)	4-20	14.89	1.27	0.87	15.02	1.49	0.87
mean wellbeing	6-30	18.77	1.66	0.85	23.38	2.04	0.91
mean trust in management	5-25	19.53	2.36	0.93	19.65	2.52	0.93

Base for means and standard deviations is public sector workplaces with at least 50 employees and matched employer and employee data, N for 2004=393; N for 2011=581. Base for Cronbach alpha reliability measures is all employee respondents with non-missing responses to scale items, with listwise deletion; N ~ 22,000 in 2004 and ~ 21,000 in 2011.

Appendix Table 2: Items Used in Construction of HPWS Measures

Domain name	**Contents – Year 2004**
Participation KR20=0.78	Meeting time; briefing time; 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	Proportion in teams; 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; proportion given off-job training; proportion given cross-job training; variety of training courses used; 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	Meetings are regular; meeting frequency; staff time in meetings; briefing frequency; staff time in briefings; subjects discussed in meetings (staffing, finance,investment); consultative committee; attitude surveys.
Team working KR20=0.57	Proportion in teams; training for team-working; teams have inter-dependence, responsibility, autonomy; quality circles used.
Development KR20=0.60	'Investor in People' standard achieved ; development included in firm strategy; proportion given workplace training; proportion given off-job training; proportion given cross-job training; variety of training courses used; induction courses used; appraisal for managers; appraisal for all non-managers; employee development is part of workplace strategy; vacancies filled internally if possible.
Selection KR20=0.62	selection criteria: qualifications, skills, references, motivation, experience; use personality tests for manager jobs; use personality tests for non-manager jobs; use skill tests for manager jobs; use skill tests for non-manager jobs.
Incentives KR20=0.81	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.

Notes: KR20 is the Kuder Richardson reliability measure for dichotomous item scales, computed over whole sample. 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 3: Control Variables - unweighted

(a) workforce composition (% of total workforce)

	2004			2011		
	mean	s.d.	N	mean	s.d.	N
higher occupations	26.62	23.32	479	37.1	25.28	746
lower occupations	26.02	29.41	480	25.43	29.22	751
female employees	60.52	24.05	490	60.73	22.13	750
part-time contracts	29.24	20.70	490	28.32	19.36	745
fixed-term contracts	8.66	13.37	441	7.68	11.28	740

Note: Base is public sector workplaces with at least 50 employees; for 2004, N=490, for 2011, N=769

(b)workplace classification - structural (dummy variables)

proportions	2004	2011
age <5years	0.080	0.050
age 5-9 years	0.073	0.072
age 10-24 years	0.181	0.181
age 25 years plus	0.665	0.698
size 50-99	0.208	0.239
size 100-199	0.200	0.194
size 200-499	0.178	0.202
size 500 plus	0.414	0.365
industry group:		
- commercial	0.102	0.124
- public administration	0.218	0.255
- education	0.257	0.293
- health	0.351	0.260
- community service	0.071	0.069
no union or one union	0.180	0.254
multiple unions	0.820	0.746
shop stewards/reps.	0.786	0.775
3+ recessionary practices	---	0.462

Note: for 2004 N=490, for 2011, N=769.