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Human resource management systems and organizational performance: a test of a mediating model in the Greek manufacturing context

Anastasia A. Katou and Pawan S. Budhwar

Abstract This paper investigates the relationship between systems of HRM policies and organizational performance. The research is based on a sample of 178 organizations operating in the Greek manufacturing sector. A mediation model is tested to examine the link between HRM and organizational performance. The results of this study support the hypothesis that the relationship between the HRM systems of resourcing–development and reward–relations, and organizational performance, is mediated through the HRM outcomes of skills and attitudes. The paper not only supports the theory that HRM systems have a positive impact on organizational performance but also explains the mechanisms through which HRM systems improve organizational performance.

Keywords HRM systems; business strategies; HRM outputs; mediating model; Greek manufacturing.

Introduction

Since the concept of human resource management (HRM) emerged in the early 1980s in the US/UK, many models have been developed which imply a ‘direct’ relationship between individual human resources (HR) practices, as well as internally consistent systems of HR practices, and organizational performance (e.g., Schuler and Jackson, 1999). The major objective of these models has been generally to determine the extent to which individual HR practices and/or HRM systems directly enhance business performance.

With respect to this objective, some authors initially focused on the relationship between individual HR practices and organizational effectiveness, such as on staffing (Terpstra and Rozell, 1993), promotion systems (Ferris *et al.*, 1992), training (Bartel, 1994), compensation (Banker *et al.*, 1996; Gerhart and Milkovich, 1990) and early retirement programmes (Davidson, 1996). Later, the dominant trend in this research has been to take a systems view to link either HRM systems (Arthur, 1994; Huselid, 1995; Huselid and Becker, 1996; Huselid *et al.*, 1997; MacDuffie, 1995; Youndt *et al.*, 1996) or industrial relations systems (Cutcher-Gershenfeld, 1991) to organizational effectiveness

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measures. Some studies have analysed the effects of various HR practices on firm performance (Delery and Doty, 1996; Delaney and Huselid, 1996) or shareholder value (Abowd *et al.*, 1990). Generally, the systems view and the aggregation of individual HR practices into a composite index clearly seems to reflect the dominant thinking today.

Although most studies speak of HR practices leading to performance, such a one-way line of causation is unsatisfactory (Edwards and Wright, 2001). The usual key criticism of HR practices and organizational performance is that, rather than the HR practices leading to high performance, it is the highly performing firms that can afford costly HR practices (Huselid, 1995; Ichniowski *et al.*, 1997). However, even if using one-way line causation from HR practices to business performance, sound theoretical development that explains how such HR practices operate is rather absent (Becker and Gerhart, 1996; Becker and Huselid, 1998; Ferris *et al.*, 1998; Guest, 1997). In an effort to address such theoretical developments in the area, scholars have proposed to consider intermediate linkages between HR practices, or HRM systems, and business performance (e.g., Ferris *et al.*, 1998).

Thus, the general consensus developed among researchers is that HR practices and HRM systems do not lead directly to business performance. Rather they influence firm resources, such as the human capital, or employee behaviours, and it is these resources and behaviours that ultimately lead to performance (Delery, 1998; Wright *et al.*, 1994). This implicit model assumes that there are variables that mediate a link between HR practices and business performance, although only a few researchers (Boselie *et al.*, 2001; Fey *et al.*, 2000; Guest, 2001; Huselid, 1995; MacDuffie, 1995; Park *et al.*, 2003; Paul and Anantharaman, 2003) have measured these mediators and addressed their importance.

Considering the above developments, Delery (1998) argues that 'it is important that future research attempts to specify the mediators and attempts to collect measures of these constructs. This issue is crucial for continued theoretical development in SHRM.' Furthermore, Bowen and Ostroff (2004) argue that the question still left unanswered is the process through which HRM systems impact on organizational performance. Moreover, Doty and Delery (1997) argue that HR practices influence firm performance by creating a workforce that is skilled, motivated and empowered. Fey *et al.* (2000) provided some support for the use of HR outcomes (motivation, retention and development) as mediating variables between HR practices and firm performance. Guest (2001) used employee satisfaction and commitment, or employee quality, commitment and flexibility, as mediating variables. Boselie *et al.* (2001) indicated employee satisfaction, motivation, retention, presence, social climate and involvement as HRM mediating outcomes between HR practices and firm performance. Park *et al.* (2003) in their partial mediating model used employee skill, attitudes and motivation as mediating variables between HR systems and firm performance. Paul and Anantharaman (2003) indicated that the intervening variables of employee competence, teamwork, organizational commitment and customer orientation affect the organizational performance variables of employee retention, employee productivity, product quality, speed of delivery and operating cost, which then determine financial performance. Bowen and Ostroff (2004) argue that climate constitutes a key mediating factor in the HRM-performance relationship.

Further, the literature highlights that most studies examining the relationship between HRM and an organization's performance have been conducted in the US/UK. To fill this gap and to further examine the process or the so-called 'black-box' (Park *et al.*, 2003) through which HR practices impact organizational performance, it is important to conduct research in non-US/UK contexts. In order to contribute to this significant gap,

this paper investigates how HRM systems influence organizational performance in the Greek context. In order to make the analyses comprehensive, the role of mediating variables in the HRM outcomes and organizational performance is examined. The remainder of the paper is organized as follows. The next section presents the main theoretical developments, the research hypotheses and an operational model to test the same. This is followed by methodology, analysis of results, discussion and finally conclusions, contributions and limitations of the analysis.

Theory and hypotheses

As discussed above, there is a general consensus that HR practices contribute to organizational performance that is mediated through the development of HRM outcomes. The proposed model advocates that HRM systems lead to higher levels of HRM outcomes, leading to higher organizational performance. Figure 1 presents the general framework of mediating models. This is based on the contributions of a number of scholars (e.g., Boselie *et al.*, 2001; Fey *et al.*, 2000; Guest, 2001; Park *et al.*, 2003; Paul and Anantharaman, 2003). In these models, one can see both ‘*direct linkage*’, and ‘*indirect linkage*’ via HRM outcomes, between HR practices and organizational performance (Harel and Tzafrir, 1999). However, it is not necessary for these linkages to be present simultaneously. It is very possible, even in the absence of a direct linkage, for some practices to contribute significantly to business performance through the intervening process.

Paul and Anantharaman (2003) summarized some conceptual models that refer to mediating processes. Beer *et al.* (1984) identified competence, commitment, congruence and cost-effectiveness as intermediary variables. Becker and Huselid (1998) proposed that intervening variables such as employee skills, employee motivation, job design and work structure link to operating performance, which in turn influences profits and market value. Ferris *et al.* (1998) proposed a social context model that identified organizational climate, employee attitudes and employee behaviour as intervening factors. Chadwick and Cappelli (1999) examined the role of SHRM from a resource-based view and argued that systems of HR practices may lead to higher performance by developing and exploiting key internal capabilities that lead to sustained competitive advantage.

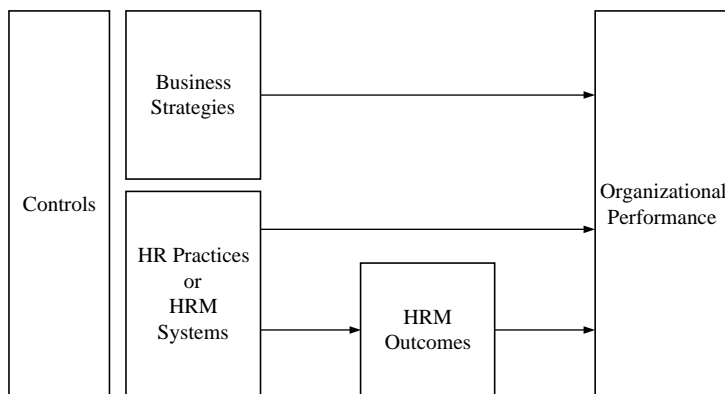


Figure 1 *Mediating model*

The rationale of the 'HRM–performance linkage model' presented in Figure 1, and the hypotheses to be tested, are discussed below.

Organizational performance

The chief strategic goal of any business is higher financial performance or maximization of wealth for the shareholders (Becker and Huselid, 1998; Paul and Anantharaman, 2003). However, achieving the organization's ultimate objective, i.e., profits, will obviously depend on the degree to which its organizational performance is reached (Delaney and Huselid, 1996; Delery, 1998). Organizational performance is usually indicated by indices such as:

- *Effectiveness*: if the organization meets its objectives (Dyer and Reeves, 1995; Ostroff and Schmitt, 1993).
- *Efficiency*: if the organization uses the fewest possible resources to meet its objectives (Dyer and Reeves, 1995; Rogers and Wright, 1998).
- *Development*: if the organization is developing in its capacity to meet future opportunities and challenges (Phillips, 1996).
- *Satisfaction*: of all participants – stakeholders, employees, customers (Delaney and Huselid, 1996).
- *Innovation*: for products and processes (Guest, 2001).
- *Quality*: percentage of products of high quality (Delaney and Huselid, 1996; MacDuffie, 1995; Richardson and Thompson, 1999).

HRM outcomes

The organizational performance of an organization depends to a large extent on human resources, processes and technology (Curtis *et al.*, 1995). For human resources to be effective with processes and technology, the human resources in an organization must be:

- at the '*right number and competent*' enough with the required knowledge, skills and abilities (Barney, 1991; Huselid, 1995; Lado and Wilson, 1994; Park *et al.*, 2003; Pfeffer, 1994; Richardson and Thompson, 1999; Sandberg, 2000; Schuler, 1989);
- '*motivated*' (Arthur, 1994; Fey *et al.*, 2000; Guest, 1999; Huselid, 1995; Park *et al.*, 2003; Pfeffer, 1994; Schuster, 1998);
- '*satisfied*' (Boselie *et al.*, 2001; Guest, 2001; Wallace, 1995);
- '*committed*' (Beer *et al.* 1984; Dowling and Richardson, 1997; Ulrich, 1997; Yeung and Berman, 1997);
- '*cooperated*' (Guest, 1997; Park *et al.*, 2003);
- within the organization (counterpart of '*turnover*') (d'Arcimoles, 1997; Arthur, 1994; Boselie *et al.*, 2001; Fey *et al.*, 2000); and
- present (counterpart of '*absenteeism*') (d'Arcimoles, 1997; Boselie *et al.*, 2001).

The HRM outcomes stated above are usually indicated as being outcomes with respect to: *skills*, i.e. competent (Guest, 2001; Park *et al.*, 2003) and cooperated (Richardson and Thompson, 1999); *attitudes* – motivation, commitment, satisfaction (Park *et al.*, 2003); and *behaviour*, i.e. turnover and absenteeism (Guest, 2001; Richardson and Thompson, 1999)

Specifically, competence is an important factor that affects organizational effectiveness, thus when employees are competent they are more likely to help the organization to perform well (Fey *et al.*, 2000; Wright *et al.*, 1994). Considering that

the synergy between competent individuals is a necessary requirement for organizational effectiveness, cooperation among employees is more likely to help the organization to perform well (Paul and Anantharaman, 2003). In order to bring lasting and better results and to contribute significantly to the success of their organization, employees must be motivated, satisfied and committed (Beck and Wilson, 2000; Fey *et al.*, 2000; Guest, 2001; Paul and Anantharaman, 2003; Mowday, 1998). Furthermore, turnover and absenteeism may have a negative impact on organizational effectiveness (d'Arcimoles, 1997; Arthur, 1994; Boselie *et al.*, 2001). Unless the organization is able to retain its employees, it will not be able to capitalize on the human assets developed within the organization (Fey *et al.*, 2000). Generally, if employees have good attitudes and behaviours they are more likely to work for the benefit of the organization, thereby positively affecting firm performance (Arthur, 1994; Park *et al.*, 2003).

To summarize, the proposed operational model reflects partly the contribution of the US writers who view workers primarily as resources or objects and, therefore, focus on productivity indicators, such as effectiveness and efficiency (Storey, 1997), and partly of the UK writers who apply a stakeholder perspective and, therefore, focus on HRM outcomes such as competency, motivation, satisfaction, commitment, cooperation, retention and absenteeism (Guest and Peccei, 1994). Taken as a whole, the operational model suggests that HRM outcomes affect organizational performance. Considering that most investigations in this regard have been conducted in the US/UK context and we have less research on the nature of HRM systems in the Greek context (see Voudouris *et al.*, 2000), it will be sensible to start from a basic level of analysis. In this regard we expect:

Hypothesis 1: A positive relationship exists between HRM outcomes and organizational performance in Greek organizations.

HRM systems

In explaining the significance of human resources to organizational performance, the majority of work in strategic HRM has adopted the 'resource-based' view of the firm (Barney, 1991). According to this view, an organization can gain competitive advantage by attracting and retaining the best human resources (Delery, 1998). Accordingly, HRM policies can be grouped into two HRM systems: the systems aiming at '*attracting*' human resources, and '*retaining*' human resources.

Huselid (1995) highlights two HRM systems: '*employee skills and organizational structures*' (including a broad range of HRM policies intended to enhance employees' knowledge, skills and abilities); and '*employee motivation*' (composed of HRM policies designed to recognize and reinforce desired employee behaviours). Conceptually speaking, core competencies among employees are developed through selection, training and design of work (first HRM system) and are subsequently reinforced through employee motivation (second HRM system).

Delaney and Huselid (1996) suggest three HRM systems, namely '*employee skills*' (referring to staffing selectivity and training); '*employee motivation*' (referring to incentive compensation and grievance procedure); and '*structure of jobs and work*' (referring to decentralized decision making, internal labour market and vertical hierarchy).

Youndt *et al.* (1996) propose two HRM systems: '*administrative HR system*' (including selection for manual and physical skills, policies and procedures training, results-based performance appraisal, individual equity, individual incentives and hourly

pay); '*human-capital-enhancing HR system*' (consisting of selective staffing, selection for technical and problem-solving skills, developmental and behaviour-based performance appraisal, external equity, group incentives, skill-based pay and salaried compensation).

Huselid *et al.* (1997) conceptually define two HRM systems: '*technical HRM effectiveness*' (describing perceptions of how well the HRM function performs activities traditionally associated with personnel management, including HRM policies such as recruitment, selection, training, performance appraisal and compensation administration); and '*strategic HRM effectiveness*' (explaining perceptions of how well the HRM function retains employees to support the business needs, including HRM policies such as cooperation, involvement and communications).

Ngo *et al.* (1998) present four HRM systems: '*structural training and development*' (measuring the firm's training and development policies); '*retention-oriented compensation*' (measuring the firm's compensation policies); '*seniority-based compensation*' (indicating that compensation is tied to seniority and the job title); and '*diversity*' (measuring the extent to which the staff is composed of expatriates).

From the works stated above, although the number and type of HRM systems differ according to the aims and objectives of each individual work, two HRM systems are usually present in almost all works. The first HRM system refers to the HRM policies of resourcing and development, aiming at attracting and developing human resources, and the second refers to the HRM policies of rewards and relations, aiming at retaining and motivating human resources. Thus, we distinguish the following two HRM systems:

- *Resourcing and development*: which includes the HRM policies of recruitment (Boxall, 1996; Marchington and Grugulis, 2000); selection (Phillips, 1996); separation (Foot and Hook, 1999); flexible work arrangements (Foot and Hook, 1999); individual and team training and development (Boxall, 1996; Marchington and Grugulis, 2000; Pfeffer, 1998); monitoring training and development (Fey *et al.*, 2000; Foot and Hook, 1999); careers (Doyle, 1997; Fey *et al.*, 2000; Paul and Anantharaman, 2003); work design (Patterson *et al.*, 1997); performance appraisal (Lado and Wilson, 1994; Latham and Wexley, 1981; Pfeffer, 1998; Paul and Anantharaman, 2003; Snell and Dean, 1992); and
- *Reward and relations*: which includes the policies of job evaluation (Foot and Hook, 1999); compensation (Beer *et al.*, 1984; Paul and Anantharaman, 2003; Roberts, 1997); promotion arrangements (Guest, 1997; Pfeffer, 1995); incentive schemes (Gomez-Mejia and Wellbourne, 1988; Marchington and Grugulis, 2000); benefits (Mowday *et al.*, 1982; Paul and Anantharaman, 2003); employee participation (Harel and Tzafrir, 1999; Marginson *et al.*, 1988; Pfeffer, 1994; Verma, 1995; Wagner, 1994); employee involvement (Marchington and Goodman, 1992); communications (Pfeffer, 1994, 1998; Marchington and Grugulis, 2000); and health and safety (Miner and Crane, 1995; Phillips, 1996).

Summarizing the above discussion and considering the resource-based view of the firm (Barney, 1991; Chadwick and Cappelli, 1999), we may say that the HRM systems of attracting and retaining human resources (Delery, 1998) influence directly or indirectly organizational performance (Harel and Tzafrir, 1999) by creating a workforce that is competent and cooperated (Doty and Delery, 1997), motivated, committed and satisfied (Guest, 2001) and being present and staying within the organization (Boselie *et al.*, 2001). In other words, the HRM outcomes of skills (competent, cooperation), attitudes (motivation, commitment, satisfaction) and behaviours (turnover, absenteeism) may

mediate HRM systems and organizational performance (Becker and Huselid, 1998; Park *et al.*, 2003; Paul and Anantharaman, 2003). Thus, according to these relationships depicted in the operational model we further hypothesise that:

Hypothesis 2: A positive relationship exists between HRM systems and HRM outcomes in the Greek context.

This hypothesis is generally accepted (e.g., Park *et al.*, 2003; Paul and Anantharaman, 2003) because organizations implement various HRM policies in order to create a skilled (based on HRM policies such as careful recruitment, selection, training and development), motivated, committed and satisfied (based on HRM policies such as employee involvement, communication, performance related pay) workforce in order to be able to accomplish successfully various tasks in the organization (Wright and McMahan, 1992).

Hypothesis 3: A positive relationship exists between HRM systems and organizational performance in Greek firms.

This hypothesis emphasizes that the organization is developing a range of interconnected and mutually reinforcing HRM policies, depicted in HRM systems such as resourcing-development and reward-relations, that help to make a significant improvement to an organization's performance (Huselid, 1995; Pfeffer, 1998; Schuler and Jackson, 1999).

Hypothesis 4: Increases in HRM outcomes mediate the relationship between HRM systems and organizational performance.

The impact of the HRM function on organizational performance is not in dispute. However, the extent to which the HRM outcomes are reached will influence the success the organization has in attaining its performance objectives (Armstrong, 1996; Guest, 1997; Richardson and Thompson, 1999).

Business strategies

The ability to gain and retain competitive advantage is crucial to an organization's growth and prosperity. The concept of competitive advantage is described by Porter as the essence of competitive strategy. For an organization to gain and retain competitive advantage there are three generic business strategies: cost, quality and innovation (for details see Porter, 1980, 1985). We have chosen Porter's theory of generic business strategy for our study for a number of reasons. First, it has been shown to be a relatively powerful predictor of organizational effectiveness (Youndt *et al.*, 1996). Second, scholars (see Schuler 1989; Schuler and Jackson 1987) highlight its implications for an organization's HRM policies. Third, the theory has been commonly used in the SHRM literature (Guest, 1997; Huang, 2001; Othman, 1996; Sanz-Valle *et al.*, 1999), but its examination in the Greek context was rather limited (see Panayotopoulou *et al.*, 2003).

One can expect a positive relationship between the cost, quality and innovation strategies and financial performance (Huselid, 1995; Kintana *et al.*, 2003, Panayotopoulou *et al.*, 2003). Firms pursuing a cost strategy aim at minimizing overheads and maximizing economies of scale and thus expect positive financial results (Shuler and Jackson, 1987). Firms pursuing a quality strategy aim at delivering high-quality goods and services to customers emphasizing resource effectiveness and productivity, characteristics that fit the rationale of a goal model (Cameron and Quinn,

1999). Firms pursuing an innovation strategy aim at making the organization the unique producer, suggesting that the organization gains and retains competitive advantage through adaptation to its environment (Segev, 1989).

However, although the quality and innovation strategies are expected to reinforce organizational performance considering that the organization is capitalizing its intellectual capital and requiring its employees to become knowledge workers (Snell and Dean, 1994; Youndt *et al.*, 1996), this may not be the same with respect to the relationship between the cost strategy and organizational performance. It is possible that the application of a cost strategy can have a negative impact on organizational performance due to tight control in costs, such as less employee development, fewer incentives, fewer benefits, which may de-motivate people in their employment function, producing, therefore, lower organizational performance. Thus, although we expect a positive relationship between the quality and innovation strategies and organizational performance, on the other hand, we may expect a negative relationship between the cost strategy and organizational performance. This discussion could lead to another hypothesis with respect to business strategies. However, we did not follow this view because the purpose of the paper refers mainly to the mediating process of HRM and thus the introduction of the business strategies in the operational model is in the form of contingencies in order to control any effects strategy might have on organizational performance (Youndt *et al.*, 1996).

Methodology

Sample

A large questionnaire survey in a possible 23 industries in the Greek manufacturing sector was carried out between March and September 2002. A sample of 600 organizations was used from the main Greek directory – *ICAP* (2001). The sample was obtained by employing the stratified methodology. The strata were the 23 manufacturing sector industries including organizations with more than 20 employees. Although the critical value of 20 employees looks low, we decided to use this value because the Greek manufacturing sector is dominated by small firms (Ball, 1992, Voudouris *et al.*, 2000). Of the approximately 3,000 organizations, 20 per cent were randomly chosen from each stratum of the directory. Using personal connections/samplers, the questionnaires were taken personally to most organizations. This is a common practice in Greece (Brewster *et al.*, 1996; Panayotopoulou *et al.*, 2003). A response rate of approximately 30 per cent resulted in 178 usable questionnaires being returned. The distribution of the sample organizations was similar to the distribution of the population organizations, indicating that our sampling methodology returned a representative sample of the manufacturing sector of the Greek economy.

Most of the questions for the survey were drawn from existing international HRM surveys, such as the Price Waterhouse Cranfield Project Survey (Brewster and Hegewisch, 1994) and Hall and Torrington (1998), and generally from Phillips (1996), Othman (1996), Budhwar and Sparrow (1997), Sanz-Valle *et al.* (1999) and Richardson and Thompson (1999). The questionnaire was originally developed in English, then it was translated into Greek, and finally translated back from Greek to English. The translated questionnaire was piloted in ten organizations, and it was handed to the CEO, Personnel Officers or Financial Officers of the sample organizations. The survey questionnaire was completed by one person responsible for HR function in each firm. We acknowledge this as a limitation, however, in the absence of reliable research evidence,

getting information from the 'subject matter experts' is a good starting point (Budhwar and Sparrow, 1997). We discuss below issues related to common method bias.

Measures

HRM policies We used effectiveness (measured on a five-point Likert-type scale, where 1 = not at all effective to 5 = highly effective) of HRM policies as it refers to 'how well the HR practice is performing' (Huselid *et al.*, 1997; Richard and Johnson, 2001).

HRM systems For the classification of the HRM systems we followed the methodologies of Fey *et al.* (2000); Huselid (1995), Ichniowski (1997); Snell and Dean (1992), Tsui *et al.* (1997) and Youndt *et al.* (1996). However, in creating a HRM system variable in this study we followed a four step procedure. First, we presented a typology (theoretical grouping) of the HRM policies. Second, we verified empirically this typology, i.e., we presented taxonomy (empirical grouping) of the HRM policies. Third, we calculated Cronbach alphas to check the interrelatedness among the relevant items. Fourth, scores were calculated for each factor as the average of the scores on the individual HRM policies that loaded most strongly on that factor.

Table 1 presents the principal components factor analysis with varimax rotation on the 18 individual HRM policy items. The HRM policy items were factored into two factors. The first factor (HRM system) we label as '*resourcing and development*' which comprises recruitment, selection, separation, flexible work arrangements, training, monitoring training, career development, work design, performance appraisal, job evaluation and promotion arrangements. The second factor '*reward and relations*'

Table 1 Factor analysis results for the HRM policies items

	<i>Factor 1</i> <i>Resourcing and development</i>	<i>Factor 2</i> <i>Reward and relations</i>
Explained variation	34.820 per cent	26.790 per cent
Eigenvalues	9.972	1.117
Recruitment	0.719	0.353
Selection	0.716	0.325
Separation	0.692	0.231
Flexible work arrangements	0.423	0.316
Training	0.658	0.429
Monitoring training	0.757	0.261
Career development	0.759	0.357
Work design	0.718	0.326
Performance appraisal	0.689	0.380
Job evaluation	0.739	0.363
Compensation package	0.351	0.750
Promotion arrangements	0.614	0.451
Incentive schemes	0.345	0.720
Benefit package	0.322	0.803
Employee participation	0.256	0.883
Employee involvement	0.451	0.622
Communication	0.571	0.594
Health and safety	0.376	0.478
Cronbach alpha	0.9268	0.9020

comprises compensation package, incentive schemes, benefit package, employee participation, employee involvement, communication and health and safety. All items pass the eigenvalue (more than 1.00) and the cut-off points (factor loading not less than 0.40) requirements (for details regarding these requirements see Huselid *et al.*, 1997; Ngo *et al.*, 1998; Youndt *et al.*, 1996). Only the HRM policy of communication does not pass the requirement of cross-loading, which is less than 0.10. However, we decided to retain this item in factor 2, because its cut-off point is rather high (0.594), following Sanz-Valle *et al.* (1999). The Cronbach alphas of the two factors are very high (0.9268 and 0.9020) which are above the generally acceptable level of 0.70 (see Nunnally, 1978).

The two factors derived based on our data coincide with the conceptually derived HRM systems discussed above. With respect to the 18 items included in the analysis, only the two items of 'job evaluation' and 'promotion arrangements' do not fall into the factor indicated by the HRM systems. However, it may be taken that these two HRM policies are closely related with 'work design' and 'performance appraisal'. Thus, we can conclude that the conceptually derived HRM systems have been empirically validated with the two factors in the Greek context.

HRM outcomes A noteworthy attempt to measure mediating variables was presented by Tsui *et al.* (1997). However, in this study the mediating variables were measured under the philosophy of a perceived rating of the organization's HRM outcomes measure on a Likert-type scale ranging from (1) very bad to (5) very good. It must be noted here that a 'very good' rating for turnover or absenteeism corresponds to low turnover (high retention) or absenteeism (high presence). The reliability scores for each type of HRM outcomes are shown below. All Cronbach alphas are above the suggested reliability level of 0.70.

- *Skills*: competence, cooperation between managers and employees, cooperation among employees (Cronbach alpha = 0.9135)
- *Attitudes*: motivation, commitment, satisfaction (Cronbach alpha = 0.9104)
- *Behaviour*: turnover, absenteeism (Cronbach alpha = 0.8488)
- *All outcomes*: Cronbach alpha = 0.9517

In trying to verify the above typology of HRM outcomes we used confirmatory factor analysis, the results of which are shown in Table 2. The results show that only one 'general factor' of HRM outcomes emerged that explains 74.9 per cent of the variation.

Table 2 *Factor analysis results for the mediating variable items*

Explained variation	74.928 per cent
Eigenvalue	5.994
Cooperation between management and employees	0.870
Cooperation among employees	0.881
Right mix of employees	0.865
Motivation among employees	0.873
Absence rate	0.834
Turnover rate	0.829
Job satisfaction	0.897
Organizational commitment	0.873
Cronbach alpha	0.9517

However, this overall unification of relative variables is a common practice (see Benkhoff, 2000; Harel and Tzafrir, 1999; Tsui *et al.*, 1997).

Business strategies For the classification of business strategies we followed the methodologies of Huang (2001), Sanz-Valle *et al.* (1999) and Youndt *et al.* (1996). Business strategies were measured by eight items using a Likert-type scale (ranging from 1 = not very important to 5 = totally essential) that define potential competitive priorities in manufacturing, including cost, quality and innovation (Snell and Dean, 1992). However, in order to evaluate the impact of the business strategies (quality, innovation, cost) on performance we had to reduce the eight business strategy items into fewer (three) dimensions. In order to achieve this we conducted factorial analysis.

Table 3 presents the results of the principal component factor analysis with varimax rotation on the individual business strategy items. The business strategy items factored into three factors, passing the eigenvalue (more than 1.00) and the cut-off points requirements (factor loading not less than 0.40). Only 'quality enhancement' did not pass the cross-loading requirement (loadings not less than 0.10). However, we still retained this item in Factor 1 because its loading (0.579) is rather high. Its cross-loading (0.097) is close to the requirement (0.10) and it is a very representative item for Factor 1.

The first factor (business strategy dimension), which we label as 'Quality', comprises customer service, distribution channels, quality enhancement and brand image. The second factor, 'Innovation' comprises innovation, improvement of goods, and wide range of products. The final factor is that of 'Cost', i.e. cost reduction business strategy. The Cronbach alpha for the second factor is 0.5840, which is below the generally acceptable level of 0.70 (see Nunnally, 1978). However, considering that values as low as 0.35 have been found acceptable when used with other measures (Roberts and Wortzel, 1979), we decided to maintain the factor of innovation in spite of its low reliability (Huang, 2001).

Organizational performance variables We used multiple organizational performance variables which were measured under the philosophy of a perceived rating of the organization's performance on a Likert-type scale ranging from 1 = very bad to 5 = very good. Recognizing the potential problems with self-report measures, to ensure the reliability and the validity of the indexes and to minimize random fluctuations and anomalies in the data, the respondents were asked to report performance over the past

Table 3 Factor analysis results for the business strategy items

	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>
Explained variation	33.200 per cent	22.010 per cent	13.739 per cent
Eigenvalues	3.242	1.256	1.018
Cost reduction	0.071	0.176	0.908
Customer service	0.789	-0.052	0.260
Distribution channels	0.842	0.059	0.033
Quality enhancement	0.579	0.482	0.167
Brand image	0.743	0.326	-0.157
Innovation	0.304	0.617	-0.382
Improvement of goods	0.226	0.804	0.057
Wide range of products	0.013	0.804	0.072
Cronbach alpha	0.7845	0.5840	

three years. Furthermore, beyond issues of reliability, such as random error, to ensure content validity, we used multiple indicators referring to effectiveness, efficiency and development (Venkatraman and Ramanujam, 1986; Youndt *et al.*, 1996). To assess the convergence and the divergence among the organizational performance items (i.e. construct validity), we used principal components factor analysis with varimax rotation to determine the underlying dimensionality of the performance measures (Youndt *et al.*, 1996), the results of which are shown in Table 4. The results show that only one 'general factor' of organizational performance dimensions emerged that explains 74.5 per cent of the variation. The Cronbach alpha score for these variables is 0.9288.

Controls Several control variables were included in the analysis, to capture other organizational and environmental forces that are related to both the adoption of HRM policies and organizational performance (Delaney and Huselid, 1996), because the choice of control variables in the analysis (regression) can have an important effect on the results (Guest, 2001). The control variables included in the analysis are as follows:

- *Size*: to capture size and scale effects, since large organizations may be more likely than small ones to have well-developed HRM policies (Huselid, 1995; Youndt *et al.*, 1996). The size variable is referred as the natural logarithm of the number of total employees in the organization (Delaney and Huselid, 1996; Youndt *et al.*, 1996). The log of this variable is taken so that a few large firms would not affect the results disproportionately (Fey *et al.*, 2000).
- *Age*: is used to capture any founding values of the organization (Delaney and Huselid, 1996). Age has been calculated as the difference of 2001 (year of survey) minus the founding year of the organization. We also took the log of this variable so that a few old firms would not affect the results disproportionately.
- *Life cycle stage*: is adopted to capture maturity effects of the organization or to assess stage of organization development (Delaney and Huselid, 1996; Lumpkin and Dess, 1996; Richard and Johnson, 2001). It is used for five stages: introductory, growth, maturity, decline and turnaround.
- *Unions*: There is much evidence that unions affect firm performance (Arthur, 1994; Freeman and Medoff, 1984; Huselid, 1995). The degree of unionization is examined at different levels, i.e. 0 per cent, 1–25 per cent, 26–50 per cent, 51–75 per cent and 76–100 per cent.
- *Capital intensity*: is used to capture the variations in the amount of capital on performance (Hayes *et al.*, 1988; Huselid, 1995; Richard and Johnson, 2001). It refers to the natural logarithm of total assets by total employment.

Table 4 *Factor analysis results for the perceived organizational performance variable items*

Explained variation	74.474 per cent
Eigenvalue	4.468
Effectiveness	0.885
Efficiency	0.872
Development	0.886
Satisfaction	0.903
Innovation	0.830
Quality	0.797
Cronbach alpha	0.9288

- *Industry*: is used to capture all the other industry specific effects (Delbridge and Whitfield, 1999). In this study we classify 78 organizations as being ‘*traditional*’ (food products, beverages, textiles and textile products, linen, wearing apparel, footwear and leather products) because the primary inputs for their production come mainly from the agricultural sector, which still is the traditional sector in Greece. The rest of the sample organizations belong to industries such as chemicals, metal products, office machinery, electrical equipment, etc. We classify these as ‘*modern*’ organizations, because the primary inputs for their production do not come from the agricultural sector.

We acknowledge that our study might be affected by common method bias as the same respondent provided data on the independent variables of HRM policies and business strategies, and on the dependent variables of organizational performance. However, the common method bias may be limited in our study because the size of the sample is rather large (Cooper and Emory, 1995); in the questionnaire, the dependent variables followed, rather than preceded, the independent variables (Salancik and Pfeffer, 1977); many different types of measures were used in the questionnaire (Eisenhardt and Tabrizi, 1995); and the data-gathering process was rather exhaustive for a single respondent due to the very large length of the questionnaire (Kintana *et al.*, 2003). Furthermore, the application of Harman’s single factor test (Harman, 1967) to all the relevant variables in the model, using the eigenvalue greater than one criterion, revealed seven factors, and not just one. Thus, we believe that the common method bias in the data was relatively limited.

Statistical analysis

The statistical method used in the analysis was hierarchical regression, testing for mediation effects. Considering that mediation is a hypothesized causal chain in which one variable (X) affects a second variable (M) that, in turn, affects a third variable (Y), this procedure is to conduct the following regressions (Baron and Kenny, 1986):

- *Step 1*: Conduct a regression analysis with X predicting Y to test if there is an effect that may be mediated, $Y = a + bX + e$.
- *Step 2*: Conduct a regression analysis with X predicting M to test if X is related to M, $M = a + bX + e$.
- *Step 3*: Conduct a regression analysis with M predicting Y to test if M is related to Y, $Y = a + bM + e$.
- *Step 4*: Conduct a regression analysis with X and M predicting Y to test if M completely mediates Y, $Y = a + b_1X + b_2M + e$.

Paths from X to M and from M to Y are the ‘*direct effects*’. The mediation effect in which X leads to Y through M is the ‘*indirect effect*’. The indirect effect represents the portion of the relationship between X and Y that is mediated by M (Newsom, 2002). The purpose of Steps 1 to 3 is to establish that ‘*zero-order*’ relationships among the variables exist. If one or more of these relationships are non-significant, mediation is not likely. Assuming there are significant relationships from Steps 1 through 3, one proceeds to Step 4. In Step 4, some form of mediation is supported if the effect of M remains significant after controlling for X. If X is no longer significant when M is controlled, the findings support ‘*full mediation*’. If X is still significant (i.e. both X and M significantly predict Y), the finding supports ‘*partial mediation*’ (Kenny, 2003).

Table 5 Means, standard deviations and correlations between HRM systems, HRM outcomes and organizational performance

		Mean	Standard deviation	HS1	HS2	OHRMS	G1	G2	G3	OHRMO	OOP
HS1	Resourcing and development	3.2064	0.7896	1.000							
HS2	Reward and relations	3.3672	0.7744	0.811	1.000						
OHRMS	Overall HRM system	3.2636	0.7534	0.971	0.927	1.000					
G1	Skills	3.4024	0.9011	0.747	0.770	0.791	1.000				
G2	Attitudes	3.2974	0.9569	0.777	0.788	0.819	0.855	1.000			
G3	Behaviour	3.5030	0.9577	0.647	0.627	0.684	0.726	0.815	1.000		
OHRMO	Overall HRM outcome	3.3593	0.8728	0.791	0.801	0.834	0.942	0.960	0.897	1.000	
OOP	Overall Org. performance	3.6075	0.8810	0.741	0.813	0.811	0.777	0.788	0.587	0.794	1.000

Note: All correlations are significant at the 0.01 level.

Although Steps 1 to 4 can be used to judge informally whether or not mediation is occurring, Judd and Kenny (1981) and Sobel (1982) have popularized statistical-based methods by which mediation may be formally assessed. Preacher and Leonardelli (2001) produced an interactive programme to calculate the critical z ratio as a test of whether the indirect effect of X on Y via the mediator M is significantly different from zero. The programme reports the p-values from the unit normal distribution under the assumption of a two-tailed z-test of the hypothesis that the mediated effect equals zero in the population (Goodman, 1960; Sobel, 1982).

The mediation methodology stated above can be extended to include situations where additional variables need to be considered, even if they are somewhat tangential to the direct mediating relationship. It is important to include the control of other variables in the regressions because if these variables were omitted, then the serious problem of specification error will be produced (Kenny, 2003).

Table 6 Aggregate regression results for testing mediation of OHRMO

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Controls</i>	OOP	OHRMO	OOP	OOP
(Constant)	0.747 (0.079)	0.562 (0.265)	1.075 (0.020)	0.962 (0.011)
Life cycle stage	-0.212 (0.000)	-0.024 (0.729)	-0.230 (0.000)	-0.207 (0.000)
Union intensity	-0.066 (0.019)	-0.011 (0.745)	-0.051 (0.086)	-0.038 (0.122)
Age	0.083 (0.265)	-0.077 (0.386)	0.115 (0.160)	0.066 (0.317)
Capital intensity	0.090 (0.049)	0.112 (0.041)	-0.012 (0.818)	0.044 (0.282)
Size	0.092 (0.027)	-0.031 (0.538)	0.120 (0.009)	0.097 (0.010)
Industry	-0.018 (0.819)	0.097 (0.305)	-0.075 (0.389)	-0.039 (0.581)
<i>Business strategies</i>				
Quality	-0.060 (0.330)	0.097 (0.187)	-0.034 (0.614)	-0.032 (0.561)
Innovation	0.044 (0.483)	-0.131 (0.091)	0.138 (0.043)	0.001 (0.986)
Cost	-0.145 (0.001)	-0.098 (0.069)	-0.106 (0.039)	-0.139 (0.001)
<i>Mediators</i>				
OHRMO			0.736 (0.000) [0.049]	0.321 (0.000) [0.069]
OHRMS	1.005 (0.000) [0.055]	1.036 (0.000) [0.065]		0.661 (0.000) [0.086]
R ²	0.796	0.741	0.728	0.845
Adjusted R ²	0.779	0.718	0.706	0.830
F	47.301 (0.000)	32.531 (0.000)	33.164 (0.000)	56.109 (0.000)
N	132	132	135	125

Note: Significant levels in parentheses; Standard errors in brackets.

Results

Table 5 displays the means, standard deviations and correlations of all the variables involved in the analysis. The results show that the correlations between the variables that represent HRM outcomes (skills, attitudes, behaviour) are very high ranging from 0.726 to 0.885. Furthermore, the correlations between the variables that represent HRM systems (resourcing and development, and reward and relations) are also very high, at the level of 0.811. Moreover, the correlations between the HRM systems variables and the HRM outcomes variables are also very high, ranging from 0.627 to 0.788. This means that where these variables were used in the investigation of mediation, possible multicollinearity may be present. In order to alleviate the possible problem of multicollinearity, Table 6 presents the results of the regression analysis for testing the effects of the overall HRM system (OHRMS) on the overall organizational performance (OOP), using as mediator the overall HRM outcome (OHRMO). The mediation effect is tested through the steps presented above:

- 1 From the regression results in Model 1, we see that HRM system positively affects organizational performance, thus supporting Hypothesis 3.

Table 7 Aggregate backward regression results for testing mediation of OHRMO

	<i>Model 1b</i> <i>OOP</i>	<i>Model 2b</i> <i>OHRMO</i>	<i>Model 3b</i> <i>OOP</i>	<i>Model 4b</i> <i>OOP</i>
<i>Controls</i>				
(Constant)	0.875 (0.025)	0.107 (0.775)	1.317 (0.001)	1.218 (0.000)
Life cycle stage	-0.188 (0.00)		-0.205 (0.000)	-0.189 (0.000)
Union intensity	-0.054 (0.037)			
Age				
Capital intensity	0.094 (0.034)	0.086 (0.082)		
Size	0.091 (0.02)		0.099 (0.010)	0.087 (0.005)
Industry				
<i>Business strategies</i>				
Quality			0.119 (0.031)	
Innovation				
Cost	-0.150 (0.001)	-0.097 (0.064)	-0.117 (0.020)	-0.151 (0.000)
<i>Mediators</i>				
OHRMO			0.725 (0.000) [0.047]	0.335 (0.000) [0.066]
OHRMS	0.995 (0.000) [0.050]	1.046 (0.000) [0.060]		0.628 (0.000) [0.081]
R ²	0.793	0.724	0.718	0.840
Adjusted R ²	0.783	0.717	0.707	0.833
F	79.996 (0.000)	105.541 (0.000)	65.562 (0.000)	124.502 (0.000)
N	132	125	135	125

Note: Significant levels in parentheses; standard errors in brackets.

Table 8 Regression results for testing mediation of HRM outcomes

	<i>Model 5</i> <i>OOP</i>	<i>Model 6</i> <i>G1</i>	<i>Model 7</i> <i>G2</i>	<i>Model 8</i> <i>G3</i>	<i>Model 9</i> <i>OOP</i>	<i>Model 10</i> <i>OOP</i>
<i>Controls</i>						
(Constant)	0.676 (0.115)	0.387 (0.465)	−0.072 (0.896)	1.766 (0.019)	1.456 (0.001)	1.044 (0.008)
Life cycle stage	−0.211 (0.000)	−0.056 (0.424)	0.023 (0.761)	0.025 (0.812)	−0.223 (0.000)	−0.202 (0.000)
Union intensity	−0.070 (0.013)	−0.061 (0.084)	−0.025 (0.493)	0.088 (0.072)	−0.022 (0.454)	−0.028 (0.271)
Age	0.092 (0.219)	−0.046 (0.619)	−0.015 (0.875)	−0.233 (0.076)	0.055 (0.481)	0.051 (0.442)
Capital intensity	0.082 (0.074)	0.136 (0.019)	0.136 (0.025)	0.028 (0.729)	−0.023 (0.635)	0.028 (0.499)
Size	0.100 (0.018)	−0.023 (0.661)	−0.013 (0.807)	−0.048 (0.522)	0.107 (0.014)	0.101 (0.007)
Industry	−0.025 (0.751)	0.052 (0.597)	0.115 (0.267)	0.034 (0.811)	−0.100 (0.225)	−0.049 (0.480)
<i>Business strategies</i>						
Quality	−0.070 (0.258)	0.111 (0.156)	0.019 (0.814)	0.135 (0.215)	−0.023 (0.721)	−0.040 (0.471)
Innovation	0.047 (0.449)	−0.126 (0.116)	−0.055 (0.504)	−0.217 (0.053)	0.083 (0.202)	−0.006 (0.911)
Cost	−7.138 (0.002)	−0.063 (0.270)	−0.134 (0.028)	−0.079 (0.313)	−0.091 (0.060)	−0.127 (0.002)
<i>HRM outcomes</i>						
Skills					0.393 (0.000)	0.231 (0.005)
					[0.085]	[0.080]
Attitudes					0.452 (0.000)	0.146 (0.104)

Table 8 (Continued)

	<i>Model 5 OOP</i>	<i>Model 6 G1</i>	<i>Model 7 G2</i>	<i>Model 8 G3</i>	<i>Model 9 OOP</i>	<i>Model 10 OOP</i>
Behaviours					[0.091] −0.113 (0.125) [0.073]	[0.089] −0.024 (0.700) [0.063]
<i>HRM systems</i>						
Resourcing and development	0.510 (0.000) [0.095]	0.563 (0.000) [0.121]	0.671 (0.000) [0.126]	0.507 (0.003) [0.166]		0.279 (0.004) [0.094]
Reward and relations	0.503 (0.000) [0.097]	0.458 (0.000) [0.123]	0.440 (0.001) [0.129]	0.386 (0.024) [0.169]		0.340 (0.000) [0.090]
R ²	0.799	0.722	0.727	0.489	0.761	0.853
Adjusted R ²	0.780	0.696	0.702	0.441	0.737	0.834
F	43.267 (0.000)	28.081 (0.000)	28.585 (0.000)	10.092 (0.000)	32.364 (0.000)	45.595 (0.000)
N	132	131	130	128	135	125

Note: Significant levels in parentheses; standard errors in brackets.

Table 9 Backward regression results for testing mediation of HRM outcomes

	<i>Model 5b</i> <i>OOP</i>	<i>Model 6b</i> <i>G1</i>	<i>Model 7b</i> <i>G2</i>	<i>Model 8b</i> <i>G3</i>	<i>Model 9b</i> <i>OOP</i>	<i>Model 10b</i> <i>OOP</i>
<i>Controls</i>						
(Constant)	0.821 (0.037)	−0.339 (0.235)	−0.141 (0.728)	0.535 (0.070)	1.672 (0.000)	1.167 (0.000)
Life cycle stage	−0.186 (0.000)				−0.227 (0.000)	−0.188 (0.000)
Union intensity	−0.056 (0.031)	−0.820 (0.004)				
Age						
Capital intensity	0.088 (0.050)	0.138 (0.012)	0.122 (0.024)			
Size	0.096 (0.016)				0.106 (0.003)	0.092 (0.003)
Industry						
<i>Business strategies</i>						
Quality						
Innovation						
Cost	−0.146 (0.001)		−0.135 (0.020)		−0.086 (0.068)	−0.141 (0.000)
<i>HRM outcomes</i>						
Skills					0.408 (0.000) [0.083]	0.238 (0.002) [0.076]
Attitudes					0.460 (0.000) [0.089]	0.131 (0.076) [0.073]
Behaviours					−0.140 (0.000) [0.089]	

Table 9 (Continued)

	<i>Model 5b</i> <i>OOP</i>	<i>Model 6b</i> <i>G1</i>	<i>Model 7b</i> <i>G2</i>	<i>Model 8b</i> <i>G3</i>	<i>Model 9b</i> <i>OOP</i>	<i>Model 10b</i> <i>OOP</i>
<i>HRM systems</i>						
Resourcing and development	0.521 (0.000) [0.094]	0.532 (0.000) [0.118]	0.655 (0.000) [0.123]	0.425 (0.009) [0.161]		0.270 (0.003) [0.089]
Reward and relations	0.477 (0.000) [0.094]	0.508 (0.000) [0.117]	0.447 (0.000) [0.122]	0.425 (0.004) [0.160]		0.313 (0.000) [0.086]
R ²	0.795	0.710	0.718	0.452	0.751	0.849
Adjusted R ²	0.783	0.701	0.709	0.443	0.739	0.840
F	68.683 (0.000)	77.100 (0.000)	79.538 (0.000)	51.559 (0.000)	64.372 (0.000)	93.716 (0.000)
N	132	131	130	128	135	125

Note: Significant levels in parentheses; standard errors in brackets.

- 2 From the regression results in Model 2, we see that HRM systems positively affect HRM outcome, hence supporting Hypothesis 2.
- 3 From the regression results in Model 3, we see that HRM outcomes positively affect organizational performance, i.e., support for Hypothesis 1.
- 4 From the regression results in Model 4, we see that both HRM systems and HRM outcomes positively affect organizational performance, thus supporting Hypothesis 4. Because both these variables are significant, this finding supports partial mediation (Kenny, 2003).

In order to test the indirect effect, we used Preacher and Leonardelli's (2001) interactive programme to calculate the critical z ratio. The values used in this interactive programme are taken from Table 7, where the non-significant variables are withdrawn from the relationships through backward regressions, in order to get more efficient estimates. The values used are $b = 1.046$, $s_b = 0.060$, $b_2 = 0.335$ and $s_{b_2} = 0.066$. The z values obtained are $z_{\text{Sobel}} = 4.873$ ($p = 0.000$), $z_{\text{Goodman(I)}} = 4.866$ ($p = 0.000$) and $z_{\text{Goodman(II)}} = 4.881$ ($p = 0.000$). These z values indicate that the indirect effect of HRM systems on organizational performance is significantly different from zero.

Having established that in aggregate variables HRM outcome mediates the effect of HRM system on organizational performance, we next try to verify the same thing using disaggregated variables with respect to HRM outcomes and HRM systems. Table 8 presents the results of the regression analysis and Table 9 presents the results of the backward regression analysis for testing the effects of the HRM systems of resourcing-development (HS1) and reward-relations (HS2) on the overall organizational performance (OOP), using as mediators the HRM outcomes of skills (G1), attitudes (G2) and behaviours (G3). As conducted above, the mediation effect is tested through the steps presented by Barron and Kenny (1986):

- 1 From the regression results in Model 5b, we see that the HRM systems of resourcing-development, and reward-relations positively affect organizational performance, hence supporting Hypothesis 3.
- 2 From the regression results in Models 6b, 7b and 8b, we see that the HRM systems of resourcing-development and reward-relations positively affect the HRM outcomes of skills, attitudes and behaviours, thus supporting Hypothesis 2.
- 3 From the regression results in Model 9b, we see that the HRM outcomes of skills and attitudes positively affect organizational performance, providing support for Hypothesis 1. The effect of behaviours on organizational performance is negative, and thus this is not supporting Hypothesis 1. It is imperative that this effect must be positive (and not negative as one usually expects) because high values of the absence and turnover rates questions in the questionnaire refer to 'very good' behaviour levels, meaning that due to the questions scaling, absence refers properly to presence and turnover refers properly to retaining.
- 4 From the regression results in Model 10b, we see that both the HRM systems of resourcing-development and reward-relations and the HRM outcomes of skills and attitudes positively affect organizational performance, hence supporting Hypothesis 4. Because both variables of HRM systems and HRM outcomes are significant, this finding supports partial mediation (Kenny, 2003).

Discussion

Considering the argument that 'no organization operates in a vacuum, and therefore, it is important to investigate internal and external organizational characteristics in order to be

able to understand the general relationship between HRM activities and perception of the firms' performance' (Harel and Tzafrir, 1999), we included in the regression models a set of control variables. In any case, the exclusion of explanatory variables, such as the controls and the business strategies, from a regression model would by definition mean that the model is not correctly specified. From the regression results presented, the following conclusions with respect to the control variables used may be derived.

With the introduction of the 'life cycle stage' variable we tried to capture maturity effects of the organization, or to assess the stage of organizational development. It is argued that HRM policies change over time, depending on whether the organization is in a stage of formation, growth, maturity or decline (see Budhwar and Sparrow, 1997). In our study we found that the stage of organizational development has negative effects on overall organizational performance. This result supports Schuler and Jackson's (1987a) proposition of impact of stages of organizational development on firms' performance.

There is much evidence that unions affect a firm's performance (Freeman and Medoff, 1984). In our study we found that union intensity is negatively related to overall organizational performance and to employee skills. These findings contradict the results of Arthur (1994) and Huselid (1995), which support that the degree of unionization is positively related with productivity. Generally, we found that the more unionized a labour force is in an organization, the worse is its organizational performance. Perhaps this is more valid for the Greek context, where unions, as in many other developing countries, do not play a constructive role or are in a phase of transition towards playing a more cooperative role with management.

Superior performance becomes crucial in firms that make large investments in plant, equipment and other assets (Hayes *et al.*, 1988). In our research we found that capital intensity is positively related to overall organizational performance and to most HRM outcomes (skills, attitudes). Such developments help firms to develop their human resources continuously via various training and development programmes and keep them updated with latest competencies. This is important for the firm to achieve competitive advantage (Barney, 1991; Huselid, 1995).

We found that the variable of size is positively related to overall organizational performance and to most HRM outcomes (skills, attitudes). Such results are to be expected as it is now known that large firms tend to have established HRM systems which facilitate in improving performance of the organization (see Brewster *et al.*, 1996). On the other hand, the variable of age did not produce significant results in all regressions. One needs to be careful with this result due to possible multicollinearity of age with the variable of life cycle stage, which is usually employed to capture similar effects with age of the organization. In fact, the correlation coefficient between life cycle stage and age is significantly very high ($r = 0.486$, $p = 0.000$), indicating possible multicollinearity between these two variables.

After getting insignificant results by the use of 22 dummy variables to capture the 23 industry specific effects on performance, as explained above, we employed the 'traditional' and 'modern' classification of the sample organizations. However, we found that the 'industry' dummy variable did not produce significant results. This result may be due to a 'wrong' classification of the sample organizations.

In this study we followed the methodology proposed by Youndt *et al.* (1996) where the set of the business strategies was entered in the regression equations in order to control for any effects strategy might have on organizational performance. Significant effects would indicate a direct relationship between business strategies and organizational performance. Our results support the view that if the organization puts emphasis on the cost business strategy, this action will have a negative effect on

Table 10 Summary of results with respect to hypotheses tested

H1: A positive relationship exists between HRM outcomes and organizational performance							
H2: A positive relationship exists between HRM systems and HRM outcomes							
H3: A positive relationship exists between HRM systems and organizational performance							
H4: Increases in HRM outcomes mediate the relationship between HRM systems and organizational performance							
	<i>H3</i> Overall organizational performance	<i>H2</i> Skills	<i>H2</i> Attitudes	<i>H2</i> Behaviours	<i>H2</i> Overall HRM outcome	<i>H1</i> Overall organizational performance	<i>H4</i> Overall organizational performance
<i>HRM outcomes</i>							
Skills						yes(+)	yes(+)
Attitudes						yes(+)	yes(+)
Behaviours							
Overall HRM outcome						yes(+)	yes(+)
<i>HRM systems</i>							
Resourcing and development	yes(+)	yes(+)	yes(+)	yes(+)			yes(+)
Reward and relations	yes(+)	yes(+)	yes(+)	yes(+)			yes(+)
Overall HRM system	yes(+)				yes(+)		yes(+)

organizational performance and on HRM outcome, with emphasis on attitudes. Although this result may look strange, in fact it is not so if we consider that since people are one of the most costly resources affecting the business equation, the conventional wisdom in manufacturing had been to control costs by either reducing the amount of human capital needed in the production process, or suppressing the wage levels (Youndt *et al.*, 1996), or employing people with lower skill levels and decision-making capabilities (Majchrzak, 1988), or putting less emphasis on employee training and development (Schuler and Jackson, 1987). In the case where the employed people will have lower skills, it is obvious that this will have a negative impact on organizational performance. In the cases of either reducing the levels of employment and/or the levels of wages, this will bring labour unrest in the organization that will negatively affect attitudes of employees, with a negative corresponding impact on organizational performance. This discussion may be validated by the negative sign of the cost variable in Model 7b in Table 9, indicating that the introduction of a cost strategy lowers the attitudes (motivation, commitment, satisfaction) of the employees.

Furthermore, we also found that if the organization puts emphasis on the innovation business strategy, this will have a positive impact on organizational performance, while the quality business strategy does not seem to affect either organizational performance or HRM outcomes.

In terms of mediation, we found that human resource management outcomes (HRMO) partially mediate the relationship between human resource management systems (HRMS) and organizational performance (OP). The analysis has produced some interesting conclusions that wholly support or partly support the various hypotheses of the study. Table 10 summarizes the results with respect to the hypotheses tested. The results show that the overall HRM outcome positively affects organizational performance, thus supporting Hypothesis 1. Furthermore, it is seen that employee skills (cooperation between management and employees, cooperation among employees, right mix of employees) and attitudes (motivation, commitment, satisfaction) positively affect overall organizational performance, thus partially supporting Hypothesis 1. This finding demonstrates that the relationships between HRM systems and organizational performance may be mediated by HRM outcomes such as employee skills and attitudes. This finding coincides with Doty and Delery (1997) and Park *et al.* (2003), who argued that HRM policies influence organizational performance by creating a workforce that is skilled and has the right attitudes. It also partially supports Guest (2001) for satisfaction and commitment, Boselie *et al.* (2001) for satisfaction and motivation, and Paul and Anantharaman (2003) for competence and commitment, who argued that these HRM outcomes affect organizational performance.

For HRM outcomes to mediate between HRM systems and organizational performance, HRM systems (resourcing-development and reward-relations) must affect organizational performance (see Hypothesis 3). Findings in Table 10 show that both HRM systems of resourcing-development and reward-relations positively affect organizational performance, thus, supporting Hypothesis 3.

Similarly, for HRM outcomes to mediate between HRM systems and business performance, HRM systems must also affect HRM outcomes (Hypothesis 2). Findings in Table 10 show that the HRM systems of resourcing-development and reward-relations positively affect HRM outcomes, thus supporting Hypothesis 2. Specifically, it is generally accepted that according to human capital theory (Becker, 1964) higher employee skills or competences (Flamholtz and Lacey, 1981; McKelvey, 1983) lead to greater capabilities (Wright *et al.*, 1994) of the pool of human capital under the firm's control (Wright and McMahan, 1992) in developing more efficient means of

accomplishing various tasks in the organization. However, although HRM policies are the mechanics through which employee skills can be developed (Park *et al.*, 2003), skills without synergy or cooperation of the resources that own these skills may not lead to the desired organizational performance (Paul and Anantharaman, 2003). Thus, the right mix of employee competences and cooperation of employees generally define the so-called 'employee skills' (Richardson and Thompson, 1999).

In order to develop employee skills, organizations implement various HRM policies. Although recruitment may be a valid measure for obtaining employee skills this is not the only one (Delery, 1998). It is argued, for example, that apart from effective recruitment, employee skills are positively related with effective training and development. It is widely recognized that training and development assist employees in keeping and extending their knowledge and skills (Boxall, 1996; Marchington and Grugulis, 2000; Pfeffer, 1998). Furthermore, it is argued that satisfactory incentives, such as performance related pay, may encourage employees to gain skills for higher performance (Lado and Wilson, 1993; Latham and Wexley, 1981; Park *et al.*, 2003; Paul and Anantharaman, 2003; Snell and Dean, 1992). Moreover, effective training and communication may enhance cooperation among employees (Mishra and Mishra, 1994), and thus skills.

It is also argued that cooperation between management and employees is positively related to effective recruitment, separation, training, incentives and communication. Cooperation among employees is positively related to effective recruitment, training, monitor training and communication. The right mix of employee competences is positively related to effective training, careers, performance appraisal, incentives and communication. Moreover, with respect to the right mix of employee competences, proper career development programmes will help ensure that employees possess the right mix of skills, and will most probably have a positive effect on the level and type of skills and knowledge in an organization.

In order to bring lasting and better results and to contribute significantly to the success of their organization, employees must be motivated, committed and satisfied (e.g., Mowday, 1998; Paul and Anantharaman, 2003). It is argued that employee characteristics such as employee skills do not provide value to the organization unless they are embedded through proper employee attitudes (Wright *et al.*, 1994; Park *et al.*, 2003), and, furthermore, it is the employee attitudes that determine to what extent employees are prepared to use effectively their various capabilities for the benefit of the organization (Schuler and Jackson, 1987).

Unless the organization is able to retain its employees, it will not be able to capitalize on the human assets developed within the organization. Thus, turnover and absenteeism may have a negative impact on organizational effectiveness, or respectively employee retention and employee presence may have a positive impact on organizational effectiveness (d'Arcimoles, 1997; Arthur, 1994; Boselie *et al.*, 2001). The influence of HRM policies on behaviours may be either direct or indirect through attitudes. For example, Huselid (1995) found that motivation has a negative impact on turnover. In our case it is seen that the HRM systems of resourcing-development and reward-relations are positively related to employee behaviour lending support to Hypothesis 2.

Having produced arguments with respect to the possible mediating variables, we show in Table 10 that the HRM outcome partially mediates the relationship between the human resource management system and overall organizational performance. Furthermore, it is seen that the HRM outcomes of skills and attitudes partially mediate the relationship between the HRM systems of resourcing-development and reward-relations, and organizational performance, lending partial support to Hypothesis 4.

Conclusions

Although past research has demonstrated that there exists a relationship between HR practices and organizational performance, it has neglected to investigate the mediating mechanisms, usually called the 'black box', through which HR policies are hypothesized to affect organizational performance (Park *et al.*, 2003). The results of this study support that the systems of HRM policies positively affect the organizational performance of Greek manufacturing companies. Specifically, the relationship between the HRM systems of resourcing-development and reward-relations and organizational performance is mediated through the HRM outcomes of skills and attitudes. Thus, this paper not only supports that HRM systems have a positive impact on organizational performance, it also explains the mechanisms through which HRM systems improve organizational performance and does so in a non-US/UK context, where most of research related to this field has been conducted.

The two HRM systems of resourcing-development and reward-relations are measured as two systems of mutually reinforcing HRM policies rather than individual policies. Furthermore, the two HRM systems, having the features of distinctiveness and consistency, are positively related with the HRM outcomes of skills (right mix of properly cooperated employees), attitudes (motivation, commitment, satisfaction) and behaviours (retention, presence). Moreover, the two HRM systems influence organizational performance via employee skills and attitudes.

The conclusions above, nonetheless, should be treated with caution. This is mainly because a single respondent from each organization provided information on HRM policies and practices, HRM outcomes and perceived measures of organizational performance, so respondent bias may have occurred in the form of upward or downward reporting of the measures (Paul and Anatharaman, 2003). In spite of such limitations, the study makes some important contributions. It tests theoretical assumptions in smaller firms and in a non-USA/UK context. It provides support to the mediation perspective. The study supports the use of HRM outcomes (skills, attitudes, behaviours) as mediating variables between HRM policies and business performance. Thus, the research suggests that models depicting direct relationships between HRM policies and business performance may be too simplistic and does not show the causalities involved. This meets the advice of Becker and Gerhart (1996) and Guest (1997) to test models with mediating variables such as HRM outcomes.

The argument that HRM makes an impact on the bottom line may not be in dispute. However, what is of interest is in knowing how this impact has taken place. Thus, a managerial implication of this study is not only the demonstration that HRM policies are positively related to organizational performance in the Greek context, but also that employee skills, attitudes and behaviours are three major components of the 'black-box' that generate organizational competitiveness from HRM policies. Managers should recognize that changes in employee skills, attitudes and behaviours that are caused by HRM policies precede changes in organizational performance.

Considering the limitations of the study, we propose paths for future research. Specifically, in this study we tried to explore the question of causality using cross-section data. However, causality can only really be tested with data collected at different points in time. Thus, the field would greatly benefit from some time-series studies in the future. Furthermore, in identifying the impact of HRM systems on organizational performance we used the statistical methodology of regression. However, this methodology assumes that there is a direct causal relationship from HRM systems to organizational performance. Further research is needed to investigate the theory behind this causal relationship. Lastly, considering the pace of globalization, there is a strong need for such investigations in emerging markets.

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