Article

International Small Business Journal
2014, Vol. 32(5) 545–570

DOI: 10.1177/0266242612465454
isb.sagepub.com
SAGE

Human resource management and performance: Evidence from small and medium-sized firms

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Abstract
This article examines human resource management (HRM) practices in small and medium-sized enterprises (SMEs). In particular, by examining the issue of causal order, it addresses a significant gap in the extant HRM–performance literature within the context of such firms. Significant simultaneous and longitudinal relationships between HRM practices and specific performance indicators are found. Controlling for past performance and thus, testing for the potential for reverse causality does not eliminate the significant relationship between human resource practices and performance. In sum, the use of human resource practices is found to positively enhance sustained competitive advantage. By explicitly examining the issue of causality in the human resources –performance relationship, this article makes a contribution to both the human resource and SME literatures.

Keywords
causal order, human resource management (HRM), performance, small- and medium-sized enterprises (SMEs)

Introduction

Given contemporary financial market constraints and limited growth in demand, smaller firms are focusing increasingly on how to utilise existing resources more efficiently and effectively (Gallego et al., 2012). Given their resource limitations, small and medium-sized firms have fewer options than their larger counterparts to improve performance. However, one resource that is common to all organisations, which has been the focus of increasing theoretical, empirical and practical attention in small and medium sized enterprises (SMEs), is that of human resources. Scholars have suggested that adopting specific human resource management (HRM) practices can improve small firm performance and sustain competitiveness (e.g. Michie and Sheehan, 2008; Patel and Cardon, 2010; Razouk, 2011; Williamson et al., 2002). In recent years there has been a growing literature

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on HRM and smaller firms. The most comprehensive account of HRM practices used in SMEs in the UK is based on the analysis of the 2004 Workplace Employment Relations Survey, which found formal human resource practices to be in common usage with a higher incidence than previously assumed (see Forth et al., 2006).

Among practitioners there is also recognition that the somewhat commonly held view of the past, that smaller firms 'do not need human resource' and/or the view that human resource practices are 'informal', is no longer applicable. In *Personnel Today*, Stephanie Sparrow (2006) emphasised that SMEs 'have shaken off their image of short-termism and amateurish people policies'. In response, Paul Sparrow, currently Director of the Centre for Performance-led Human Resources, University of Lancaster, commented that:

> Overall they [SMEs] are more advanced in people management than many believe ... Techniques such as culture-change programmes, employee-involvement schemes, team-working and devolved control systems are all evident. (Sparrow, 2006)

In the context of the European Union (EU), the dynamic between informal and formal human resource practices has been significantly influenced by the broader legal and regulatory context in which firms operate. European employment directives have contributed to more formal human resource practices; in the context of the UK, an increase in the regulation of labour under successive Labour administrations (1994–2010) is likely also to have influenced the formality of human resources.[1] Therefore, it is argued throughout this article that the external context has influenced the use of formal human resource practices significantly.

However, what has not been established is whether the use of a greater number of formal human resource practices has performance benefits for SMEs, similar to that found in numerous empirical studies of large firms (Guest, 2011). While there have been several empirical studies that examine the relationship between the use of formal HRM practices and performance, including entrepreneurial orientation and innovation, in SMEs (e.g. Messersmith and Wales, 2011) the relationship between HRM practices and the performance of SMEs remains under-researched (for exceptions see Messersmith and Guthrie, 2010; Razouk, 2011; Verreynne et al., 2011). This is likely to reflect, at least in part, the methodological challenges that have been identified in the analysis of HRM and performance in large firms (see Guest, 2011). A significant limitation of the extant literature is a lack of methodological rigour to demonstrate that the positive relationship commonly found between human resources and performance is actually causal, in the sense that when formal human resource practices are instituted, they lead to higher performance (Wright et al., 2005). It is for this reason that the design of this study directly responds to Wright et al.'s call that:

> Future research should focus on study designs that are better able to demonstrate causal order to show that human resource practices, when implemented correctly, can positively generate higher firm performance. At a minimum, this calls for focusing on gathering data at multiple points in time. (2005: 435)

In order to address this pivotal issue of causality, a sample of 336 UK SMEs were surveyed on the use of a selection of formal human resource practices which were applicable to 90 percent or more of their employees in two time periods, 2007 and 2011. In addition, subjective measures of performance were obtained for these two time periods for this sample.

Specifically, placed within the theoretical framework of the resource-based view (RBV) of the firm, this article examines whether there is a relationship between the use of a selection of formal human resource practices and the performance of SMEs and explores the causal order of any

relationship found. The performance of firms is studied through profitability, innovation and labour turnover. By analysing whether the selected human resource practices assessed at one point in time are related to subsequent SME performance – and thereby providing a rare 'predictive' method – the article makes an important contribution to both the SME and HRM literatures, and the emerging discourse between these two literatures and fields of practice.

The article is structured as follows. The first section provides an overview of the relevant literatures. The research hypotheses are then formulated. Subsequently, the sample, measures and estimation methods are discussed. The results are then presented. The article concludes with the implications of the study's findings for practice, reflection upon the limitations of the study, which are linked to opportunities for future research, and final remarks.

Literature review and hypotheses

The resource-based view of the firm

In order for firms to sustain competitive advantage, they must acquire and utilise valuable, scarce and inimitable resources (Barney, 1991). RBV emphasises the internal characteristics of the firm: in particular, its ability to develop distinct resources and capabilities which are difficult to imitate and substitute, and so will enhance its ability to adapt to a continuously and rapidly changing environment. In contrast with other resources that are easier to imitate, the management of human resources is complex, ambiguous and dynamic, and thus a potential source of significant competitive advantage (Barney and Wright, 1998; Becker and Huselid, 1998). Moreover, the inimitability of HRM practices is linked to path dependency (Collis and Montgomery, 1995), which introduces a dynamic and temporal dimension into an analysis of HRM within an RBV framework.

The unique historical conditions within each firm make it difficult for competitors to obtain the same level and quality of human capital (where human capital refers to the knowledge, skills and abilities embedded within a firm's human resources that are the direct result of learning, education and training; Becker, 1964), or to replicate the same human resource practices and systems. Temporally, even when competitors realise that human resource systems produce value, they cannot replicate them immediately, especially in the resource constrained environments common within SMEs (Becker and Gerhart, 1996; Dierickx and Cool, 1989; Razouk, 2011).

Unsurprisingly, human resources is regarded as a pivotal input to the resource base of the firm (Barney and Wright, 1998; Becker and Huselid, 1998; Huselid, 1995; Wright et al., 2001). However, debate continues over how the management of human resources contributes to sustained competitive advantage. It has been suggested that the source of competitive advantage lies primarily in the human resources themselves, and not in the practices used to recruit, utilise or retain them (Ferligoj et al., 1997). In contrast, others argue that HRM practices themselves can be viewed as organisational competencies, especially their ability to influence employee behaviours: for example, the ability to motivate and generate loyalty (Barney, 1997; Narasimha, 2000; Oinas and Van Gils, 2001). Either interpretation suggests that human resources are important contributors to the success of the firm, and that the use of a greater number of human resource practices is likely to be associated with better firm performance.

The RBV framework implies that human resources may be of even greater significance for smaller firms, since they often have to do more with fewer resources in order to remain competitive. In addition, the effect of HRM decisions is likely to differ in such firms compared to larger organisations, as each policy and decision regarding human resources is likely to be amplified. Issues of person–organisation fit become particularly important, as new employees need to adopt shared team mental models (Heneman et al., 2000), often requiring team members to play

multiple roles in the organisation; present a consistent face to customers and other stakeholders; and display extra-role behaviours, including a high degree of flexibility (Messersmith and Guthrie, 2010). Moreover, the management of human resources is likely to be administered very differently in smaller firms than larger firms. Often, the responsibility will fall on the organisation's executives and individual managers. This has the potential to lead to greater vertical integration between firm strategy and human resource practices. However, it may result in the neglect or mismanagement of this important resource, arising from the fact that entrepreneurs and small business owners have so many competing demands for their time and may lack experience in employee management. Indeed, given that often, employment practices have been found to be low on the priority list of smaller firms (Cassell et al., 2002), it is important to establish whether a more formal approach to managing human resources – through the use of a greater number of formal human resources practices – affects the performance of such firms. Certainly, evidence from large firms suggests that a link between the use of more human resource practices and organisational performance is a positive one (Guest, 2011).

It is also important to emphasise that in the smaller firm context, whether human resource practices are 'formal' or 'informal' should be carefully considered. As such, the demarcation between formality and informality should not be viewed as strictly dichotomous, but rather as a continuum (see Ram and Edwards, 2003). Formality and informality is likely to be dynamic, reflecting both internal and external contingency factors. This view is echoed by Ram et al.:

> The nature of 'informality' in small firms should not, therefore, be taken at face value. Too often it is accepted as an inevitable product of entrepreneurism and close interpersonal relations in the workplace, promoting individualised and *ad hoc* patterns of decision-making and behaviour ... There is real scope for management choice, but within certain limits and as circumstances change the nature and extent of informality adapts. (2001: 859)

Moreover, in the context of the UK and the EU generally, the regulatory environment is likely to have had a significant influence on SME' use of formal human resource practices. In the UK, the external environment changed considerably in relation to the regulation of the labour market during the 13 years of Labour governments. For example, the number of cases accepted to proceed to employment tribunals increased significantly, even during the time span of this study, by 43 percent (266,500 in 2008–2009 to 382,400 in 2010–2011; Ministry of Justice, 2011). It is within this type of environment that UK SMEs operated during the two survey periods, and it is argued that this fundamentally affected the use of more formal human resource practices. This issue is returned to again in the discussion of the selection of formal human resource practices.

Human resource management and performance

Early research on the HRM–performance relationship suggested that the adoption of 'best practice' human resources may have a universal positive effect on the performance of firms. A set of best practice was sought, which could be applied more or less universally across firms (Delaney and Huselid, 1996; Delery and Doty, 1996). In effect, this analysis implied that the positive effects of different best practices were additive: that the more such practices are used, the better the performance (Becker and Gerhart, 1996). The terminology used in this early literature has evolved subsequently to encompass the broad term 'high-performance work systems': often a term that is used without a clear explanation of what practices comprise such systems

(e.g. Razouk, 2011). Nevertheless, there is a general emphasis in the human resources–performance literature on analysing 'high performance' or 'high commitment', as opposed to traditional practices (Guest and Conway, 2011). In contrast, the contingency approach posits that the relationship between performance and HRM is conditional upon the different modalities taken by another variable, viewed as contingent. The strategy pursued by an organisation is considered to be a pivotal contingency factor (Delery and Doty, 1996; Youndt et al., 1996). A further approach, the configurational, combines the best practice or universal and contingent approaches to the HRM–performance relationship, and examines how a range of independent variables are related to performance (the dependent variable). In particular, this approach allows scope for external or vertical fit between HRM practices and business strategy, but also for internal fit or horizontal fit between practices.

Research on HRM in SMEs has been evolving in the past decade: a focus upon the HRM–performance debate in the context of SMEs is emerging but such investigations are challenging, given the high incidence of informal HRM (see for example, Cardon and Stevens, 2004), and the coexistence of formal and informal HRM practices (Martin et al., 2008). In order to establish whether there is a relationship between human resource practices and performance, especially in any type of large survey, researchers must ask respondents whether a particular policy is in place. In the context of SMEs, questions are prefaced generally with whether the policy is 'formal' and/or 'written' (Michie and Sheehan, 2008; Nguyen and Bryant, 2004). However, this approach is unlikely to capture the important role of informal HRM in SMEs.

A further issue complicating analyses of the HRM–performance relationship is the potential for the difference between rhetoric and reality regarding policy presence and implementation (Legge, 2005). Specifically, a human resource practice may formally be in place, but it may be delivered only sparingly, especially when delivery has been devolved to line managers and/or is not consistently applied to all employees (Legge, 2005; Bowen and Ostroff, 2004; Guest and Conway, 2011). In the small firm context, given the importance of informal practices, any survey about whether a formal practice is in place or not has the potential to underestimate, and possibly misrepresent, the extent to which human resources are managed in practice, since the use and effectiveness of informal management will not be captured in a survey.

In terms of the actual management of human resources, Marlow (2002) found that respondents often had formal written policies – in filing cabinets, utilised when problems arose – but that owners preferred to maintain their own idiosyncratic approaches to managing the employment relationship, and rarely consulted or used formal procedures. Similarly, Marlow and Thompson found that formal policies were in place for key employment issues, but report that 'there were clear differences apparent in the manner and extent to which these policies were embedded into practice' (2008: 238). These studies suggest that great care must be given to the interpretation of findings about formal human resource practices in the SME context. Moreover, quantitative studies of labour management in smaller firms (Bacon et al., 1996; Gilman et al., 2002; Marlow, 2002) have found a degree of 'over-claiming' and 'mock formality' in the use of formal policy and practice, thereby providing another potential source of overestimating the extent of formal human resources in SMEs (see Marlow and Thompson, 2008 for a detailed discussion). Thus, caveats must be used when interpreting any findings about the relationship between formal human resource practices and performance in SMEs, especially when the data have been generated by surveys, as the potential exists for both overestimation and underestimation of the role of human resources in SMEs.

In terms of the extant literature on the human resources–performance relationship in SMEs, the impact of training and performance has been investigated most frequently, and generally a positive

association with performance is found (de Kok, 2002; Patton and Marlow, 2002; Storey, 2004; Storey and Westhead, 1997). Nguyen and Bryant (2004) found a positive relationship between the use of formal human resource practices and firm size; moreover, formal human resource practice is positively associated with the owner's perception of firm performance. More recently, and drawing upon RBV in independently owned firms less than 10 years old and with more than 10 employees, Messersmith and Guthrie (2010) found that utilising high-performance work systems was positively associated with sales growth and innovation. Patel and Cardon (2010) examined the role of adopting HRM practices on labour productivity in SMEs that face high levels of product–market competition. They found that group culture strengthens a firm's propensity to adopt HRM practices and increases the effect of HRM practices on labour productivity; however, in firms where there was minimal product–market competition, limited benefit was derived from the adoption of human resource practices. Perhaps of even greater importance, they found that when SMEs were faced with high levels of product–market competition – absent group culture – they were not likely to adopt many HRM practices, neither was adopting such practices found to enhance labour productivity significantly. This study demonstrates the importance of contingency – internal, in relation to group culture, and external, in relation to product market competition – in the analysis of HRM and performance in SMEs.

In a sample of 119 young high-technology firms, Messersmith and Wales (2011) found that the relationship between entrepreneurial orientation and firm growth was not statistically significant. However, combining high-performance work systems or a partnership philosophy with entrepreneurial orientation was positively associated with higher levels of growth. This study also highlighted the importance of contingency – here, internal contingency – in that the potential for entrepreneurial orientation to enhance growth in young firms depends on the extent to which these organisations utilise certain human resource practices.

Utilising a multi-respondent approach of interviews with chief executive officers (CEOs) and employees, Verreynne et al. (2011) found a positive association between better performance and high-performance work systems: trust, teamwork, participation, organisational learning orientation and employee skill development, performance systems and high commitment were of particular importance. From the employees' perspective, the link between better performance and high-performance work systems was particularly acute for engagement, participation and organisational support. Informality was a common thread which, the authors found, facilitated the interaction between employees and high-performance work systems – especially employee participation – and contributed to a positive organisational culture, which in turn enhanced performance. These important findings, particularly in relation to the role of informality, reflects the advantage of their study's methodology (multi-respondent case studies), which contrasts with the more common single-respondent survey-type method commonly used in these recent articles.

Based on the RBV of the firm and the considerable empirical evidence outlined, the present study's first hypothesis, set within a cross-sectional context, is as follows:

H1: There will be a positive association between the number of selected formal human resource practices (at time 1) and reported firm performance (at time 1).

A significant limitation of the empirical evidence to date on the relationship between HRM and performance, including within SMEs, is that the studies are cross-sectional, and therefore do not allow inferences about causality to be drawn. It is to this pivotal issue that this article now turns.2

Causal order between human resource management practices and firm performance

A better understanding of the interaction between HRM and performance and particularly, the search for conclusive evidence of the decisive impact of the former on the latter, has been referred to as the human resources' 'Holy Grail' (Boselie et al., 2005). An ability to establish causal order in the HRM–performance relationship is a necessary, albeit insufficient, step in the development of conclusive evidence about the relationship. While the extant research suggests a positive relationship between human resources and performance (see Boselie et al., 2005 and Combs et al., 2006 for comprehensive reviews), both of these reviews concluded that there was insufficient evidence to explain why there was an association, reflecting to a large extent the inability of previous research to establish causal order. Indeed, as Wright et al. (2005) document, causality has received insufficient attention in the prior literature. In order to establish causal order, the design of the research must be 'predictive', rather than 'post-predictive' (the most prevalent design within the literature), 'retrospective' or 'contemporaneous' (for a detailed discussion, see Wright et al., 2005).

A predictive study requires collection of data in at least two time periods, and thereby must be longitudinal rather than cross-sectional in design. Utilising a rare predictive approach and explicitly testing for causal order, Guest et al. (2003) related human resource practices to both past and subsequent objective productivity and profitability data, as well as current subjective productivity and financial performance estimates among a sample of 366 companies in the UK. They found a positive association between HRM and performance, but significantly, the study failed to demonstrate that human resource *causes* higher performance. Wright et al.'s (2005) predictive study, which also tested for causal order, found a drastic reduction to non-significance of the effects on human resource on performance, once past performance had been controlled for, thereby echoing Guest et al.'s (2003) findings.

Given the scarcity of resources in most SMEs, which will affect their ability to invest in human resources, it is essential that this causation issue is addressed in any analysis of human resources and performance. The only study to date which has examined the issue of causal order in the HRM–performance relationship (specifically, a predictive study), was conducted by Razouk (2011) on a sample of 275 French SMEs. Significant simultaneous ('contemporaneous') and longitudinal correlations between high-performance work systems (the focus of the study) and all of the performance indicators examined (profitability, innovation and social climate) were found, Most importantly, in terms of the causal order debate, controlling for past performance did not eliminate the correlation of high-performance work systems with future performance. The implications of this study for SMEs are potentially quite profound: investing in formal human resource and/or high-performance work systems was found to positively affect (contribute to) an increase in performance.

Thus, there appears to be a dichotomy in the literature regarding the analysis of causal order in HRM–performance research, between large organisations and SMEs. The RBV of the firm provides some insight into why this pattern has been found. The contrasting findings about causal order may reflect more careful scrutiny about SMEs' decisions to introduce formal human resource practices, compared to larger organisations which have more resources. For large organisations it would be standard to have formal practices, although they would not necessarily be linked with efficiency (rather, practices may be in place for 'legitimacy' reasons; see Collings and Dick, 2011 for a recent discussion in the context of multinational corporations). In contrast, in SMEs, before a formal practice is introduced, there are likely to be at least some implicit (if not explicit) calculations about the possible returns associated with the implementation of formal practices. In addition,

some investment in formal human resources may be driven by what SME owners view as potentially 'preventative costs' – that is, practices such as job descriptions and formal performance management reviews – the presence of which may reduce the probability of employment tribunals (see for example, Marlow and Thompson, 2008).

The study's remaining hypotheses are derived from the importance of conducting an intertemporal analysis of any HRM–performance relationship found. If there is a positive association between selected formal human resource practices in period 1 (H1), the returns to human resources should continue to contribute to the firm's performance in period 2, as the investment is effectively amortised and returns realised. Therefore, the second hypothesis states:

H2: There will be a positive association between the number of selected formal human resource practices (at time 1) and reported firm performance (at time 2).

Given the importance of testing for causal order outlined previously, the final hypothesis posits:

H3: The positive association between the number of selected formal human resource practices and reported firm performance (at time 2) will be sustained after controlling for previous performance (at time 1).

If H3 is not rejected, this implies that human resource practices in an earlier period (time 1) positively contribute to sustained competitive advantage in SMEs. Therefore, the testing of this hypothesis is important for both the HRM and SME literatures.

Method

Sample and data collection

The data used in the analysis were derived from a random, stratified sample of firms from the Dun and Bradstreet databases in the UK. Four dimensions were used to stratify the sample: organisational size; age; the primary sector of business activity; and independent ownership (i.e. not being part of another, usually larger, organisation). In relation to size, the selection criterion was that the firms employ between 10 and 249 employees (consistent with the EU's 2005 definition of SMEs). For age, the selection criteria were that the firm was at least 18 months old, so that initial, often idiosyncratic start-up issues were not captured.

Statisticians at the then Department for Business, Enterprise and Regulatory Reform assisted with interfacing between the Dun & Bradstreet data and the Annual Business Inquiry survey, and advised on the selection of industries based on their relative contribution to employment in SMEs in the UK in the initial sample period (2007). Using the 1992 UK Standard Industrial Classification (SIC) codes, in total nine industries – four in manufacturing and five in services –were included in the analysis.

Given that the firms employed fewer than 250 people, it was unlikely that they would have a human resource department or human resource director or specialist, so letters and emails were sent to the company's CEO, owner or managing director – the most senior person that could be identified from the Dun & Bradstreet database. Contact details were checked by a Google search, as the information there was often found to be more current than that in the Dun & Bradstreet databases. Due to low responses to postal surveys, in particular for SMEs (Dennis, 2003), telephone surveys were conducted with the selected companies. A professional survey company,

working in close collaboration with the primary researcher, conducted the structured interviews, which lasted approximately 30 minutes, in both time periods. Confidentiality was emphasised exhaustively. The 2007 surveys were piloted first by the primary researcher through personal contacts with 10 SME owners, and then by the survey company (six additional firms). This information, which was used to refine the survey instrument, was particularly important in relation to the selection of formal human resource practices utilised in the final survey (see below for further detail and Appendix 1 for additional details pertaining to the telephone interviews).

Study response rates

Response rates are as follows (see Table 1): 26.5 percent in 2007 and 24.7 percent in 2011. Owing to the difficulty in obtaining panel data, a high target response rate of 25 percent was set in both periods. Participants in the 2007 survey were asked if they would agree to be re-surveyed at a future date, and these participants were prioritised in the 2011 survey.[3] All participants in both periods were sent an executive summary of the findings, including industry or sector-specific recommendations, which they found very helpful and contributed to their willingness to participate in the 2011 survey. Moreover, participants in both periods were offered 20-minute 'telephone surgeries' at no cost, conducted by the primary researcher and her team, to discuss the study's findings and in particular recommendations on how to improve the management of human resources within their firms (see Appendix 1 for additional detail). These methods also helped to increase repeat participation in period 2 (2011). A total of 336 firms participated in both surveys (21.1% of the 1589 firms that participated in the 2007 survey). In 78.3 percent (263) of firms, the same person completed the survey in both time periods. It is this longitudinal data that are analysed in this article.

Utilising the Dun & Bradstreet database, response bias was assessed by examining differences in net sales, employee levels and firm age between responding and non-responding firms in 2007 and 2011, and between firms where the respondent had changed over the two periods. A two-stage Heckman Test was used to test for response bias, including comparing these measures in the firms where the survey was not completed by the same respondent in both time periods. The only statistically significant response bias found was for firms that employed fewer than 25 people: these were statistically significantly less likely to participate in either survey at the 0.05 percent level.

Measures

Human resource practices. In order to place this study in the broader human resource–performance literature, the selected practices are ones that are commonly included in the extant literature, particularly that which examines high-performance work systems.[4] Moreover, in order to examine whether the well-evidenced positive relationship between human resources and performance is found in the SME context, focus is given to formal human resource practices, and thereby the potentially significant role of informal practices could not be captured.[5]

The selection of practices covered six main areas of HRM (see Appendix 2, Table 7 for detail):

1. recruitment and selection;
2. performance appraisal;
3. performance-based compensation pay;
4. training and development;
5. employee voice, consultation, participation and information sharing;
6. strategic people management.

Table 1. Samples and study response rates.

	2007 survey (1)	2011 survey (2)	Panel, 2007 and 2011 (3)
Sample	5998	6165	–
Response (*n*)	1589	1522	336
Response rate (%)	26.5%	24.7%	21.1% (out of 1589)

The selected practices were modified based on the pilot interviews to reflect, in part, the context of SMEs. In particular, two practices commonly used in the human resource–performance literature, job security and harmonisation, were not found to be applicable to the vast majority of the pilot firms.

HRM was measured through 17 items in the interview schedule. Although the respondents were not directly asked about their motivation for introducing formal human resource practices, the vast majority of respondents (77.6%) made at least one reference during the interview to worries about being taken to an employment tribunal. This concern was linked to decisions to introduce more formal human resource practices, for example:

- to advertise jobs and use formal recruitment methods;
- to formally document potential 'problem, underperforming employees', which prompted the introduction of performance appraisals to try to avoid unfair dismissal cases;
- equal opportunities cases, which appeared to have contributed to the introduction of performance appraisals and performance-based compensation;
- the decision to seek Investor in People status and/or to hire a professionally qualified human resource specialist; and/or
- an inability to keep track with frequently changing employment legislation.

Thus, within this context, it is perhaps not surprising that the use of formal human resource practices – even if used in a preventative or reactive context (i.e. to try and minimise being taken to an employment tribunal, or once a case has been filed) – is quite common in UK SMEs and perhaps higher than previously expected.6 The 2004 Workplace Employment Relations Survey also found evidence that SMEs in the UK were utilising formal human resource practices to a much greater extent than previously reported (see Forth et al., 2006 for a detailed discussion).

In order to ensure that the human resource practices measured were widely dispersed within the organisation – that the particular practice was applied extensively among the firm's employees – it was decided to use Guest et al.'s (2003) demanding cut-off point, whereby the item was counted if it applied to 90 percent of the workforce. Thus, for each of the non-dichotomous variables, the average number of specific items applying to the majority (90% or more) of the core workforce was counted. For dichotomous items, the score was computed as a straight count of the number of items that applied to the whole workforce. A score was calculated for each of the two human resource indices in 2007 and 2011 (Sun et al., 2007; Wright et al., 2005). The score of a firm indicates how extensively the 17 indicators of human resource practices are used. Scores were standardised within the six areas, since the number of items describing the areas varied. Cronbach's alpha for the HRM index in 2007 and 2011 were 0.78 and 0.81 respectively.

Performance. Consistent with the literature, a multidimensional measurement of performance was used (Dyer and Reeves, 1995; Paauwe, 2009; Wright et al., 2005). The three indicators were financial performance, innovation and labour turnover. During piloting, companies were asked about actual

objective performance. The vast majority of respondents declined to provide this data, yet were willing to provide subjective measures. Thus, the latter were collected in both survey periods.

The performance questions followed a format similar to that in the Workplace Employee Relations Survey (Forth et al., 2006), and were worded as follows:

> Here I would like your opinions on how your company is performing. Firstly, can you compare your company's performance over the past three years to that of close competitors in your industry/sector, for the following two measures:
>
> (a) financial performance; and
> (b) innovation (innovation is defined here as product and process innovation, as well as organisational and marketing innovation.
>
> (Please only include new or significantly improved goods or services or the implementation of new or significantly improved processes, logistics or distribution methods).
>
> Please rate your performance on a scale of 1 to 5, where 1 = very much worse and 5 = very much better.

Specific ranges on labour turnover were obtained. These were coded as follows: 0–4.9 percent (0); 5–14.9 percent (1); 15–50 percent (2); and over 50.1 percent (3) (see Guest et al., 2003). The question on innovation reflects the recognised importance of this notion for sustained competitive advantage (Herrera and Sánchez-González, 2012). The definition of innovation used followed that of the EU's Community Innovation Survey (Parvan, 2007).

The validity of perceptual indicators has been found by many researchers: in particular, Wall et al.'s (2004) detailed comparative analysis from several studies between subjective and objective measures of performance found significant correlations between the types of two performance measures (see also Dess and Robinson, 1984). However, in a more recent survey article, Forth and McNabb (2008) concluded: 'the main conclusion is that subjective and objective measures of performance are weakly equivalent but that differences are also evident' (2008: 104). Thus, given concern about the potential reliability of subjective performance measures, several steps were taken to determine the validity and reliability of the self-report data used in this analysis. Interclass correlation coefficients (ICC) were examined between the self-report measures and those in the Dun & Bradstreet database, and where these were not available for the sample companies, reports from Companies House were utilised.7 ICC values are a rating of the ratio of between-rating variance to total variance (Shrout and Fleiss, 1979). In this case, ICC(1) values were created to assess the degree of agreement between the self-report measures and the archival Dun & Bradstreet and Companies House data (profit per employee and total employment data were analysed). An ICC(1) estimate is the proportion of variance in a measure explained by group membership (Bryk and Raudenbush, 1992; Datta et al., 2005). In this analysis, the 'group' is identified as being the same firm. Typically, when the ICC(1) value is large, a rating from a single source is likely to provide a relatively reliable estimate; however, when ICC(1) is small, multiple responses from an organisation are necessary to establish reliable estimates (Bliese, 2000; Datta et al., 2005).

The results of this analysis demonstrate a high degree of consistency between the self-report measures (financial performance and employment) and the Dun & Bradstreet and Companies House data in both time periods for profit per employee (ICC[1] in time 1 = 0.508; and ICC[1] in time 2 = 0.519) and number of employees (ICC[1] = 0.735; and ICC[1] in time 2 = 0.762). While there is no common standard for acceptable ICC(1) values, a value greater than 0.20 is generally considered to be reliable (Ostroff and Schmitt, 1993). Thus, both of these items in both time periods would be considered large and indicate reliability (Bliese, 2000).

The potential presence of common method bias was examined using Harman's Single Factor Test, which was conducted by loading each of the study variables (24 in each time period) into an exploratory factor analysis.8 The test resulted in 21 and 22 factors in time 1 and time 2 respectively, with an eigenvalue exceeding 1.0, and explained 95.2 and 95.8 of the cumulative variance in the two time periods, respectively. This test provided evidence that common method bias was not likely to be substantial (Podsakoff and Organ, 1986). However, there is no consensus on how many factors should emerge from the analysis (when only one factor emerges is it quite possible that common method bias accounts for most of the relationships), and as the number of variables increases, more factors are likely to emerge; thus the potential for common method bias cannot be ruled out completely.

Other recent studies on performance in SMEs that conduct similar tests also find evidence of the reliability of single-respondent data (see for example, Messersmith and Guthrie, 2010; Messersmith and Wales, 2011). This may reflect that, unlike a respondent from a large firm who is ultimately accountable to multiple internal and external stakeholders, the majority of respondents in SMEs were the CEOs, owners or managing directors, and thus highly accountable to themselves – thereby potentially reducing the potential for common method bias.

Control variables

While the RBV of the firm is the primary theoretical framework within which this study is placed, the relationship between HRM and the external environment and to organisational strategy – a contingency framework – is used also to inform the selection of key control variables. The importance of context, especially for small firms, is emphasised in the literature (see in particular, de Kok and Uhlaner, 2001; see also Jackson and Schuler, 1995), and helps to inform the selection of the control variables used in this study. The control variables used here are as follows: firm size and age (both variables are related and are found to be important for the use of HRM in both large and small firms, reflecting the potential impact of economies of scale and experience; Nguyen and Bryant, 2004; Rutherford et al., 2003); whether the firm operated in the manufacturing or service sector; and whether the firm primarily pursued a 'quality and/or innovator' or cost-based strategy.

The relationship between HRM and performance is estimated by ordered logit analysis. The *B* (regression coefficient) and the odds ratio have been retained to interpret the results. The odds ratio indicates the probability that an event arises, and the probability that it does not (*P*/1-*P*). Odds ratios measure the association between the human resource index and performance. The closer it is to 1, the greater the link between the use of human resource practices and performance. The odds ratio is also equal with the exponential of *B(e*B*)*.

Results

A significant part of the analysis focuses on causal order: in particular, the potential for reverse causality between the human resource index and the three performance indicators. The method used here was influenced by Guest et al. (2003) and Wright et al. (2005), who propose a method that is divided into three successive steps. First, the identification of a simultaneous association is made between the HRM index and the performance measures in 2007 (time 1). Second, a longitudinal analysis is tested, made possible by the temporal gap. This step determined whether the simultaneous associations were sustainable over time, and provided insight into temporal precedence. Temporal precedence implies that the proposed cause must exist in the time prior (the use

of a greater number of the selected human resource practices in 2007) to the proposed outcome (estimates of performance in 2011) (see Cook and Campbell, 1979 and Wright et al., 2005 for more detail). Third, previous performance is controlled for in the estimations. Therefore, this approach takes into account the possibility that prior performance may explain the adoption of human resource practices (i.e. reverse causality).

Table 2 shows the correlation analysis. This initial analysis of the key study variables shows that all of the firm performance indicators in 2007 and 2011 were significantly associated with the human resource index. None of the Variance Inflation Factors were above 2.4, indicating that multicollinearity is not problematic with these data (Hair et al., 2006).

Relationship between human resource management and performance: simultaneous associations

H1 proposed a relationship between HRM and performance at time 1. The results (see Table 3) show that the human resource index is significantly positively related to profitability and innovation, both at the $p<0.01$ level; and significantly negatively related to labour turnover at the $p<0.05$ level. The odds ratios for the three measures were 1.28, 1.41 and -1.39, indicating increases by 28 and 41 percent for profitability and innovation and a decline of 39 percent for labour turnover, when the human resource index increases by unity.9 Thus, H1 is not rejected, indicating that there is indeed a positive simultaneous association between the use of the selected human resource practices and the three performance measures. Whether these relationships are sustainable over time is now examined.

Relationship between human resource management and performance: longitudinal associations

Table 4 shows the results for H2, indicating that significant simultaneous associations persist after introduction of the temporal shift. The significance level for profitability declines to $p<0.05$ but remains at the $p<0.01$ level for innovation, and increases to $p<0.01$ for labour turnover. An increase of unity of the human resource index implies an increase by 20 and 35 percent in the odds ratio for profitability and innovation, and a 42 percent reduction in labour turnover. Thus H2 is not rejected, thereby implying that investment in the selected human resource in 2007 continues to have a positive effect on performance in 2011.

Causal order

H3 posited that any positive relationship between human resource practices and SMEs' performance found at time 2 will be sustained when previous performance is controlled for in the estimations. Table 5 shows the significant and positive link between human resource and profitability and innovation, and that the significant and negative link between human resource and labour turnover at time 2 persists in spite of the control of the performance variables at time 1. That is, the relationships remain significant in 2011, even after controlling for performance in 2007. It should be noted that the strength of the human resource–performance relationship did weaken once previous performance was controlled for in the estimations (Huselid and Becker, 1996 also report this when controlling for previous performance) – this is likely to reflect that better performing firms are able and/or more likely to invest in the selected human resource practices – but crucially, the relationships remain significant. So, the results suggest that increased use of the selected human resource

Table 2. Means, standard deviations and correlations among main study variables.

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Size	38.10	26.44											
2. Age	26.43	30.15	0.25										
3. Industry (services)	0.61	0.19	–0.15	–0.19									
4. Strategy	0.47	0.45	0.24	0.20	0.23								
5. HRM 2007 index	9.36	3.23	0.31	0.25	0.19	0.47							
6. HRM 2011 index	11.60	3.09	0.32	0.28	0.21	0.51	0.68						
7. Financial performance, 2007	3.45	0.76	0.42	0.33	0.16	0.38	0.57	0.62					
8. Innovation, 2007	2.87	0.47	0.31	0.22	0.24	0.67	0.42	0.61	0.28				
9. Labour turnover, 2007	1.19	0.78	0.23	0.21	–0.23	–0.27	–0.48	–0.45	–0.09	–0.16			
10. Financial performance, 2011	3.14	0.82	0.40	0.35	0.12	0.45	0.51	0.52	0.62	0.68	0.15		
11. Innovation, 2011	3.20	0.62	0.28	0.27	0.09	0.71	0.39	0.57	0.56	0.71	0.19	0.48	
12. Labour turnover, 2011	0.92	0.64	0.19	0.16	–0.25	–0.28	–0.40	–0.39	–0.07	–0.12	0.27	–0.22	–0.10

Note: For correlations >0.13, $p<0.05$; correlations >0.17, $p<0.10$; correlations >0.21, $p<0.001$.

Table 3. Simultaneous results, H1.

Determinants	Financial Performance, 2007		Innovation, 2007		Labour Turnover, 2007	
	B	*Odds ratio*	*B*	*Odds ratio*	*B*	*Odds ratio*
Control variables:						
Log (size)	0.25***	1.23	0.18**	1.17	0.20**	1.11
Log (age)	0.11	1.02	0.14	1.02	0.16	0.98
Industry (manufacturing)	0.09	0.94	0.11	1.19	–0.13	0.91
Strategy (growth/ innovation objective focus)	0.23**	1.34	0.31***	1.22	–0.12	–1.06
Human resource index, 2007	0.29***	1.28	0.46***	1.41	–0.20**	–1.39
Adjusted R^2	0.16		0.19		0.15	
Log likelihood	–123.67***		–146.78***		–127.84***	

Note: ***significant at 1%; ** significant at 5%; and *significant at 10% in all models.

Table 4. Longitudinal results, H2.

Determinants	Financial performance, 2011	Odds ratio	Innovation, 2011	Odds ratio	Labour turnover, 2011	Odds ratio
	B		B		B	
Control variables:						
Log (size)	0.21**	1.25	0.20**	1.20	0.21**	1.14
Log (age)	0.10	1.03	0.15	1.01	0.15	0.99
Industry (manufacturing)	0.11	0.93	0.10	1.17	–0.12	0.91
Strategy (growth/ innovation objective focus)	0.22**	1.25	0.30***	1.38	–0.11	–1.05
Human resource index, 2007	0.24**	1.20	0.30***	1.35	–0.29***	–1.42
Adjusted R^2	0.19		0.21		0.18	
Log likelihood	–128.26***		–167.10***		–133.19***	

Note: See Table 3.

Table 5. Reversed causality analysis, H3.

Determinants	Before-control coefficient		After-control coefficient	
	B2011	Odds ratio	B2011	Odds ratio
Financial performance	0.21**	1.26	1.18	0.18*
Innovation	0.34***	1.40	0.26**	–1.29
Labour turnover	–0.26***	–1.39	–0.20**	–1.31

Note: See Table 3.

practices is able to predict current and future performance measures, and is indeed a contributing *cause* of future performance. In other words, reverse causality is *not* found in the human resource–performance relationship for this sample of SMEs.

Discussion

Previously, a limited number of studies have found a positive relationship between a greater number of human resource practices and SME performance in both a cross-sectional context (Messersmith and Wales, 2011; Michie and Sheehan, 2008; Nguyen and Bryant, 2004; Verreynne et al., 2011) and longitudinally (Razouk, 2011). The purpose of this research was to contribute to this literature by examining whether there was a positive association between the use of a selection of human resource practices and the performance of UK SMEs, and whether there was a problem of reverse causality between these variables.

The RBV of the firm, contingent and configurational frameworks, informed the derivation of the study's three hypotheses. H1 examined whether the use of a greater number of the selected human resource practices (estimated by an increase in the value of the human resource index) influences current UK SME performance. H2 linked the influence of human resources with future SME performance; and finally in H3, the potential for reverse causality was tested.

The estimates show that the human resource index is positively and significantly linked to profitability and innovation; in terms of labour turnover, the relationship is negative and significant. Accordingly, these findings confirm H1, that a greater use of the selected human resource practices is associated with better 'current' (2007) performance. These findings are consistent with the cross-sectional analyses of Michie and Sheehan (2008) and Nguyen and Bryant (2004). The results of the longitudinal analysis show that those firms with a greater number of the selected human resource practices not only obtain better current performance, but are able to maintain better performance over time (H2). Most significantly, no evidence of reverse causality is found in the human resource–performance relationship (H3). The relationships remained significant even after controlling for previous performance. These findings are consistent with the longitudinal analysis of French SMEs reported by Razouk (2011). Therefore, these results are consistent with the RBV theory of the firm, which suggests that since a human resource system is complex and dynamic, it is likely to be an important source of sustained competitive advantage. As such, these findings offer an important empirical contribution to the theory of the firm literature. In addition, they heed the call made in the human resource literature for longitudinal studies to eliminate potential bias from simultaneity and speculation in the interpretation of the relationship between human resource and performance.

Conclusion

Implications for practice

The study has significant practical implications. The analysis has shown that there are significant positive returns in terms of increased profitability, innovation and lower labour turnover associated with human resource investment, including incrementally – as shown by the analysis of the odds ratios. For example, an increase of unity in the human resource index in the first time period (2007) is found to increase profitability and innovation by 20 and 35 percent respectively, and to reduce labour turnover by 42 percent in the subsequent time period examined (2011). Given the potentially high direct and indirect costs to SMEs associated with such investment, an examination is undertaken of which of the selected practices have the most positive association with performance, and whether

these have changed over time. This is of particular importance in terms of practical recommendations for SME owners, who are unlikely to be able to introduce all of the selected human resource practices simultaneously and/or apply them to 90 percent or more of their employees.

The disaggregated analysis (Table 6) demonstrates several important trends. First, consistent with the aggregate (human resource) index analysis, the contribution to performance of the selected human resource practices is found to increase over time. The six disaggregated HR practice groupingswere analysed for the three performance measures (thus, a total of 18 disaggregated practice groupings).In 2007, it was found that eight out of the 18 (44.4%) human resource interventions were positively and significantly associated with the performance measures: one in relation to financial performance; two in relation to innovation; and five in relation to labour turnover. In 2011, it was found that 13 out of the 18 (72.2%) human resource interventions were positively and significantly associated with performance: four in relation to financial performance and innovation (=eight); and five in relation to labour turnover. So, it appears that specific human resource interventions have become more important in relation to the performance of SMEs over time.

It is now worth examining which practices made the most significant contribution and to which performance measure. The 2011 analysis indicated that for financial performance, the following human resource practices were most important: compensation; training and development and strategic people management ($p<0.05$); and recruitment and selection ($p<0.10$). For innovation, the following practices were significant: training and development and strategic people management ($p<0.05$); and recruitment and selection and employee voice or consultation and information sharing ($p<0.10$). For labour turnover, the following practices were significant: recruitment and selection; performance appraisal; training development and strategic people management ($p<0.05$); and employee voice/consultation and information sharing ($p<0.10$). Perhaps the most important outcome of this analysis is the finding that strategic people management is significantly associated with all three performance measures, and that its contribution to SME performance has increased over time. It can be argued that this is evidence of an ever-increasing role of more formal human resources, at least in the UK context.

Despite the importance of individual practices, the results from Tables 3 to 5 show the value of introducing practices as bundles or holistically – as evidenced by the higher R^2 and log likelihood estimations when the practices are entered as an index rather than individually (Table 6). Thus MacDuffie's (1995) widely cited analysis of the importance of human resource bundles appears to apply to this sample of SMEs. Another important finding for practice is that of all of the human resource interventions across the measures, training and development is most significantly associated with performance measures. The association between training and development and financial performance was not statistically significant in 2007, but by 2011 the results were indeed significant (at the 0.05 level). This finding is consistent with the view that financial returns to training and development or human resource development interventions are only realised over time. Such interventions are also likely to affect the retention of labour; greater human resource interventions are associated significantly with lower labour turnover. This suggests that SMEs that utilise the selected human resource practices have a higher rate of labour retention, which in turn provides a larger pool of employees to benefit from future human resource interventions.

The possibility that the most successful companies use more human resources and consequently obtain better financial performance was also examined: does firm success in terms of better performance have a positive effect on propensity to invest in human resource practices (Hiltrop, 1999; Paauwe and Richardson, 1997)? The results from H3 counter this evidence of

Table 6. Relationship between diaggregated human resource practices and performance, 2007 and 2011.

Determinants	Financial performance, 2007		Financial performance, 20011		Innovation, 2007		Innovation, 2011		Labour Turnover, 2007		Labour Turnover, 2011	
	B	Odds ratio (1	B	Odds ratio (2)	B	Odds ratio (3)	B	Odds ratio (4)	B	Odds ratio (5)	B	Odds ratio (6)
Control variables:												
Log (size)	0.25***	1.23	0.21**	1.25	0.19**	1.18	0.20**	1.21	0.20**	1.12	0.22**	1.15
Log (age)	0.10	1.01	0.10	1.02	0.15	1.03	0.16	1.02	0.15	0.99	0.16	0.99
Industry (manufacturing)	0.09	0.93	0.10	0.94	0.11	1.20	0.11	1.16	–0.14	0.92	–0.13	– 0.92
Strategy (growth/ innovation objective focus)	0.24**	1.35	0.23**	1.24	0.30**	1.21	0.32***	1.39	–0.21**	1.39	–0.29***	–1.43
Human resource practices:												
Recruitment and selection	0.17	1.09	0.19*	1.13	0.15	1.08	0.19*	1.12	–0.22**	1.16	–0.21**	–1.15
Performance appraisal	0.12	1.05	0.13	1.06	0.10	1.01	0.13	1.15	–0.19*	1.17	–0.20**	– 1.13
Performance–based compensation	0.20*	1.22	0.21**	1.14	0.08	0.98	0.10	1.05	–0.11	1.08	–0.08	–0.94
Training and development	0.16	1.05	0.22**	1.15	0.19*	1.17	0.21**	1.22	0.19*	1.16	0.21**	–1.15
Employee–voice, consultation and information sharing	0.10	0.95	0.11	0.96	0.18*	1.16	0.19*	1.17	0.18*	1.15	0.18*	–1.16
Strategic people management	0.16	1.03	0.20**	1.20	0.14	1.11	0.21**	1.22	0.19*	1.16	0.23**	– 1.22
Adjusted R^2	0.13		0.16		0.15		0.18		0.14		0.16	
Log likelihood	–115.22*		–120.56**		–118.21**		–133.22***		–119.87**		–128.39**	

Note: ***significant at 1%; ** significant at 5%; and *significant at 10% in all models.

reverse causality, showing that a causal relation exists between human resource practices and performance. The direction of causality was able to be determined, since the control of performance in 2007 did not produce a breakdown of the human resource–performance relationship in the 2011 analysis. Thus, this study demonstrates that a greater investment in the selected human resource practices has a positive effect on subsequent performance. The implications of this finding for SME owners are significant.

Limitations of the study and recommendations for future research

While this study addresses a key methodological limitation in the HRM–performance literature, that of causal order, it does not address other key limitations in the HRM literature. Perhaps the most significant is the study's single-respondent design, which not only creates the potential for common method bias, but does not allow insight into the 'black box' problem – the how and why of the relationship between HRM and performance, which is not explored.[10] Another key limitation is the selection of human resource practices examined, as it is recognised that there is no consensus in the literature about which practices respondents should be asked (Guest, 2011). It is entirely possible that the findings will be sensitive to the selection of practices investigated.

The importance of informal human resources exacerbates this issue even further in the context of SMEs (Marlow and Thompson, 2008).[11] Reflecting in part the single-respondent nature of the study's design, important process issues of the effectiveness of human resources and the role of a strong human resource system could not be examined either (see Guest and Conway, 2011 for an analysis in the context of large firms). Khilji and Wang (2006) and Wright and Nishii (2006) have emphasised the importance of the effectiveness of human resource implementation, in particular the need to distinguish between intended and implemented practices. Given the evidence reported by Marlow and Thompson (2008) about this dichotomy in the SME context, it suggests that this issue may be of even greater magnitude in studies such as this one.

One way to begin to address these limitations is by theory development specific to the management of human resources in the small firm context. The social constructionist approach taken by Nolan and Garavan (2012) in their critical review of human resource development in small firms, provides a valuable framework in which to commence such theory building. In addition to theory building, careful design of future survey method studies or detailed case studies will be able to address these important issues. This analysis has demonstrated that careful study and survey design has the potential to address previous – although certainly not all – limitations found in the extant literature. Thus, this research also flags up important opportunities for future research on the HRM–performance relationship in SMEs, especially those that relate to obtaining a better understanding of the essential processes that contribute to the relationship examined here (see Sanders and Frenkel, 2011 for an overview of the process perspective in the large firm context). In addition, case studies should provide greater insight into the role of internal and external contingencies and their evolution over time on the relationships examined (e.g. Messersmith and Wales, 2011; Patel and Cardon, 2010).

Final remarks

This article contributes to the understanding of the role of human resources in the performance of SMEs. In particular, by using a predictive methodology and explicitly testing for causal order, it makes an important contribution to the HRM–performance literature generally. By examining the human resource–performance relationship longitudinally and testing for reverse causation, it is shown that investment in the selected human resource practices has significant positive effects on

performance. Since these relationships were maintained over time, human resource investment appears to be a key input for sustained competitive advantage in SMEs. Nevertheless, SME owners must invest carefully, as the short-run costs of investment in human resource will be significant. However, the medium to longer-term gains associated with this investment are demonstrated to have significant positive effects for sustained competitive advantage. Finally, it has been argued throughout the article that the use of formal human resource practices in the sample SMEs reflects, at least in part, responses to the way in which labour is regulated in the UK and EU. Whether such formality exists in less regulated labour markets, such as Canada and the USA and thus, whether a positive association between human resource practices as measured in this study and performance is found elsewhere, merits investigation.

Appendix 1: Details of the telephone surveys

Telephone interviews, utilising structured interviews, were used to generate the data. The selection of this method was based in part on the successful use of telephone interviews in previous HRM–performance research in SMEs (see for example, Michie and Sheehan, 2008; Patel and Cardon, 2010). (The survey is available from the author upon request.)

The following protocol was used.

1. The main contact person identified from the Dun & Bradstreet database was sent a one-page briefing of the survey objectives and the expected length of the interview (around 30 minutes) was indicated. This was sent by both post and email (provided by Dun & Bradstreet; the names, addresses and emails were checked by Google searches). The initial cover letter indicated that all interview participants would be entered into a raffle draw for a *Sunday Times* wine case and a £100 Marks & Spencer gift certificate. Each participant would receive an executive summary of the study's practical implications for SMEs.
2. The selected person was contacted to enquire if they would agree to the telephone interview and, if affirmative, a date and time for the interview was set.
3. To ensure that the respondent understood the survey's terminology they were sent a glossary of definitions of the selected human resource practices, and examples of how they may be implemented in the SME context – which was sent before the telephone interviews were conducted.
4. A professional telephone interview company, which the primary researcher had worked with successfully in previous studies, was employed to conduct the interviews. The primary investigator met with the team selected to conduct the interviews, and briefed them on the study``s aims and objectives, answering any questions about terms, wording of the survey questions, etc. She also listened and advised during the pilot interviews undertaken – six in 2007 and five in 2011. Survey questions were revised in both time periods, based on these pilot interviews.
5. To generate a longitudinal sample, all firms that participated in the 2007 survey were sent the executive summary as promised, and were offered 20 minute free 'telephone surgeries' with members of the research team, including the primary researcher. Of the 2007 firms, 117 availed themselves of this service. Of these, 91.2 percent (107) participated in the 2011 survey (approximately 31.8% of the panel, $n = 336$).

Appendix 2

Table 7. Human resource practices used by sample firms and descriptions of performance measures, 2007 and 2011.

Explanatory variables: selected human resource practices	2007	2011
A. Recruitment and selection:		
a. Use of at least one of the following formal recruitment channels (JobCentre/employment service office; careers service; private employment agency)	0.537	0.596
b. Use of at least one of the following selection methods: formal application form; formal interview; work sample; test of job skills; assessment of job skills	0.878	0.935
B. Performance appraisal:		
Formal appraisal of majority of core employees at least annually	0.587	0.672
C. Performance-based compensation:		
a. Any performance-linked pay (merit pay or payment by results)	0.356	0.402
b. Employee share ownership schemes	0.022	0.045
c. Profit-related pay	0.192	0.252
D. Training and development:		
a. Formal induction programme for new core employees	0.912	0.921
b. The majority of core employees received formal (off-the-job) training in the past 12 months	0.586	0.634
c. The majority of core employees received informal (on-the-job) training in the past 12 months	0.783	0.842
E. Employee voice, consultation and participation and information sharing:		
a. Standalone non-union representative	0.078	0.062
b. Joint consultative committees or some type of structured consultation process	0.102	0.114
c. Employees are formally surveyed on a regular basis, at least annually, about issues timely to the organization	0.188	0.215
e. Regular information sharing (about investment plans, financial position and/or staffing plans)	0.267	0.223
F. Strategic people management:		
a. Job title denoting specialisation in employment relations/human resources	0.055	0.078
b. Formal strategic plan	0.356	0.429
c. Employment relations issues covered in plan	0.315	0.412
d. Investor in People status	0.157	0.190

Notes:
Similar practices have been used in previous research on human resource and performance in SMEs. For example, Nguyen and Bryant (2004) examined the following practices: recruitment and selection; training; job descriptions; performance appraisals; and human resource plans. Focusing specifically on high-performance work system practices, Razouk (2011) included the following in his analysis: appraisals; participation; sharing information; compensation; and communication. The Workplace and Employment Relations Survey also used similar practices and reported that these practices were more common in SMEs than previously evidenced (Forth et al., 2006).
The numbers in Table 7 represent the percentage of sample firms where the human resource practice applied to 90% or more of the workforce. Thus, for example, in relation to 'Performance Appraisal' (B), 58.7% and 67.2% of sample firms used this practice, and it was applicable to 90% or more of these firms' workforces.

Acknowledgements

I am grateful to Marc Blunden, University of Brighton, for research assistance.

Notes

1. See Marlow (2002) and Ram et al. (2001) for analyses of how changes in the regulatory environment impacts the formality of human resource practices. See also Reed (2010) for a detailed discussion of labour market regulation and deregulation within the EU and the UK since 1979.
2. It is also recognised that another significant limitation of the extant literature is the 'black box' problem, which addresses issues of human resource *processes*: the 'why' of any human resource–performance relationship (see for example, Guest, 2011; Sanders and Frenkel, 2011). In order to investigate these 'why' issues, a multiple survey respondent and/or case study approach is required, which was beyond the scope of this article.
3. Thus, using the target response rate of 25 percent and a desire for broadly equal responses across the selected sectors, the following quotas were set for completed interviews: 1500 with 150–170 interviews in each of the nine sectors in 2007; 1540 with 150–170 in each sector; and for the panel, 397–400 with 40–50 completed interviews in each sector.
4. See the generally regarded seminal list by Pfeffer (1994), and a recent application by Guest and Conway (2011) in the context of large firms. See also Michie and Sheehan (2008), Nguyen and Bryant (2004) and Razouk (2011) in the context of SMEs.
5. I am grateful to an anonymous referee of this journal for highlighting this important issue.
6. Although there was a general consensus among respondents that the UK labour market was very highly regulated, in reality, among the 30 Organisation for Economic Co-operation and Development (OECD) members, the UK had the third lowest level of employment protection (only Canada and the USA had less protection in place in 2008; see OECD, nd).
7. Objective data were available from either Dun & Bradstreet or Companies House for approximately 80 percent of the sample firms. Firms employing under 25 people and in the service sector were the least likely to have any objective data available.
8. There were 24 variables in each time period (17 human resource variables + 3 performance measures + 4 control variables).
9. The analysis was disaggregated by the study's nine sectors. While the coefficients for the following industries were negative in the panel sample when all of the industries were entered in as separate coefficients (experiments were undertaken with various base categories, such as 'Printing' (SIC 18.1) and 'Management Consultants' (SIC 70.2): 'Restaurants and mobile food services' (SIC 56.1) and 'Beverage serving activities' (SIC 56.3), none of the sectors' effects were statistically significant. Given the relatively small sample sizes for the panel at this level of disaggregation, analysis was undertaken also for the full samples in 2007 and 2011. Interestingly, in 2007 'Restaurants and mobile food services' (SIC 56.1) and 'Beverage serving activities' (SIC 56.3) were significant and negative at the 0.05 and 0.10 levels respectively in the 2007 estimates; while 'Management and consultancy services' (SIC 70.2) and 'Architectural and engineering activities' (SIC 71.1) were significant and positive at the 0.05 and 0.10 levels respectively in the 2007 estimates. None of these disaggregated industry results were significant in 2011. This may reflect some convergence in the use of formal human resource practices across industries in UK SMEs.
10. See Guest (2011) for a recent discussion. Ramsay et al. (2000) demonstrate the essential mediating role that employees have in any HRM–performance relationship; Nadin and Cassell (2007) show the mediating effect of the psychological contract. See also Verreynne et al. (2011) for a multi-respondent approach to the analysis of employment systems.
11. See also Gouldner (1954) for a theoretical discussion of why informal practices are likely to remain so important in the context of SMEs.

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