

**Exploring high performance work systems and performance: the importance of firm size**

Ning Wu  
Nottingham University Business School

Kim Hoque  
Birkbeck, University of London

Nicolas Bacon  
Nottingham University Business School

# **Exploring high performance work systems and performance: the importance of firm size**

## **Abstract**

This paper assesses the uptake of high performance work systems (HPWS) and the association between HPWS and various indicators of firm performance in small, medium-sized and large firms. Using data from the 2004 Workplace Employment Relations Survey, the analysis demonstrates that medium-sized firms use more HPWS than small firms and fewer than large firms. However, there is no relationship between HPWS and performance in medium-sized firms, in contrast to the positive relationship found in small and large firms. Many individual HPWS practices are negatively associated with performance in medium-sized firms and only off-the-job training is positively associated with multiple indicators of performance. The analysis suggests a U-shaped relationship between firm size and performance, with HPWS associated with some measures of performance in small firms and associated with financial performance only in firms employing 500 or more employees.

## **Keywords**

HPWS, small firms, medium-sized firms, SMEs, firm performance

## **Introduction**

Extensive research over the past 25 years has identified a positive relationship between an integrated bundle of human resource management practices comprising high performance work systems (HPWS) and organisational performance (Combs et al., 2006). The findings from these studies are consistent with the resource-based view of the firm (RBV), with HPWS involving a specific set of practices aimed at: increasing the quality of human capital by raising employee knowledge, skills and abilities; motivating employees to contribute greater discretionary effort; and empowering them to help deliver business goals and objectives, appearing to affect firm performance positively. The evidence to date

largely supports a universalistic view which suggests that HPWS is associated with performance irrespective of other factors such as the firm's business strategy or the growth and development stage it has reached (Combs et al. 2006; Wall and Wood 2005).

One implication of the universalistic view is that HPWS offers a potential source of competitive advantage for small and medium-sized enterprises (SMEs) in just the same manner as for larger firms. In line with the RBV, HPWS might be important for SMEs given that they lack many of the financial resources necessary to compete with larger firms, hence they may rely more on their internal assets and human capital (Deshpande and Golhar 1994). In addition, Messersmith and Guthrie (2010: 243) argue that practices introduced early on in the life of an organisation may have lasting effects and provide a basis for sustainable competitive advantage, hence decisions made concerning the implementation of HPWS at early development stages may affect future growth and performance. In support of such views, the research undertaken to date on SMEs finds that HPWS has some important positive benefits particularly in terms of higher labour productivity and lower voluntary turnover (Deshpande and Golhar 1994; Messersmith and Guthrie 2010; Sels et al. 2006a; Way 2002). However, the research also suggests that HPWS does not result in higher profitability in SMEs, as the benefits associated with it do not appear to exceed the higher labour costs incurred in its use (Sels et al. 2006a; Way 2002).

What this implies, therefore, is that there may be a size threshold in terms of the number of staff employed above which the financial benefits of HPWS begin to exceed the costs. The point at which this occurs, however, is currently unknown. Hence, this paper explores the uptake of HPWS and its relationship with performance in firms within specific size categories. In particular, the paper seeks to establish whether there is variation with regard to these matters between: the small firm sector (defined by the

OECD (2005) and the European Commission (2003) as firms with fewer than 50 employees); the medium-sized firm sector (defined by the OECD (2005) and the European Commission (2003) as firms with between 50 and 249 employees); and large firms. Relatively few studies have to date sought to address whether the adoption and impact of HPWS is size dependent, particularly in terms of the differences that might exist between small firms and medium-sized firms. It would not be unreasonable to anticipate differences given that, as discussed below, the HR issues that concern managers in medium-sized firms are often quite different from those concerning managers in small and large firms. There is, however, some evidence that a set of practices relating to the development of employees' abilities (education, training and development) does have a positive effect on performance in medium-sized firms when used together (Storey 2002). Although Storey's study focused on just one element of HPWS, the findings nevertheless suggest that a coherent package of practices could generate synergistic effects in the medium-sized firm sector.

The aim of this paper is therefore to identify whether the uptake of HPWS and its relationship with performance varies between firms of differing size, focusing particularly on variation between small firms and medium-sized firms. This is an issue of particular importance given that the medium-sized firm sector is either frequently neglected, or alternatively is grouped into an overall SME category, rather than being treated as a sector in its own right. The analysis will also inform the strategic human resource management literature by considering whether human resource management practices should be selected and designed to fit with the size of the organisation.

### **HPWS in firms of different size**

There are a number of reasons why one might expect the uptake of HPWS and its relationship with performance to vary between different sized firms. Life-cycle models suggest that different human resource problems emerge as firms develop and grow, hence the approach firms take to human resource management will depend on the growth stage they have reached (Baird and Meshoulam 1988; Greiner 1972). Looking specifically at the differences between small and medium-sized firms, Kotey and Slade (2005), Messersmith and Guthrie (2010) and Rutherford et al. (2003) suggest that the human resource problems they experience may differ in important respects. Whether these problems are best addressed by adopting HPWS may therefore also differ. Hence, to frame our own empirical analysis, the ensuing discussion explores the factors that might lead one to expect differences in the uptake and impact of HPWS between small and medium-sized and large firms.

Turning first to small and medium-sized firms, the first factor that might lead one to anticipate differences is that medium-sized firms appear to experience more acute HRM problems than small firms, these being often the most severe problems they face (Tocher and Rutherford 2009). The informal and direct management that tends to characterise small firms becomes inappropriate as firms grow (Greiner (1972), with formal HR practices becoming necessary to address greater complexity. Informal communication, for example, is insufficient to address the coordination problems that arise when workforce size increases and new levels of management hierarchy emerge, an increased division of labour becomes necessary, and job tasks become increasingly inter-related. In addition, medium-sized firms face greater problems of integration than small firms given that owners have less direct control over employee and management actions (Serrasqueiro and

Nunes 2008). This may help to explain why the adoption of HPWS increases with firm size (see for example: Forth et al. 2006; Smallbone et al. 2000), and it also suggests medium-sized firms may benefit more than small firms from developing HPWS (Kotey and Slade 2005).

A second reason why one might expect the adoption of HPWS to be deemed more appropriate in medium-sized firms than in small firms is that while the economies of scale in medium-sized firms are less than in larger firms, they are nevertheless greater than in small firms (Sels et al. 2006a: 321; Serrasqueiro and Nunes 2008). Given this, medium-sized firms may be more likely to engage in and reap benefits from workforce development (Lynch and Black 1998) as they are able to spread the fixed costs of training over a larger workforce (although for the same reason the uptake and impact of such practices may be greater in large firms than in medium-sized firms).

Third, in line with the RBV, resources internal to the firm may influence how successfully HR problems are addressed (Penrose 1959). Although medium-sized firms lack the resources available to larger firms (Storey and Westhead 1997), they have more resources to develop HPWS than small firms (Sels et al. 2006a: 321). For example, medium-sized firms are more likely to hire CEOs with greater business experience (Baron et al. 2007). They are also more likely to employ specialist HR managers (Forth et al. 2006: 21) who are likely to introduce HPWS as part of building a professional business. The recruitment of specialist managers in medium-sized firms in itself highlights the extent to which HR problems have the potential to affect firm performance negatively in the sector if they are not resolved (Tocher and Rutherford 2009: 470). Either way, medium-sized firms are generally better equipped than small firms to introduce HPWS to help resolve HR problems than are small firms, and the benefits of so doing may be more apparent.

Fourth, medium-sized firms may be as reluctant as small firms to adopt HPWS practices such as training, given that they are both likely to regard trained employees quitting the firm as an unacceptable waste of resources (Storey 2002), with high rates of employee turnover reducing the period of time over which a return can be realised on these investments. However, medium-sized firms may have better developed internal labour markets than small firms, and this will increase the chance of retaining employees and realising returns on investments in human capital (Green 1993). Hence, HPWS practices that focus on workforce development may be more widely adopted in medium-sized firms than small firms, and they may have a more positive impact.

These arguments suggest, therefore, that the uptake of HPWS in medium-sized firms may be higher than in small firms, and that the HPWS-performance relationship may be stronger. However, where differences between medium-sized firms and large firms are concerned, one might anticipate a lower uptake of HPWS and also a weaker HPWS-performance relationship in medium-sized firms than in large firms. In particular, while medium-sized firms may introduce HPWS and incur the cost involved in doing so in order to attempt to manage a greater division of labour and more hierarchical structures (Greiner 1972), such practices may not necessarily resolve the more extensive HR and integration problems they face (as in small firms, see: Sels et al. 2006b). There are a number of reasons why this might be the case. First, lacking the economies of scale available to large firms, HPWS may be relatively more expensive per employee for medium-sized firms (see: Sels et al. 2006a; Way 2002) than for their larger counterparts. Second, medium-sized firms may lack the resources to recruit managers with the specific expertise and experience to be able to optimise the design of HPWS, or the costs of recruiting such managers may increase direct costs and decrease the value added by HPWS (Sels et al. 2006a: 326). Third, the opportunities to deploy employees to make the full use of their

knowledge, skills and abilities may be more limited in medium-sized firms than in large firms. Fourth, medium-sized firms might have shorter time horizons in which to realise the benefits from investments in HPWS than large firms and thereby under-invest in human capital as the risks increase the relative costs of such practices. Hence, one might expect HPWS to be less widely adopted in medium-sized firms than in large firms and its benefits to be more limited. Indeed, if medium-sized firms adopt HPWS in order to manage increased complexity, yet such practices raise their labour costs without resolving fully the problems they face, then the performance benefits of HPWS may be greater even for small firms than for medium-sized firms.

This paper aims to shed light on these debates by addressing three main aims. The first aim is to examine the uptake of HPWS in small, medium-sized and large firms, thereby identifying whether, as anticipated from the debates above, medium-sized firms are more likely than small firms, but less likely than large firms, to have adopted a comprehensive set of HPWS practices. The second aim is to identify the extent to which the relationship between HPWS and various indicators of firm performance varies between small, medium-sized and large firms, thereby identifying whether the positive relationship that has been found in large firms (and to an extent in small firms) can also be found in medium-sized firms.

In considering the second aim, however, it is important to keep in mind that firm-size categorisations vary, particularly in terms of the manner in which medium-sized firms are defined. For example, the OECD (2005) and the European Commission (2003), as stated above, define medium-sized firms as having between 50 and 249 employees. The US Small Business Administration (2003), by contrast, defines medium-sized firms as having between 50 and 499 employees. Hence, the third aim of the analysis is to explore the relationship between HPWS and performance within different medium-sized firm



category definitions. If the HPWS-performance relationship in firms with 250-499 employees is found to be similar to the relationship in firms with 50-249 employees, this will suggest that the US approach of defining medium-sized firms as having up to 500 employees is the more meaningful in capturing a homogenous group of firms within which HPWS has similar effects. One might also argue, however, that there are likely to be significant differences between firms at the lower end of the medium-sized firm spectrum (with 50 employees) and those at the upper end of the spectrum (with up to 499 employees). As such, there is a need to evaluate the HPWS-performance relationship in smaller medium-sized firms separate from their larger counterparts. This will demonstrate the extent to which there is variation in the HPWS-performance relationship *within* the medium-sized firm sector. It will also help develop a more nuanced understanding of the size threshold above which the financial benefits of HPWS begin to offset the increased labour costs of adopting such practices.

### **Data and method of analysis**

This paper uses data from the Workplace Employment Relations Survey (WERS) 2004 management survey. WERS is designed to be nationally representative of British workplaces with five or more employees within Standard Industrial Classification major groups D to O (agriculture, hunting, forestry and fishing and mining and quarrying are excluded), when probability weighted to account for the complex nature of the WERS survey design. The survey comprises 2,295 observations with a response rate of 64 per cent (Kersley et al. 2005). Respondents to the survey are the most senior manager within the workplace with responsibility for employee relations matters.

In the first instance, this paper follows the OECD's (2005: 17) and European Commission's (2003) method of defining small firms as having up to 49 employees and

medium-sized firms has having between 50 and 249 employees. Once the public sector and observations with missing data are omitted from the analysis, this gives a categorical firm size variable with a total unweighted number of 226 workplaces in firms in the small firm category (fewer than 50 employees), 129 workplaces in firms in the medium-sized firm category (50-249 employees), and 639 workplaces in the large firm category (250 or more employees). Workplaces within this categorisation can either be single independent workplaces (whereby the whole firm consists of a single workplace) or alternatively they can be workplaces that are a part of a larger organisation. In these instances, it is the size of the larger organisation that is important in determining whether the workplace is classified as being part of a small, medium or large firm. For example, a small workplace with 10 employees is defined as a workplace within a small firm if the organisation of which it is a part has fewer than 49 employees. However, it is classified as a workplace within a medium-sized firm if the organisation of which it is a part has between 50 and 249 employees, and a workplace within a large firm if the organisation of which it is a part has 250 or more employees.

#### *The Adoption of HPWS practices by firm size*

The first aim of the paper is to evaluate the extent of adoption of HPWS in small, medium-sized and large firms separately. This is assessed by evaluating the extent to which firms have adopted 18 practices commonly identified as important within previous research (Appelbaum et al. 2000; Combs et al. 2006; Hoque 2000; Huselid 1995; Wood and de Menezes 1998). A full description of the practices and an explanation of how they are constructed are presented in Appendix Table 2.

The assessment is carried out by first cross-tabulating the 18 HPWS practices with the categorical firm size variable described above, thereby allowing Chi<sup>2</sup> analyses to be

performed to identify differences in the uptake of the practices between small, medium-sized and large firms. Second, a maximum likelihood multivariate analysis is conducted enabling a range of observable workplace characteristics that might influence the relationship between the adoption of HPWS and firm size to be held constant. The control variables used are: four dummy variables for firm age; three dummy variables relating to family ownership; and dichotomous dummy variables for manufacturing sector, union recognition and level of market competition (see Appendix Table 1 for further details).

#### *Assessing the HPWS-performance link by firm size*

i) *Dependent variables.* The assessment of the relationship between HPWS and performance in small, medium-sized and large firms is conducted using a multivariate analysis in which the dependent variables are five performance measures, of which two are HR outcome measures and three are workplace performance measures.

The two HR outcome measures are absence rate and voluntary labour turnover. Absence rate is measured as the percentage of work days lost through employee sickness or absence. Labour turnover is measured as voluntary resignation on the part of employees. Both of these measures are continuous variables that are naturally bounded between 0 and 1, thus OLS is not the best linear unbiased estimator for them (Michie et al. 2008: 39). Instead, these two variables are tabulated by quartiles and maximum likelihood survey ordered probit is used. For the absence rate measure the quartiles are: 1= high absenteeism ( $\geq 5.48\%$ ); 2= medium-high absenteeism ( $\geq 3.5\%$  &  $< 5.48\%$ ); 3= medium-low absenteeism ( $\geq 2\%$  &  $< 3.5\%$ ); and 4= low absenteeism ( $< 2\%$ ). For the labour turnover measure, the quartiles are: 1= high labour turnover ( $> 17.39\%$ ); 2= medium-high turnover ( $\geq 8.77\%$  &  $\leq 17.39\%$ ); 3= medium-low turnover ( $\geq 2.5\%$  &  $< 8.77\%$ ); and 4= low labour turnover ( $< 2.5\%$ ).

The three workplace performance outcome measures used are: labour productivity; quality of product or service; and financial performance. Respondents were asked to rate the performance of their workplace relative to other workplaces in the same industry on a five-point scale where 1='a lot below average' and 5='a lot better than average' (see the Appendix for the means of these variables). These are all subjective performance measures that may be affected by measurement error, although studies suggest that subjective and objective performance measures are positively correlated (Wall et al. 2004) and produce similar results in modelling the determinants of workplace performance (see: Forth and McNabb 2008). Given the categorical nature of these measures, maximum likelihood survey ordered probit analysis is used.

*ii) Independent variables.* The relationship between HPWS and performance is assessed using a count measure of HPWS based on the number of the 18 HPWS practices described earlier that have been adopted. Small, medium-sized and large firms are analysed separately to identify the differences in the HPWS-performance relationship between each group. The regressions control for the same workplace characteristics as controlled for in the equations described above.

#### *Assessing different firm-size definitions and variation within the medium-sized firm sector*

The final stage of the analysis seeks to identify variation in the HPWS-performance relationship within the medium-sized firm sector. This draws on different definitions of medium-sized firms to identify which of the US approach of defining medium-sized firms as having up to 499 employees, and the OECD (2005) and European Commission (2003) approach of defining medium-sized firms as having up to 249 employees, is the more meaningful in capturing a cohort of firms within which HPWS has similar effects. It also seeks to identify whether there is variation within the medium-sized firm category. The

analysis undertaken to address these issues is undertaken by subdividing the sample as follows:

- i) Small firms (5-49 employees) (48.04 per cent of workplaces)
- ii) 'Small-medium' sized firms (50-149 employees) (8.96 per cent of workplaces)
- iii) 'Large-medium' firms (150-249 employees) (3.41 per cent of workplaces)
- iv) 'Small-large' firms (250-499 employees) (3.36 per cent of workplaces)
- v) 'Large-large' firms (500+ employees) (36.23 per cent of workplaces)

The multivariate analysis described above using the count measure of the number of HPWS practices is then conducted separately within each of these firm size categories. This will help identify the size threshold above which HPWS begins to have performance benefits.

### *Weights*

The data are weighted throughout the analysis in order to account for the complex design of the WERS 2004. This weighting, which accounts for the probability of selection of the workplace into the main management sample, is essential if unbiased population estimates are to be obtained, as workplaces in certain industry sectors and large workplaces are over-represented within the WERS 2004 stratified survey design.

## **Results**

### *The adoption of HPWS practices by firm size*

The paper's first aim is to evaluate the extent to which the uptake of HPWS varies between small, medium-sized and large firms. The results of the bivariate analysis

presented in Table 1 show that medium-sized firms are more likely to use 6 of the 18 HPWS practices than are small firms ( $p < 5\%$ ), while large firms are more likely to use 8 of the 18 HPWS practices than are medium-sized firms. Medium-sized firms would appear, therefore, to be taking a significantly different approach to HPWS from that taken in small firms.

INSERT TABLE 1 HERE

As discussed above, however, it is possible that a range of observable workplace characteristics will bias the estimates of the differences between small, medium-sized and large firms. To test for this possibility, a multivariate analysis is conducted that controls (as outlined above) for industry sector, workplace age, workplace size, family ownership, union recognition and degree of competition. The results are reported in Table 2. Looking at specific practices, small firms are less likely than medium-sized firms to have off-the-job training, internal labour markets and grievance procedures, and they are slightly less likely (at the 10 per cent significance level) to have a comprehensive benefits package and equal opportunities practices. They are, however, *more* likely to have adopted quality circles. Large firms, by contrast, are more likely to have adopted performance-related pay, employee attitude surveys and quality circles than are medium-sized firms and they are slightly more likely (at the 10 per cent significance level) to have adopted a comprehensive benefits package and to have grievance procedures in place. The count measure of HPWS also confirms that the number of HPWS practices adopted in medium-sized firms is significantly higher than in small firms, and significantly lower than in large firms.

INSERT TABLE 2 HERE

Hence, notable differences in the approach taken to HPWS between small firms and medium-sized firms remain once workplace characteristics have been controlled for. It is also perhaps notable that the size of the HPWS count measure coefficient for the differences between small firms and medium-sized firms is larger than for the differences between medium-sized firms and large firms. This suggests that the approach taken to HPWS in medium-sized firms in terms of the number of practices adopted is more akin to the approach taken in large firms than that taken in small firms.

*Assessing the HPWS-performance link by firm size*

The paper's second aim is to examine the relationship between HPWS and performance in small, medium-sized and large firms. This analysis is undertaken first by evaluating the relationship between the count measure of HPWS and a range of performance outcomes.

INSERT TABLE 3 HERE

The results are presented in Table 3. Where large firms are concerned, as anticipated, the HPWS count measure is associated with: lower labour turnover; higher labour productivity; better quality of product or service; and enhanced financial performance. In small firms, it is positively associated with higher labour productivity and (at the 10 per cent level) better quality of product or service. However, where medium-sized firms are concerned, there is no evidence of an association between the count measure of HPWS and any of the performance measures asked about. Indeed, opposite to what might be expected, the coefficients for three of the five associations are negative

(though not statistically significant). It would seem, therefore, that while HPWS is positively associated with performance in large firms, and there is some evidence that it is positively associated with performance in small firms, there is no evidence that it is positively associated with performance in medium-sized firms.

To attempt to understand further why this is the case, Table 4 explores the relationship in the medium-sized firm sector between each of the 18 individual HPWS practices used in the count measure of HPWS and performance. The analysis demonstrates that several HPWS practices are negatively associated with performance (sophisticated recruitment, consultation committees, quality circles, functional flexibility, equal opportunities and grievance procedures). Other practices are positively associated with some performance measures and negatively associated with others (teamwork, team briefing and benefits). Only off-the-job training is positively correlated with multiple performance measures (labour turnover, labour productivity and quality of product/service). Hence, the lack of an association between the count measure of HPWS and performance in medium-sized firms would appear to be explained by the fact that for each of the separate performance outcomes, while some individual practices are positively associated with performance, others are negatively associated with performance. It would appear, therefore, that in medium-sized firms, the choice of which HPWS practices firms should adopt may be particularly important.

INSERT TABLE 4 HERE



*Variation within the medium-sized firm sector and alternative medium-sized firm definitions*

The final stage of the analysis is to identify whether there is variation within the medium-sized firm sector in terms of the relationship between HPWS and performance, and also to evaluate the HPWS-performance relationship using different definitions of the medium-sized firm category.

INSERT TABLE 5 HERE

The results, given in Table 5, suggest that there is no relationship between HPWS and performance in either ‘small-medium’ (50-149 employees) or ‘large-medium’ (150-249 employees) firms. Hence, there is no evidence of variation in the HPWS-performance relationship within the medium-sized firm sector as defined by the OECD (2005) and the European Commission (2003). However, the analysis also finds no evidence of a relationship between HPWS and performance in ‘small-large’ firms (250-499 employees). There would appear, therefore, to be a notable uniformity in the lack of a HPWS-performance relationship in firms with between 50 and 499 employees. This in turn suggests that in identifying a coherent and homogenous group of firms that have similar HR concerns, the US approach of defining medium-sized firms as having up to 499 employees is perhaps more meaningful than the OECD (2005) and European Commission (2003) approach of defining medium-sized firms as having up to 249 employees. It also suggests that the firm size threshold above which HPWS begins to have a positive impact on financial performance, at 500 employees, might be somewhat higher than anticipated.

## **Discussion and conclusions**

This paper had three main aims. The first was to assess the uptake of HPWS in small, medium-sized and large firms. The second was to explore the HPWS-performance relationship in small, medium-sized and large firms, in order to establish whether the relationship between HPWS and performance found in previous research in large firms (and to an extent in small firms) could also be found among medium-sized firms. The third aim was to explore the HPWS-performance relationship using different medium-sized firm definitions, and also to explore variation in the HPWS-performance relationship within the medium-sized firm sector, thereby identifying the size threshold above which a relationship between HPWS and performance emerges.

In relation to the association between the uptake of HPWS practices and firm size, the analysis demonstrates support for the small body of evidence pointing to a greater uptake of HPWS in medium-sized firms than in small firms (Forth et al. 2006; Smallbone et al. 2000). It also suggests that the approach taken in medium-sized firms in terms of the number of HPWS adopted is more akin to that taken in large firms than in small firms. This in itself points to the importance of viewing small firms and medium-sized firms as analytically distinct, given that combining them into a single SME category would appear to mask significant variation.

Turning to the paper's second aim, the analysis found, as expected, a consistent HPWS-performance relationship in large firms (see: Combs et al. 2006). It also found a positive relationship between HPWS and labour productivity and a weak positive relationship with quality of product or service within small firms. The results for small firms were also perhaps notable in that no relationship between HPWS and financial performance was identified, thus supporting the conclusions reached by Sels et al. (2006a) and Way (2002) that the positive effects of HPWS in the small firm sector may be off-set

by the higher labour costs they incur. Where medium-sized firms are concerned, however, the analysis found no evidence of a relationship whatsoever between the number of HPWS practices adopted and performance. Given that the results concerning small and large firms are consistent with previous research, it is perhaps unlikely that the findings with regard to medium-sized firms are the result of measurement error.

In explaining why there might be a lack of a relationship between the count measure of HPWS and performance in medium-sized firms, the analysis demonstrated that several individual HPWS practices are negatively associated with aspects of performance. One explanation for this is that medium-sized firms adopt these practices as purposeful attempts to resolve the HR problems that develop when workforce size increases and new levels of management hierarchy emerge, an increased division of labour becomes necessary, and job tasks become increasingly inter-related (Greiner 1972). If the introduction of HPWS is insufficient to resolve these problems, this might explain why there is no association between the adoption of such practices and performance.

The third aim of the paper was to identify variation in the HPWS-performance relationship within the medium-sized firm sector, and also to explore the HPWS-performance relationship using different medium-sized firm definitions. In the event, the analysis found no evidence of variation within the medium-sized firm category as defined by the European Commission (2003) and the OECD (2005) (i.e. firms with between 50 and 249 employees). Where the broader US definition of medium-sized firms is concerned, the analysis also found no evidence of a relationship between HPWS and performance in firms with between 250 and 449 employees. The consistent lack of a HPWS-performance relationship in firms employing between 50-499 employees therefore suggests the US Small Business Administration (2003) approach of defining medium-sized firms as having up to 499 employees may be the more meaningful in identifying a coherent category of

firms that have similar HR concerns and require specific dedicated and targeted help and advice to address the difficulties they face.

The uniform lack of a relationship between HPWS and performance in firms with 50-499 employees also calls into question claims in much of the extant literature of a universal positive relationship between HPWS and performance. Instead, the results suggest a U-shaped relationship between firm size and performance, with HPWS associated with some measures of performance in small firms with fewer than 50 employees, and with a range of performance measures (including financial performance) in large firms with 500 or more employees. The size of the firm and the stage of organisational growth and development it has reached would therefore appear to have important moderating effects on the HPWS-performance relationship. Hence, the results point to the importance of further developing lifecycle models within the strategic human resource management literature to understand the human resource practices that are associated with performance as firms develop and grow (Baird and Meshoulam 1988; Kotey and Slade 2005; Messersmith and Guthrie 2010).

Overall, this paper has pointed to notable differences between small and medium-sized firms in terms of the approach taken to HPWS, and notable differences in the relationship between HPWS and performance. A key implication of these findings is that these two firm size categories should be treated as analytically distinct, and that the SME label should not be viewed as representative of a homogenous group of firms. If future research is able to confirm the differences reported here, this will have important implications for managers in medium-sized firms, and the guidance and support offered to them. One particular interpretation would be that the business advice, guidance and support offered to SMEs should differentiate between the needs of small and medium-sized firms, and it should acknowledge that they may have very different HR concerns. In

addition, the results suggest that the advice, guidance and support currently targeted at firms with up to 249 employees could also be usefully targeted at firms with between 250 and 499 employees. The results also suggest what the advice targeted at the medium-sized firm sector might consist of. Given that there is a consistent relationship between HPWS and performance only in firms with 500 or more employees, the business advice to firms below this size threshold should arguably not involve the encouragement of a broader adoption of HPWS. It should however encourage medium-sized firms to engage in off-the-job training (see: Storey 2002) as this is positively correlated with lower labour turnover, higher labour productivity and higher quality of product/service. Even here, though, a note of caution is required given that there is no evidence in the analysis conducted here that it has a positive impact on financial performance in the sector.

Overall, therefore, the findings challenge the universal prescription of HPWS for firms of all size, and it suggests a more differentiated approach is required in the advice, guidance and support offered to medium-sized firms in particular. Arguably, viewing small and medium-sized firms as analytically distinct within both academic and policy circles will enable the nuances within the SME sector to be better understood. It will also focus attention on the need to provide different human resource advice for each firm size category separately rather than attempting to develop generic business advice that seeks to cater to the needs of SMEs as a whole.

## **Acknowledgement**

We acknowledge the Department of Trade and Industry, the Economic and Social Research Council, the Advisory, Conciliation and Arbitration Service and the Policy Studies Institute as the originators of the WERS 2004 data, and the Data Archive at the University of Essex as the distributor of the data. They are not responsible for any of the findings or claims made in the paper.

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Table 1: The use of HPWS in small, medium and large private sector firms

	Small (N=226)	Medium (N=129)	Large (N=639)	Small vs. Medium <i>Chi</i> <sup>2</sup>	Small vs. Large <i>Chi</i> <sup>2</sup>	Medium vs. Large <i>Chi</i> <sup>2</sup>
Sophisticated recruitment	.282	.283	.450	.989	.002	.031
Induction	.359	.441	.616	.290	.000	.028
Off-the-job training	.261	.516	.531	.001	.000	.846
Internal labour market	.133	.311	.273	.004	.001	.616
Performance-related pay	.210	.179	.387	.606	.001	.003
Profit-related pay	.095	.197	.167	.069	.042	.647
Performance appraisal	.479	.594	.768	.165	.000	.018
Teamwork	.234	.273	.283	.568	.296	.883
Team briefing	.224	.298	.296	.268	.126	.983
Consultation committee	.039	.103	.119	.026	.002	.630
Employee attitude survey	.174	.233	.575	.316	.000	.000
Quality circles	.170	.088	.205	.055	.375	.008
Functional flexibility	.201	.154	.258	.467	.240	.137
Benefits	.167	.358	.588	.003	.000	.004
Family friendly/flexible working	.175	.227	.224	.401	.254	.964
Equal opportunities	.099	.238	.259	.013	.000	.766
Grievance procedures	.170	.327	.526	.012	.000	.012
Job security	.128	.065	.124	.222	.933	.236

Note: All estimations are weighted.

Table 2: The use of HPWS in small, medium and large private sector firms: multivariate analysis

	Small		Large		<i>F</i>	<i>Prob.&gt;F</i>	<i>N</i>
Count measure of HPWS <sup>1</sup>	-.261	(.105)**	.184	(.081)**	21.12	.000	994
Sophisticated recruitment	.037	(.239)	.305	(.220)	4.23	.000	994
Induction	-.116	(.232)	.296	(.216)	3.49	.000	994
Off-the-job training	-.602	(.229)***	-.161	(.216)	4.14	.000	994
Internal labour market	-.796	(.260)***	-.126	(.237)	4.3	.000	994
Performance-related pay	.337	(.227)	.546	(.214)**	2.79	.000	994
Profit-related pay	-.459	(.300)	-.171	(.241)	2.28	.003	994
Performance appraisal	-.301	(.233)	.233	(.222)	4.03	.000	994
Teamwork	-.105	(.245)	.089	(.227)	1.1	.346	994
Team briefing	-.202	(.237)	-.037	(.221)	1.62	.057	994
Consultation committee	.165	(.245)	.022	(.209)	21.51	.000	994
Employee attitude survey	-.280	(.236)	.879	(.208)***	9.88	.000	994
Quality circles	.725	(.244)***	.605	(.226)***	5.68	.000	994
Functional flexibility	-.016	(.260)	.251	(.241)	1.22	.242	994
Benefits	-.429	(.233)*	.394	(.212)*	11.23	.000	994
Family friendly/flexible working	-.111	(.249)	-.214	(.233)	3.61	.000	994
Equal opportunities	-.503	(.262)*	-.080	(.243)	7.2	.000	994
Grievance procedures	-.768	(.234)***	.378	(.213)*	8.33	.000	994
Job security	.414	(.322)	.364	(.319)	0.44	.971	994

Note:

All estimations are weighted. Survey probit analysis for all individual HPWS practices except <sup>1</sup> Survey Poisson analysis.

Reference category in all equations: medium-sized firms

Coefficients given. Standard errors in brackets.

All equations control for the industry sector, workplace size, workplace age, family ownership, union recognition, and the degree of competition in present market.

\* significant at 10 per cent. \*\* significant at 5 per cent. \*\*\* significant at 1 per cent.

Table 3: The relationship between HPWS and performance in small, medium and large private sector firms

	Small (5-49)	Medium (50-249)	Large (250+)	SMEs (5-249)	Full sample
<u>Absence rate</u>					
HPWS <sup>1</sup>	.002 (.035)	.025 (.045)	-.009 (.034)	-.013 (.029)	-.013 (.021)
<i>F</i>	1.830	1.410	2.850	1.290	4.840
<i>Prob.&gt;F</i>	.050	.164	.000	.214	.000
<i>N</i>	226	129	355	639	994
<u>Labour turnover</u>					
HPWS <sup>1</sup>	.032 (.034)	-.053 (.050)	.067 (.030)**	.029 (.030)	.023 (.021)
<i>F</i>	1.840	1.350	2.600	2.030	1.850
<i>Prob.&gt;F</i>	.050	.193	.001	.018	.024
<i>N</i>	226	129	355	639	994
<u>Labour productivity</u>					
HPWS <sup>1</sup>	.095 (.030)***	-.012 (.046)	.081 (.033)**	.082 (.026)***	.063 (.019)***
<i>F</i>	1.620	1.340	1.740	1.470	1.940
<i>Prob.&gt;F</i>	.094	.199	.039	.126	.017
<i>N</i>	226	129	355	639	994
<u>Quality of product or service</u>					
HPWS <sup>1</sup>	.065 (.035)*	.021 (.054)	.069 (.024)***	.051 (.028)*	.041 (.019)**
<i>F</i>	1.150	2.290	1.180	1.430	1.760
<i>Prob.&gt;F</i>	.323	.010	.286	.144	.036
<i>N</i>	226	129	355	639	994
<u>Financial performance</u>					
HPWS <sup>1</sup>	.056 (.036)	-.005 (.053)	.058 (.026)**	.049 (.030)*	.056 (.018)***
<i>F</i>	2.640	.130	1.740	1.720	2.080
<i>Prob.&gt;F</i>	.004	1.000	.040	.056	.009
<i>N</i>	226	129	639	355	994

Note:

Survey ordered probit analysis. Coefficients given. Standard errors in brackets.

<sup>1</sup> Count measure of the number of HPWS practices used.

All equations control for the industry sector, workplace size, workplace age, family ownership, union recognition, and the degree of competition in present market.

\* significant at 10 per cent. \*\* significant at 5 per cent. \*\*\* significant at 1 per cent.

Table 4 The relationship between individual HPWS practices and performance in medium-sized firms.

	Absence rate	Labour turnover	Labour productivity	Quality of product or service	Financial performance
Sophisticated recruitment	.061(.339)	.236(.336)	-.335(.320)	-.767(.381)**	-.251(.272)
Induction	-.005(.335)	-.173(.324)	.251(.297)	.130(.349)	.023(.260)
Off-the-job training	-.407(.302)	.904(.317)***	.626(.299)**	.660(.296)**	.418(.308)
Internal labour market	.382(.330)	.650(.360)*	.157(.362)	-.115(.368)	.502(.369)
Performance-related pay	.399(.359)	.333(.326)	-.065(.373)	.369(.310)	-.143(.351)
Profit-related pay	.093(.379)	.379(.349)	.170(.375)	-.063(.457)	.200(.318)
Performance appraisal	-.322(.306)	.006(.354)	.579(.327)*	-.161(.322)	-.008(.409)
Teamwork	1.14(.380)***	-.541(.331)	-.078(.349)	-.826(.338)**	.246(.334)
Team briefing	-.664(.311)**	-.044(.298)	-.582(.356)	.942(.291)***	.078(.325)
Consultation committee	-.393(.443)	-.288(.337)	-1.195(.503)**	-.728(.478)	-.255(.363)
Employee attitude survey	.164(.326)	.138(.303)	.138(.358)	.300(.346)	-.021(.293)
Quality circles	.342(.397)	-.999(.434)**	-.477(.409)	.298(.506)	.482(.385)
Functional flexibility	-.698(.385)*	-.261(.376)	-.274(.452)	-.644(.339)*	-.668(.324)**
Benefits	.903(.321)***	-.928(.343)***	-.908(.353)**	.273(.380)	-.150(.323)
Family friendly/flexible working	.408(.392)	-.022(.394)	.676(.407)	1.403(.421)***	.290(.417)
Equal opportunities	-.080(.365)	-.287(.408)	-.766(.388)**	-.456(.352)	-1.179(.371)***
Grievance procedures	-.683(.312)**	-.399(.336)	.399(.322)	.034(.329)	-.107(.395)
Job security	-.620(.465)	.555(.538)	.161(.630)	.529(.589)	-.278(.506)
F	1.93	1.44	2.57	1.72	1.86
Prob.>F	.010	.100	.000	.028	.014
N	129	129	129	129	129

Notes:

Survey ordered probit analysis. All estimates are weighted.

Coefficients given (standard errors in brackets).

\*significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent,

Control variables entered into each equation are dummies representing industries, workplace age, workplace size, family ownership/involvement, union recognition and competitive environment.

Table 5: The relationship between HPWS and performance by firm size in the private sector

	Small firms (5-49)	Small-medium (50-149)	Large-medium (150-249)	Small-large firms (250-499)	Large-large firms (500+)
<u>Absence rate</u>					
HPWS	.002 (.035)	.029 (.071)	.082 (.049)	.061 (.091)	-.018 (.035)
F	1.830	1.690	1.730	2.270	4.360
Prob.>F	.050	.122	.137	.039	
N	226	90	39	54	580
<u>Labour turnover</u>					
HPWS	.032 (.034)	-.046 (.079)	-.083 (.067)	-.178 (.066)***	.076 (.030)**
F	1.840	1.070	1.870	3.630	2.840
Prob.>F	.050	.389	.107	.002	.003
N	226	90	39	54	580
<u>Labour productivity</u>					
HPWS	.095 (.030)***	.071 (.061)	-.122 (.062)*	.086 (.081)	.091 (.034)***
F	1.620	4.240	1.350	2.150	2.910
Prob.>F	.094	.001	.259	.049	.002
N	226	90	39	54	580
<u>Quality of Product or service</u>					
HPWS	.065 (.035)*	.079 (.067)	-.044 (.055)	.072 (.088)	.078 (.025)***
F	1.150	1.400	.500	1.980	1.630
Prob.>F	.323	.217	.826	.071	.103
N	226	90	39	54	580
<u>Financial performance</u>					
HPWS	.056 (.036)	.034 (.069)	-.089 (.048)*	.002 (.088)	.072 (.029)**
F	2.640	.480	1.140	4.140	2.680
Prob.>F	.004	.850	.363	.001	.005
N	226	90	39	54	580

Note:

Survey ordered probit analysis. \*\*\* significant at 1 per cent \*\* significant at 5 per cent \* significant at 10 per cent.

<sup>1</sup> Count measure of HPWS practices used by a firm.

All equations control for industry sector, workplace size, workplace age, family ownership, union recognition and the degree of market competition.

Appendix 1 Variable means

	Small	Medium	Large	Full sample
<i>HPWS practices</i>				
Count measure of the number of HPWS practices used	3.599	4.884	6.651	4.967
Sophisticated recruitment	.282	.283	.450	.349
Induction	.359	.441	.616	.471
Off-the-job training	.261	.516	.531	.400
Internal labour market	.133	.311	.273	.210
Performance-related pay	.210	.179	.386	.276
Profit-related pay	.095	.197	.167	.136
Performance appraisal	.479	.594	.768	.608
Teamwork	.233	.273	.283	.258
Team briefing	.224	.298	.296	.262
Consultation committee	.039	.103	.119	.079
Employee attitude survey	.174	.233	.575	.340
Quality circles	.170	.088	.205	.174
Functional flexibility	.201	.154	.258	.218
Benefits	.167	.358	.588	.357
Family friendly/flexible working	.175	.227	.224	.201
Equal opportunities	.099	.238	.259	.180
Grievance procedures	.170	.327	.526	.331
Job security	.128	.065	.124	.119
<i>Performance measures</i>				
Absence rate	3.045	2.682	2.692	2.860
Labour turnover	2.490	2.668	2.191	2.394
Labour productivity	3.653	3.661	3.445	3.571
Quality of product or service	4.197	4.076	3.900	4.064
Financial performance	3.442	3.666	3.592	3.529
<i>Workplace age</i>				
0-4 years	.129	.078	.086	.106
5-9 years	.176	.159	.146	.162
10-19 years	.275	.208	.237	.251
20+ years	.421	.555	.531	.481
<i>Workplace size</i>				
5-9 employees	.508	.429	.387	.451
10-24 employees	.404	.171	.291	.330
25-49 employees	.088	.130	.148	.117
50-99 employees	.000	.185	.079	.054
100-249 employees	.000	.084	.057	.033
250-499 employees	.000	.000	.025	.010
500+ employees	.000	.000	.013	.005



(Continued)

	Small	Medium	Large	Full sample
<i>Family ownership</i>				
Not family owned	.381	.482	.817	.566
Family owned/owner not involved	.070	.221	.111	.105
Family owned/owner involved	.549	.297	.072	.329
Manufacturing	.193	.120	.062	.132
Degree of competition	.674	.768	.759	.719
Union recognition	.033	.059	.313	.147

Note: All estimations are weighted.

## Appendix 2 Construction of HPWS practices

HPWS practices	Items
Sophisticated recruitment	Conducting either personality/attitude test or performance/competency test in filling the largest occupational group (LOG) vacancies.
Induction	A standard induction programme designed to introduce new non-managerial employees belonging to the LOG to the workplace and such induction activities normally last for at least 2 days (if counted in days) or at least 16 hours (if counted in hours).
Off-the-job training	Over 60 per cent of experienced LOG has been given time off from their normal daily work duties to undertake training over the past 12 months.
Internal labour market	Preference is given to internal applicants, other things being equal, over external applicants, or internal applicants are the only source in case of filling vacancies.
Profit-related pay	60 per cent of non-managerial employees at this workplace receive profit-related payments or profit-related bonuses.
Performance appraisal	More than 60 per cent of non-managerial employees at a workplace have their performance appraised at least annually.
Teamwork	Over 60 per cent of LOG at a workplace are working in formally designated teams and either of the following conditions are met: team members depend on each other's work to be able to do their jobs; team members jointly decide how the work is to be done.
Team briefing	Meetings held at least weakly between line managers or supervisors and all the workers (team briefing).
Consulting committee	Are there any committees of managers and employees at this workplace, primarily concerned with consultation, rather than negotiation? (joint consultative committees, works councils or representative forums.)
Employee attitude surveys	Have you or a third party conducted a formal survey of your employees' views or opinions during the past two years and the results of the survey had been made available in written form to those employees that took part.
Quality circle	Non-managerial employees have been involved in problem-solving or quality circles or continuous improvement groups.
Functional flexibility	At least 60 per cent of the LOG is formally trained to do jobs other than their own.
Benefits	Three or more of the following non-pay terms and conditions apply to the LOG: employer pension scheme, private health insurance, more than four weeks of paid annual leave (excluding public holidays), sick pay in excess of statutory requirements.
Flexible working/Family friendly practices	Three or more of the following are practised at this workplace: working at or from home in normal working hours, job sharing schemes, flexitime where an employee has no set start or finish time but an agreement to work a set number of hours per week or per monthly, any female employees going on maternity leave from this workplace receive their normal full rate of pay, working only during school term-time, workplace nursery or nursery linked with workplace, financial help with child-care, financial help with the care of older adults, a specific period of leave for carers of older adults.

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Equal opportunity	Recruitment and selection have been monitored or reviewed to identify indirect discrimination by at least three of the following characteristics: gender, ethnic background, disability and/or age; or promotion procedures have been monitored or reviewed to identify indirect discrimination by at least three of the following characteristics: gender, ethnic background, disability and/or age.
Grievance procedures	Workplaces that have all of the four items are deemed as having a formal grievance procedure: a) there is a formal procedure for dealing individual grievances raised by any employee at this workplace; b) employees are required to set out in writing the nature of the grievance; c) employees are asked to attend a formal meeting with a manager to discuss the nature of their grievance; and d) employees have a right to appeal against a decision made under the procedure.
Job security	Job security or no-compulsory redundancies policies apply to the LOG at a workplace

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