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HUMAN RESOURCES STRATEGIES, COMPLEMENTARITIES, AND FIRM PERFORMANCE[1]

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Abstract: The role of complementarities or synergies among the elements of a firm's system for managing people, and between this system and the firm's competitive strategy and operational goals, are important dimensions of the theoretical explanation for a human resource management (HRM)-firm performance relationship. Prior empirical work, however, has found very limited support for such relationships. This research extends the analysis of complementarities to the supporting "organizational logic" that would be expected to leverage a high performance HRM system. Drawing on a sample of more than 500 firms from a multi-industry national survey we find that a high performance HRM system has an economically and statistically positive effect on firm performance. Moreover, based on a cluster analysis, we find that firms can be distinguished by the way they complement their HRM systems with a supporting organizational logic. Compared to the more traditional "Personnel" strategies, both an integrated High Performance HRM strategy and a Compensation-focused strategy are associated with significantly higher firm performance. Finally, we show that the Compensation-focused strategy gains are largely attributable to internal fit, while the incremental gains from the integrated High Performance HRM strategy are largely due to complementarities from external fit.

The nature and pace of recent changes in the economic environment have motivated both managers and scholars to look for new sources of competitive advantage and profitability. As many of the traditional sources of competitive advantage (technology, economies of scale, patents, etc.) have diminished in value, the role of a skilled, motivated, and flexible workforce has become more prominent (Pfeffer, 1994). The form and structure of organizational policies and practices that might produce such a work force, and in turn have an economically meaningful effect on firm performance, has been the focus of a developing literature in strategic human resource management (HRM)[1]. The result has been an emerging consensus that a broadly defined *High Performance Work System* (HPWS) can be a key strategic lever, both as a means to develop and sustain core competencies and as a necessary condition for strategy implementation (Dyer, 1993; Levine, 1995; Pfeffer, 1994). Such systems include rigorous recruiting and selection protocols, performance management and incentive compensation systems, and employee training and development activities that are designed to acquire, refine, and reinforce employee skills and behaviors necessary to implement the firm's competitive strategy (Huselid, 1995).

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Despite the strong empirical support for a HPWS-firm performance relationship, much of the prior work is limited to organizational success at the plant and unit level (Arthur, 1992; Ichniowski, Shaw, & Prennushi, 1997; MacDuffie, 1995; Youndt, Snell, Dean, & Lepak, 1996). There are very few published studies that focus on firm performance at the level of the organization and reflect the fundamental financial influence associated with a strategic role for HRM (Delery and Doty, 1996; Huselid, 1995; Huselid & Becker, 1996a; Huselid, Jackson & Schuler, 1997). While estimates of the HRM-performance relationship at various levels of the organization provide important support for this thesis, the ability to demonstrate the impact of HRM on the firm's bottom line remains a principal challenge in this literature. This study extends this empirical literature by providing a more comprehensive test of the HPWS-firm performance at the level of the firm. Utilizing a new data set, the paper also addresses a recurring theme in this literature; namely, the role of fit, contingencies and complementarities in the HRM-firm performance relationship. While prior work has provided mixed support for the existence of complementarities at the unit and plant level (Ichniowski et al.,1997; MacDuffie, 1995; Youndt et al., 1996) evidence of such contingencies is even more limited at the level of the firm (Huselid, 1995; Huselid and Becker, 1996b).[2]

Drawing on theoretical work emphasizing the strategic role of organizational capabilities (Barney, 1991; Ulrich and Lake,1990), we extend the analysis of the HRM-firm performance relationship to the larger "organizational logic" (MacDuffie, 1995) that complements and supports the implementation of a HPWS. We argue that complementarities between the HRM system and other organizational policies required to leverage the HRM system and implement a given strategy are an important missing element in the HRM-firm performance nexus at the level of the firm. A professionally developed HRM system is the foundation for a strategic impact for HRM. Building organizational capability, however, implies that these systems be implemented in a context that supports a strategic role for HRM (Ulrich and Lake, 1990) including leadership by line and HR managers that reflects this role. It is the combination of the high performance HRM system and the supporting implementation alignment that represent "idiosyncratic contingencies" (Becker and Gerhart, 1996) that serve as a potential inimitable foundation for effective strategy *implementation* (Barney and Hesterly, 1996) and, consequently, superior firm performance. Consequently, this paper is organized around three research questions.

1) Do the HRM *system* and *supporting organizational logic* have independent and economically significant effects on firm performance?

2) Are there incremental gains from *internal fit* within these two dimensions of HRM strategy?

3) Is there an optimal *alignment* between these two dimensions of a firm's HRM strategy that improves firm performance beyond the levels observed for alternative HRM strategies?

Elaborating on the role of contingencies and alignments that can serve as strategic assets is at the center of these questions. The first question incorporates direct measures of implementation alignment, the organizational logic designed to leverage a high performance work system. The second focuses on internal alignments within each dimension of the HRM strategy, while the third examines not only whether different alignments exist in practice, but more importantly whether such differences have implications for firm performance. Based on multiple tests, our results indicate that both internal and external fit does matters. It is by no means the entire explanation for the HRM-firm performance relationship, however, and the nature of the influence varies across HRM strategies.

THEORETICAL BACKGROUND AND HYPOTHESES

The prior conceptual literature speaks both to the mechanism through which the HRM system might affect firm performance as well as the necessary conditions for these systems to have a strategic impact. The *behavioral* perspective (Jackson, Schuler, & Rivero, 1989) argues that a HPWS will acquire, develop and motivate the behaviors necessary to enhance firm performance (Bailey, 1993; Jackson et al., 1989; Pfeffer, 1994; Schuler & MacMillan, 1984). The impact of these systems is magnified when the component policies reinforce one another (internal fit) and in turn directly support the implementation of the firm's competitive strategy (Butler, Ferris, & Napier, 1991; Cappelli & Singh, 1992; Jackson & Schuler, 1995; Milgrom & Roberts, 1995; Ulrich & Lake, 1990; Wright & MacMahan, 1992). In essence, prior theoretical work in this area concludes that competitive advantage is in part a product of HRM systems that elicit employee behaviors consistent with the firm's broader strategic and environmental contingencies (Jackson & Schuler, 1995).

Promoting desirable employee behaviors, however, is not sufficient to create a strategic influence for HRM. Following the *resource-based view of the firm* (Barney, 1991) it is clear that if HRM systems are to in fact contributing to a sustained competitive advantage, they must be difficult to imitate. HPWS are characterized by at least two features that are associated with inimitability: path dependency and causal ambiguity (Collis and Montgomery, 1995). Path dependency describes organizational resources that are developed over time and cannot be simply purchased in the market by competitors. A competitor can understand that a particular policy or practice is valuable and would like to adopt it, but is precluded from immediate imitation by the time required to fully implement the strategy. Causal ambiguity reflects policies that are easily understood in concept, but in practice require numerous and subtle interrelationships that are not readily observed by those outside the firm. An example is the challenge of aligning HRM policies with the implementation demands of a firm's strategy at different levels of the organization and their larger "embeddedness" in management practice (Lado & Wilson, 1994; Lengnick-Hall & Lengnick-Hall, 1988).

The *behavorial perspective* describes how the HRM system creates new firm capabilities, while *resource-based view* emphasizes the attributes required for these capabilities to generate competitive advantage. Complementarities within the HRM system, as well as the alignment of the HRM strategy with appropriate business strategies and goals, provides a theoretical rationale for a positive link between HRM and firm financial performance. This notion reflects theoretical work in the field of strategic management (Amit and Shoemaker, 1993) that develops the concept of *strategic assets* as "the set of difficult to trade and imitate, scarce, appropriable, and specialized *resources* and *capabilities* that bestow the firm's competitive advantage" (pg. 36). Our view is that HRM strategies that successfully develop and implement a coordinated HPWS create "invisible assets" (Itami, 1987) that both create value and are difficult to imitate. These asset values are maximized when the HPWS is so embedded in the operational systems of the organization that it enhances a firm's *capabilities* to solve business problems that prevent effective strategy implementation. Therefore, unlike more traditional "personnel" activities, HPWS have a strategic impact at the level of the firm because they provide a competitive advantage in the implementation of the firm's strategy. This interpretation is also consistent with the emphasis on "core competencies" developed by Hamel and Prahalad (1994) who argue that conventional measures of economic rents such as the difference between market and book value of assets (i.e., Tobin's *q*) reflect "core competence, (or) people embodied skills" (pg. 232). A HPWS is one of the key foundations for the development of such intellectual capital.

As Ulrich and Lake (1990, p. 40) conclude, "at its most fundamental level organizational capability is the ability to manage people for competitive advantage." The foundation of this organizational capability is a HPWS that is not easily imitated by its competitors. The logic of inimitability has motivated a focus on complementarities (Milgrom and Roberts, 1995) and "bundles" or systems (Arthur, 1994; Huselid, 1995; Ichniowski, Shaw, & Prennushi, 1996; Jackson & Schuler, 1995; MacDuffie, 1995) rather than the emphasis on individual HRM policies and practices that characterizes much of the traditional HRM literature. Research on complementarities has focused largely on the internal alignment of elements within these systems, or the external alignment with the firm's competitive strategy (Becker and Gerhart, 1996). However, just as strategy *implementation* is now considered to be as important to firm performance as strategy *content* (Pfeffer, 1998), the associated organizational policies, practices and capabilities required to *implement* a high performance HRM system are an important complement to such a system, and an important feature of the causal ambiguity that is the foundation of a competitive advantage. MacDuffie (1995), for example, refers to the "organizational logic" that combines a system of manufacturing practices with a system of HRM practices required for flexible production at the level of auto assembly plants.

One of the purposes of this paper is to explore the broader "implementation alignment" of policies and practices that an entire firm might develop to leverage a HPWS as an influence on firm performance. This can be thought of as a form of organizational capital (Barney, 1995) combining both the necessary *competencies* and supporting organizational resources or "logic" to implement a strategy that competes on the quality of its workforce. The necessary competencies would focus on those HRM elements required to effectively implement a high performance work system. The corresponding organizational logic would include not only the alignment of HRM strategies with larger business strategies, but also the leadership style and support required by a high performance HRM strategy. For example, a firm characterized by an effective HR function, a culture that values employees as more than a cost to be minimized and the requisite top management support, might use their compensation and performance management practices as effective tools to help implement competitive strategy. By contrast, another firm with ostensibly the same HRM system, may be constrained in the implementation of this system by an ineffective HR function, poor communication of the firm's mission and a limited role for HR as a business partner with line managers. We argue that implementation alignment is another strategic asset that can enhance firm performance. Together with a HPWS, implementation alignment supports the development and utilization of "tacit knowledge" (Spender and Grant, 1996) which creates value and is difficult for competitors to imitate.

The preceding discussion implies several hypotheses. First, we argue that human capital is an increasingly important driver of firm performance and the foundation for creating this human capital is a high performance work system. Therefore,

> **Hypothesis #1:** A more comprehensively deployed HPWS will be positively associated with corporate financial performance.

Second, following MacDuffie (1995) we suggested that the concept of alignment and complementaries should be extended to the range of organizational policies and practices (organizational logic) that support and leverage a HPWS. Therefore, we would expect:

> **Hypothesis #2**: Organizations with a comprehensively deployed HPWS will be more likely to be characterized by the organizational logic necessary to implement a high performance HRM strategy.

In other words, if firms actually consider their HRM systems to be a strategic asset, we should also expect those same firms to be more likely to adopt the necessary organizational logic to fully implement this HRM strategy.

A corollary of interest, given Hypotheses 1 and 2, is whether we should expect the type of organizational policies and competencies identified as complements to the HRM system to have an independent effect on firm performance. Recognizing that the constituent elements of this construct are themselves generally considered to enhance performance we expect:

> **Hypothesis #3**: The organizational policies and practices that complement a HPWS will have an independent positive effect on firm performance.

We consider Hypothesis 3 a more tentative hypothesis than Hypothesis 1 because of the complementary role predicted for these policies.

Finally, the literature is clear that complementarities should exist when the HRM system and supporting organizational logic are both *internally* aligned. In addition, where firms align a high performance work system with an appropriately structured organizational logic (external fit) they will have an additional improvement to firm performance that goes beyond what would have been predicted from the simple additive effect of these two aspects of the HRM strategy. Therefore,

> **Hypothesis #4:** Internal alignment of the HRM system will produce incremental positive effects on firm performance

> **Hypothesis #5:** Internal alignment of the supporting organizational logic will produce incremental positive effects on firm performance

> **Hypothesis #6:** A fully deployed HPWS and an organizational logic aligned with the requirements of a HPWS will create a synergistic effect that will be reflected in firm performance.

METHODS

Sample and Data Collection

This study draws on data collected in 1996, and focuses on the HRM systems and strategies of firms in calendar year 1995. The sample was drawn from *Compact Disclosure*, a commercial database comprised of annual corporate 10-K filings[3]. The sampling frame consisted of all publicly-held domestic firms with more than 100 employees and $5 million dollars in sales, and comprised 3,840 firms. After extensive pretesting and piloting of all survey materials, data on firm HRM systems were solicited from the chief HR officer in each firm. 702 respondents completed questionnaires, for an overall response rate of 18 percent. This response rate is consistent with the levels reported in similar studies using mailed surveys (Delery and Doty, 1996; Huselid, 1995; Youndt et al., 1996). Comparisons between firms in the sample and those in the sampling frame indicate no meaningful differences in terms of firm size or industry distribution.

For items focusing on general HRM practices, informants were asked to respond separately for exempt and nonexempt employees, indicating the proportion of employees in each category who were affected by each practice. To derive a measure of the degree to which the practices were used by a particular firm, responses to each question were weighted by the proportion of employees in the exempt and nonexempt categories and summed. Survey responses were then matched with financial data taken from *Compact Disclosure*. Substantial care was taken to ensure that all data were matched to the same accounting periods. Missing data on some or all variables (primarily firm financial performance) reduced the sample for which complete data were available to 533 observations.

Measures

Financial Performance. The focus in this paper, and indeed the rationale for a firm level of analysis, is that interest in *strategic* HRM is largely motivated by the assumption that a firm's HRM system can provide a source of competitive advantage. The most appropriate measure of such success is the extent to which a firm's market value exceeds its asset base, and we therefore focus on a variant of the familiar Tobin's q as our dependent variable (Hirschey & Wichern, 1984). Tobin's q is a ratio and is typically measured as the natural logarithm of that ratio. However, as a more direct theoretical representation of the strategic import of the HRM system we have incorporated the notion of numerator vs. denominator management described in Hamel and Prahalad (1994). They observe that while the numerator in most financial ratios is the objective for managers whose goal is to create value for their firm, too many managers focus on the denominator (reflecting the fact that increasing the ratio of market to book value can be achieved by *either* increasing market value *or* decreasing book value). Using Tobin's q we cannot separate the effects of HRM on the numerator from the denominator. The latter has typically been the focus of HRM policies in the past where HRM activities are viewed as costs to be minimized rather than value generators. In contrast, the new strategic role of HRM suggests that the effects on these ratios are to expand the numerator rather than to limit the size of the denominator. Since the conventional q measure is the natural logarithm of a ratio we can simply move the denominator to the right hand side of the equation and directly estimate the effects of the HRM system on the market value of shareholder equity.[4]

The potential for simultaneity bias is a common reservation in this literature, the concern being that more profitable firms can afford more of these policies and any positive HRM-firm performance relationship is therefore positively biased. Of course the alternative bias is equally plausible; less profitable firms have a greater need for high performance HRM strategies and are therefore more likely to pursue them. However, there is little theoretical or empirical reason to believe that contemporaneous measures of firm performance pose a fundamental problem. First, prior empirical tests (Huselid, 1995; Huselid & Becker, 1996a; Ichniowski, 1990) have found no evidence of meaningful simultaneity bias in these relationships. Second, many of the elements of a high performance HRM strategy are not inherently more expensive than "low performance" practices. For example, compensation policies that link pay to performance or promotion policies based on merit rather than seniority are not necessarily more expensive than the alternative approach. Third, the elements of the HRM system that we are examining are expected to increase productivity and profitability, and therefore will presumably pay for themselves. We are not focusing on policies that simply reflect greater corporate largesse. Finally, we assume that these policies are not implemented instantaneously and that, in fact, we are observing "equilibrium" relationships. Even though we measure the HRM system in 1995 it does not imply that the system was *implemented* in 1995. In short, the effects of these policies are not observed immediately and probably take several years to influence firm performance. Using contemporaneous measures of firm performance simply assumes that across firm differences are in the HRM systems are relatively stable[5]. If, in fact, contemporaneous "levels" of the HRM system do include recent changes, given prior evidence of an implementation-benefit lag of several years (Huselid and Becker, 1996a), our estimates may actually understate the true effects.

HRM System Measures. The conceptual literature motivating an expected HRM-firm performance relationship emphasizes the role of an interrelated system of practices and policies that forms an inimitable capability for strategy implementation. There is broad consensus that such a HPWS would include rigorous recruitment and selection procedures, performance-contingent incentive compensation systems, management development and training activities linked to the needs of the business, and significant commitment to employee involvement (Arthur, 1994; Huselid, 1995; Ichniowski, Shaw, & Prennushi, 1997; Jackson & Schuler, 1995; MacDuffie, 1995; Milgrom & Roberts, 1995; Pfeffer, 1994). A systems perspective approaches the entire HRM system as one bundle of integrated practices intended to make the labor force a strategic asset rather than a cost to be minimized. While such a perspective would in principle be appropriate at any unit of analysis, it is particularly applicable at the level of the firm. Indeed, more narrowly defined practices that might be appropriate for a particular line of business or occupational group are to be avoided if the measure is to be generalizable across the entire firm and multiple industries.

Not surprisingly, the conventional practice in prior empirical work has been to use a single index that combines multiple HRM practices into one measure (Arthur, 1992; Ichniowski et al., 1997; MacDuffie, 1995; Youndt et al., 1996). While confirmatory factor analysis has been used to validate multiple items measuring the same type of practice (Youndt et al., 1996), Huselid (1995) is the only published study that factor analyzed all of the HRM practices in an effort to identify an underlying set of dimensions for the HRM system. Subsequent work by Huselid and Becker (1996a; 1996b) has shown that the two dimensions reported in Huselid (1995) have equivalent effects on firm performance and when combined into one HRM system index provide very robust results across multiple data sets.

We agree with the extant practice in the empirical literature that a theoretically motivated index is the more appropriate measure of the HRM system. First, a single index reflects the notion of a single HRM system as a strategic asset. Second, since the typical index is a summation of individual elements of the HRM system, it implies that within the broad middle range of the measure there are multiple ways to increase the value of the index. A strong emphasis on one or two policies will have the same index value as more modest attention to a wide range of policies. While an index does not explicitly test such equifinality, it is flexible enough to allow for it.

Conceptually, since idiosyncratic fit would suggest considerable flexibility across firms in the emphasis given to different aspects of the HRM system, an index measure would be a more appropriate reflection of this phenomenon.Following our theoretical focus on the HPWS and implementation alignment, we developed two indices to reflect these constructs. The first, an index of the HRM "system," was constructed from the mean of 24 standardized questions that focused on the intensity with which HRM policies practices generally considered high performance work practices (Arthur, 1992; 1994; Huselid, 1995; Huselid and Becker, 1996b; MacDuffie, 1995; Osterman, 1994; Youndt et al., 1996) have been adopted throughout the firm. This scale (HRM System) had a Cronbach's alpha of .71. A list of these questions and descriptive statistics are provided in Table 1.

The Implementation Alignment measure is designed to reflect the organizational policies and practices that, by complementing a high performance HRM system, create a strategic asset. Based on a review of the literature, Collis (1994) divides such organizational capabilities into three categories: functional proficiency, adaptability and strategic insight. Functional proficiency is represented by the effectiveness of the HRM function in implementing a high performance HRM system. Adaptability of an HRM strategy is represented by the alignment of that strategy with the larger corporate strategy of the firm. Strategic insight focuses on the role of senior management in recognizing the intrinsic value of organizational resources, in this instance providing a leadership style that supports a high performance HRM strategy. Implementation Alignment is the mean of the standardized values for 16 questions that broadly reflect this organizational and has a Cronbach's alpha of .90.

nlike prior work (Arthur, 1992; MacDuffie, 1995; Youndt et al., 1996) that depicts two types of HRM systems, we are measuring two different characteristics that can exist simultaneously in the same organization. They should not be considered substitutes, but rather as two separate elements in the portfolio of a high performance work organization. This inference is supported by the results of a maximum likelihood confirmatory factor analysis. The null model combined the two indexes into one factor. The alternative model specified each index as a separate factor and allowed the error terms to be correlated given that we do not consider decisions on the HRM system and Implementation Alignment to be independent. The one factor hypothesis was rejected with a $\chi^2 = 372$; $p < .001$.

Measuring Internal and External Complementarities. The concept of fit and complementarities in this literature have typically relied on interaction terms to support such hypotheses (e.g. Huselid, 1995; MacDuffie, 1995; Delery and Doty, 1996, Youndt et al., 1996), though Becker and Gerhart (1996) note the limitations of this approach. For our measures of both internal and external alignment we rely on more direct tests of the complementarity hypothesis in this literature. As a measure of alignment, interaction terms are not very precise. For example, in our HRM system measure, a 16 way interaction term is largely uninterpretable, in part because higher values on the multiplicative term does not necessarily imply that the HRM system is improving *as a system*.

Table 1
Questionnaire Items and Scale Construction

HRM System (alpha = .71)
For the **five** positions that your firm (or business unit) hires **most frequently,** how many **qualified applicants** do you have **per position** (on average)?

What proportion of all **new hires** have been selected based **primarily** on the results of a **validated selection test**?

What proportion of **nonentry level jobs** have been **filled from within** in **recent (i.e., over the last five)** years?

What proportion of the workforce is **promoted based** ***primarily*** **on merit** (as opposed to seniority)?

What proportion of the workforce is included in a **formal written human resource or staffing plan** that **includes recruitment & succession**?

How many **hours of training** are typically received by a ***new*** **employee** in the ***first year*** of employment?

How many **hours of training per year** are typically received by an ***experienced*** **employee** (i.e., someone employed **more than** one year)?

What proportion of the workforce is **qualified or capable** (either through training or job rotation) to **perform more than one job**?

What proportion of the workforce **regularly receives** a **formal performance appraisal?**

What proportion of the workforce has their ***merit increase or incentive pay*** **determined by a performance appraisal?**

What proportion of the workforce holds jobs where an employee's performance appraisal is *primarily* determined by an **objective measure of individual performance** (e.g., sales, number of claims processed, etc.)

If the market rate for ***total cash compensation*** is considered to be the 50th percentile, what is your firm's **target percentile** for ***total cash compensation***?

What proportion of the average employee's **total compensation** is accounted for by CASH + DEFERRED BONUSES.

What proportion of the workforce is ***eligible*** for **annual** ***cash*** **incentive plans, profit-sharing plans, and/or gain-sharing plans?**

What proportion of the workforce is ***eligible*** for **annual** ***deferred*** **incentive plans, profit-sharing plans, and/or gain-sharing plans?**

If your firm's **actual financial performance** was **50% below** its ***target*** **level**, by what proportion would the ***target*** incentive be ***decreased***?

If your firm's **actual financial performance** was **50% above** its ***target*** **level**, by what proportion would the ***target*** incentive be ***increased***?

What **percentage merit increase** could a ***high performing employee*** normally expect **as a result of a performance review**? PLUS What **percentage merit increase** could a ***low performing employee*** normally expect **as a result of a performance review?**

What proportion of the workforce **owns shares of the company's stock**?

What proportion of the workforce is included in a formal **information sharing program (e.g., a newsletter or regular meetings) that provides information on a wide variety of topics relevant to the business and its operations?**

What proportion of the workforce is regularly administered **attitude surveys**?

What proportion of the workforce holds jobs that have been subjected to a formal **job analysis**?

What proportion of the workforce **participate in Quality of Work Life (QWL), Quality Circles (QC), and/or labor-management participation programs?**

What proportion of the workforce has access to a formal **grievance procedure and/or complaint resolution system?**

Implementation Alignment (alpha = .90)
To what extent does your firm **effectively hire qualified employees?**

To what extent does your firm **structure jobs and work** in a way that **enhances business performance**?

To what extent does your firm provide **employee training** that **effectively enhances business performance**?

To what extent does your firm's **performance management and appraisal system effectively reward employee behaviors that are consistent with the firm's competitive strategy?**

To what extent does your firm **effectively distribute rewards based on individual and team contributions?**

To what extent does management **effectively address chronically poor performing employees?**

To what extent does your firm **effectively communicate important organizational information to employees?**

To what extent does your firm **effectively elicit and act on suggestions and feedback provided by employees** (e.g., though employee surveys and suggestion systems)?

To what extent does your firm **effectively address workforce diversity issues** related to gender, race, age, physical challenge, etc., as an **integral part of its HR strategy**?

To what extent are HR managers throughout the firm viewed by those outside the function as partners in the management of the business and agents for change?

To what extent does your firm make an **explicit effort** to **align business and HR strategies**?

To what extent is the **HR department** involved in your firm's **strategic planning process?**

To what extent is HR (i.e., the people side of the business) seen **primarily** by **senior management** as a **source of value creation** versus a **cost to be minimized** throughout the organization?

How well or poorly does the following statement **describe the executive leadership** in your firm? **They are vision setters**: studying emerging trends, and concentrating on the formulation and communication of basic organizational purpose and direction.

How well or poorly does the following statement **describe the executive leadership** in your firm? **They are sources of motivation and energy for the rest of the organization**: challenging people with new goals, emphasizing company values, and getting people to be enthusiastic.

To what extent does your firm have a **clear strategic mission that is well communicated and understood at every level throughout the firm**?

Instead, we rely on a measure that scores each element of the HRM system or Implementation Alignment index as 1.0 if that elements is at or above the 75th percentile in the sample (High System and High Support). Therefore, a firm where every element of its HRM system was at the mean would have a value of zero, while one in which half of its HRM system was comprised of elements above the 75th percentile would have a value of 12.0. Increasing values of the High System measure unambiguously reflect a system wide improvement in the *high performance* characteristics of the HRM system

This type of analysis, however, provides little insight into whether firms consistently adopt different HRM strategies, other than more or less of the two dimensions, and will tend to obscure the possibility that more than one "high performance" HRM bundle might exist. In short, we would still have little understanding of how firms might combine the HRM system and Implementation Alignment and whether different combinations of those roles have different effects on firm performance. A more comprehensive measure should be flexible enough to incorporate both issues of internal fit within each element of the HRM strategy, as well as external complementarities between them. Therefore, in an effort to further elaborate on the nature of such complementarities we have also incorporated a cluster analysis of these data. The other important advantage of cluster analysis is that it analyzes the data from the theoretically appropriate perspective; namely, at the level of the *system* rather than at the level of the practice. Firms are sorted into groups that use a common mix or bundle of HRM practices and policies. In contrast to factor analysis, which focuses on commonalities across individual HRM policies, the emphasis in cluster analysis is on identifying commonalities across entire HRM strategies.

Following the recommendations of Ketchen & Shook (1996), we performed a cluster analysis of the firms in our sample, grouping firms based on each of the individual items contained in the HRM System and Implementation Alignment indices. Using standardized variables and a variety of clustering algorithms to check for stability in the results, a four-cluster solution was found to provide the best fit to the data. The means of each item by cluster, presented in Table 2.[6]

The firms in our sample combine the HRM system and Implementation Alignment strategies in four different ways. In the Personnel cluster (n = 176), firms are well below average on *both* HRM strategies. These firms have neither developed an HRM system that can build on the skills and motivation of the labor force as a source of competitive advantage, nor have they aligned the remainder of the organizational context with the principles of a high performance work organization. The next two clusters, Alignment and Compensation, occupy the middle range of the cluster results. The Alignment cluster (n = 132) is slightly above average on the variables that comprise the Implementation Alignment index, but has the lowest values on the variables that make up the HRM System index. Alternatively, the Compensation cluster (n = 123) is above average on the HRM system variables, but below average on the Implementation Alignment variables. We refer to this cluster as the Compensation cluster because the primary reason for the high value of the HRM system index in this cluster is the very high values on the compensation variables. These firms rely overwhelmingly on a strong pay-performance link to enhance the performance of the workforce. Finally, the High Performance cluster (n = 266) is well above average on both indices. Table 2 also shows the mean values of the HRM System and Implementation Alignment variables by cluster.

Figure 1

Illustration of Cluster Results

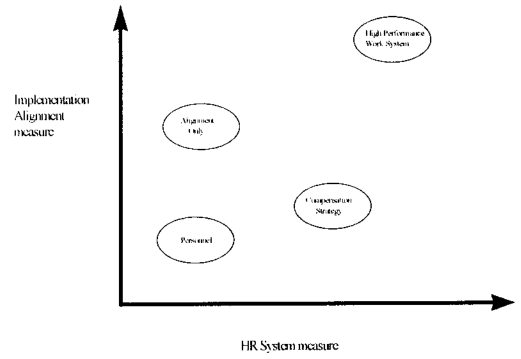

Figure 1 is a simple graphical depiction of the cluster results. It indicates that the High Performance and Personnel clusters could be considered a high/high and low/low combination of the two dimensions of HRM strategy, respectively. The Alignment and Compensation clusters both emphasize just one of the dimensions, but in the case of the Compensation cluster the emphasis is limited to certain elements of the compensation policy

Table 2
Standardized Question Means by Cluster[1]

Question	Cluster 1: Personnel (N = 176)	Cluster 2: Comp. (N = 123)	Cluster 3: Alignment (N = 132)	Cluster 4: High Perf. (N = 266)
HRM System				
Selection ratio	.04	-.08	.37	-.17
Selection testing	-.14	.03	.05	.04
Internal Promotion	-.19	.05	-.37	.28
Merit-based promotions	-.22	.25	-.29	.16
Formal HR plan	-.33	-.12	-.29	.42
Job rotation	-.20	-.16	-.34	.37
Training for new EEs	-.20	.08	-.82	.50
Training for old EEs	-.31	.11	-.85	.57
Total comp. Percentile	-.25	.46	-.23	.06
Cash + Deferred bonuses	-.30	.52	-.20	.06
Eligible for cash bonuses	-.46	.78	-.40	.13
Eligible for deferred bonuses	-.23	.39	-.29	.11
Comp. Decreased with F.P.	-.32	.94	-.60	.07
Comp. Increased with F.P.	-.34	.84	-.45	.06
Performance appraisals	-.34	.33	-.27	.20
Objective perf. Measures	-.38	.31	-.39	.30
Merit incr. By P.A.	-.31	.32	-.22	.17
High - Lo comp. Spread	-.10	.18	-.34	.18
% owning shares	-.23	.32	-.46	.23
Job analysis	-.40	.03	-.21	.36
QWL programs	-.29	-.04	-.29	.36
Grievance procedures	-.11	-.23	-.19	.28
Information sharing	-.53	.36	-.38	.36
Attitude surveys	-.32	-.06	-.39	.45
Implementation Alignment				
Effective hiring	-.53	.05	.06	.29
Effective job structure	-.78	-.11	.15	.50
Effective training	-.76	-.22	-.08	.64
Effective performance management	-.80	-.03	.00	.54
Effective compensation	-.84	.25	-.01	.46
Effective mgt. Of poor performance	-.57	-.22	.25	.36
Effective communication	-.92	.00	.10	.55
Effective suggestion management	-.75	-.29	.04	.61
Link diversity with strategy	-.62	-.30	.33	.38
HR managers are change agents	-.63	-.07	-.02	.45
Align business & HR strategies	-1.10	-.08	.15	.68
HR involved in strategic planning	-1.05	.08	.07	.62
HR seen as a source of value creation	-.88	-.01	.22	.47
Leadership - visionary	-.82	-.30	.32	.52
Leadership - motivate	-.87	-.26	.26	.56
Clear strategic mission	-.99	-.21	.21	.64
Scale Means by Cluster				
Mean HRM System Index	-.293	.206	-.294	.242
Mean Implementation Alignment Index	-.798	-.101	.101	.520

[1] All question means differ significantly ($p<.01$) across cluster categories

. While the absence of a probability theory for cluster analysis rules out a clear test against a null hypothesis that no clusters exist (Barney and Hoskisson, 1990), at least three of the clusters are consistent with the HRM literature. Though it is not clear whether the Personnel, Compensation and High Performance clusters represent an ongoing evolution in the market for ideas, or an equilibrium choice among HRM strategies that seek to compete on the performance of the workforce and those that do not, each of these HRM strategies have been discussed in the literature and observed in practice.

However, while the cluster results are broadly consistent with what might be expected in a multi-industry cross sample, the more important question is whether those clusters are associated with differences in firm performance. In short, the validation of these clusters turns on their relationship with firm performance. Hypothesis 6 predicts that the proper alignment between the HRM System and Implementation Alignment strategies will have a complementary effect on firm performance, therefore we expect the effects of the clusters on firm performance to be ordered as follows: High

Performance>Personnel. While we would expect that the effects of the Alignment and Compensation clusters would fall somewhere in between the two other clusters, we have no *a priori* basis for predicting their relative order. However, if a broader organizational alignment is a necessary condition for HRM strategies to influence firm performance, the High Performance strategy should have a significantly more positive effect on firm performance than these two strategies as well.

Control Variables. Our approach is to explore Hypotheses 1-6 within the conventional models of firm performance that have been well developed in this literature (Huselid, 1995; Ichniowski; 1990) and elsewhere (Hall, Cummins, Laderman, & Mundy, 1988; Hirsch, 1991; Hirschey & Wichern, 1984). The challenge in specifying these models is not to fully explain the dependent variable, but rather to specify the model sufficiently so that we have confidence that our HRM variables are not confounded by the effects of omitted variables. The conventional control variables in such a model include prior firm growth in sales, tangible assets (plant and equipment), number of employees, investment in research and development (normalized by sales), unionization, firm systematic risk (beta), and 34 dummy variables that represent 35 2 digit SIC industry codes.

RESULTS

The descriptive statistics and correlations for all variables are reported in Table 3. The HRM System and Implementation Alignment scales are based on an average of standard scores, hence their means are very near zero.

Table 3
Means, Standard Deviations, and Intercorrelations for all Variables[a]

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	1
1. Ln of market value	12.37	1.79														
2. Ln of book value	11.56	2.01	68													
3. HRM System	0.01	0.37	26	16												
4. Implementation Align.	-0.01	0.62	25	16	54											
5. Personnel Cluster	0.25	0.43	-26	-18	-50	-74										
6. Comp. Cluster	0.19	0.39	03	00	27	-07	-28									
7. Alignment Cluster	0.17	0.38	-02	-01	-37	07	-26	-22								
8. High Perf. Cluster	0 .39	0.49	23	17	51	66	-46	-39	-37							
9. Total Employment	5,635	27798	36	32	05	08	-06	-04	08	02						
10. Union Coverage	9.63	19.39	15	33	-12	-07	06	-07	04	-03	13					
11. R&D/Sales	0.74	.79	-04	-10	06	-05	05	-02	-02	04	-02	-04				
12. Firm-specific risk (beta)	1.07	0.21	-02	-05	07	-03	05	07	-06	-05	-01	-14	00			
13. Growth in sales	0.52	0.79	17	02	08	05	-07	04	-06	08	01	-16	-07	15		
14. High System	8.89	3.61	21	10	84	48	-44	29	-34	42	03	16	00	08	05	
15. High Support	5.79	3.98	20	11	48	90	59	15	02	66	05	09	-01	-02	02	

[a] n = 533. All correlations > = .05 are significant at the .05 level, those > = .07 are significant at the .01 level, and those > = .10 are significant at the .001 level (one-tail test).

Hypotheses 1 and 2

The estimation model is a conventional OLS regression analysis of firm performance with the natural logarithm of market value as the dependent variable (See Table 4). The coefficients are unstandardized and can be interpreted as percentage changes in market value per unit change in the respective independent variable[7]. The results in Model 1 support Hypothesis 1 and indicate that the HRM system index has an economically and statistically significant positive effect on firm performance. In practical terms, a one standard deviation change in the HRM is associated with a 23.3 percent change in shareholder value[8]. The results in Model 2, which includes both HRM variables, are consistent with prior work examining the effects of the HRM system on firm performance (Huselid, 1995; Youndt et al., 1996) though our system measure is more comprehensive than those used in earlier studies. However, replicating the HRM system-firm performance relationship with a different measure in a different time period is important support for these prior empirical results. Model 2 also allows us to test Hypothesis 2 which predicts that Implementation Alignment will have positive independent effect on firm performance. The results support Hypothesis 2. The coefficients on both HRM variables are statistically significant ($p<.01$, one-tailed test) and reflect economically meaningful relationships with firm performance. The effect of the HRM system variable falls by about 40 percent relative to its value in Model 1. This is not surprising given the substantial positive correlation between the HRM system and Implementation Alignment variables. This suggests that in prior research part of the positive effects of the HRM system on firm performance may have reflected the

Table 4
OLS Regression Analysis for the log of Market Value

	1	2	3	4	5	6	7
Constant	5.607*** (0.474)	5.587*** (0.472)	4.818*** (0.473)	5.226*** (0.034)	5.622*** (0.474)	5.126*** (0.473)	5.399*** (0.586)
ln of book value	0.587*** (0.035)	0.583*** (0.034)	0.591*** (0.034)	0.584*** (0.035)	0.583*** (0.035)	0.579*** (0.035)	0.582*** (0.035)
HRM System	0.648*** (0.153)	0.426** (0.177)		0.137 (0.284)	0.435** (0.177)		0.135 (0.282)
Implementation Alignment		0.257** (0.103)		0.243 (0.212)	0.246** (0.105)		0.276* (0.212)
High System			0.054** (0.018)	0.038* (0.029)			
High Support			0.036** (0.106)	0.002 (0.032)			
High Pay							0.083** (0.036)
High Non-Pay							-0.008 (0.036)
HRM System X Implementation Alignment					- 0.136 (0.208)		
High Performance Cluster						0.655*** (0.149)	
Compensation Cluster						0.393** (0.168)	
Alignment Cluster						0.283* (0.170)	
Total Employment	8.47^{e-6}*** (2.06^{e-6})	8.24^{e-6}*** (2.05^{e-6})	8.19^{e-6}*** (2.05^{e-6})	8.13^{e-6}*** (2.05^{e-6})	8.23^{e-6}*** (2.05^{e-6})	8.80^{e-6}*** (2.07^{e-6})	8.01^{e-6}*** (2.05^{e-6})
Union Coverage	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.000 (0.003)	-0.001 (0.003)	-0.002 (0.003)	-0.000 (0.003)
R&D/Sales	0.106* (0.067)	0.107* (0.066)	0.092* (0.066)	0.100* (0.067)	0.113* (0.067)	0.099* (0.067)	0.099* (0.066)
Firm-Specific Risk (Beta)	-0.136 (0.281)	-0.064 (0.281)	-0.079 (0.280)	-0.071 (0.281)	-0.071 (0.281)	-0.069 (0.283)	-0.087 (0.280)
Growth in Sales	0.304*** (0.072)	0.299*** (0.072)	0.304*** (0.072)	0.300*** (0.072)	0.299*** (0.072)	0.286*** (0.073)	0.292*** (0.072)
all models include 35 2 digit industry dummy variables							
Sample size	533	533	533	533	533	531	533
R^2	0.589	0.594	0.594	0.595	0.594	0.589	0.599
F	17.14***	17.05***	17.05***	16.31***	16.65***	16.26***	16.16***

† $p < .10$; * $p < .05$ ** $p < .01$; *** $p < .001$. All significance levels reflect one-tail tests.

effects of other organizational policies that leveraged the influence of the HRM system.

Hypothesis 3

Hypothesis 3 is a corollary of our theoretical discussion of the importance of alignment to the HRM-firm performance relationship. Namely, if there is a synergy between a high performance HRM system and the supporting organizational logic, we should observe some evidence that firms tend to implement both strategies together. The simple result supporting this prediction is a statistically significant correlation between the HRM system and Implementation alignment indices (r=.54; p<.001). The cluster analysis provides additional support for Hypothesis 3 in that a High Performance cluster characterized by above average values on both indices actually exists.

Hypotheses 4 and 5

The results for Hypothesis 3 suggest that Implementation Alignment has effects beyond those that would be limited to a complementary relationship with the HRM system. However, Hypotheses 4, 5, & 6 remain the central focus of this paper because they specifically examine the proposition that complementarities matter. The results in Models 3 and 4 provide evidence that they do. The results in Model 3 replicate Model 2, except that High System and High Support replace the HRM System and Implementation Alignment indices. Recall that the former measures take the value from 1 to k as the ith element in the k-element index exceeds the 75th percentile in the sample. The average firm has 8.9 and 5.8 elements of the HRM System and Implementation Alignment indices at this level, respectively. The coefficients on both of these internal fit variables is statistically significant at conventional levels, but the interesting comparison is the magnitude of their impact on firm performance. For example, if we compare the impact of a one standard deviation change in the HRM variables in Models 1 and 3, we find that the impact of the High System measure is 29 percent larger than the simple HRM system index[9]. A comparable calculation for the Alignment measures indicates that the impact of the High Support measure is 8 percent *less* than the effect of the simple Alignment index. We take this as evidence that internal fit within the HRM system is more important to firm performance than internal fit within the supporting organizational logic, where better fit is defined as a more comprehensive adoption of each element of the system.

This analysis is extended in Model 4, where both simple indices and the fit indices are included in the same model. The previous result provided evidence on the relative impact of internal fit for the two dimensions of the HRM strategy, while the estimates in Model 4 provide an insight into how much of the additive improvements in the system variables are attributable to increasing fit. Sorting these two effects out is a challenge because these versions of each system measure are so highly correlated (.84 to .90). The high collinearity undermines the statistical significance of the individual coefficients, though joint F-tests of the two HRM system measures and Implementation Alignment measures are each significant at conventional levels[10]. While these results are largely exploratory they too provide additional support for the importance of internal fit as a source of complementarities. The change in the effect of the HRM System index between Model 2 and 4 suggests that approximately two thirds of the gains from improving the HRM system comes from increasing the internal fit of the system. The gains from internal fit within the supporting organizational logic, on the other hand, are trivial.

Hypothesis 6

We tested Hypothesis 6 in three ways, two of which provide strong support for importance of complementarities. First, we test for complementarities following the most common approach in prior work in this area (Huselid, 1995; Delery and Doty, 1996; Youndt et al., 1996), by adding a moderator variable (HRM System x Implementation Alignment) to Model 2. These results are reported in Model 5, and provide no support for any complementarities from external fit the two variables. This result is entirely consistent with the overwhelming absence of any broad evidence for the effects of internal or external alignment when "fit" is measured as an interaction term[11].

An alternative approach to capturing any synergies from external fit is to test Hypothesis 6 by replacing the two HRM index variables with the results of the cluster analysis. These results are reported in Model 6. Since each cluster is denoted as a binary variable, the Personnel HRM cluster is omitted from the model. Therefore, the coefficients on the included clusters can be interpreted as the difference in the effects of the ith cluster on shareholder value compared to this omitted group. All three clusters have economically and statistically significant effects on a firm's market value relative to the Personnel cluster. The point estimates indicate that firms in the High Performance, Alignment and Compensation clusters had 65, 28 and 39 percent higher market value, respectively, compared to firms in the Personnel HRM cluster. The coefficient on the High Performance cluster is, moreover, significantly different from the next largest effect, the Compensation cluster. A joint F-test rejects the hypothesis that the two coefficients are equal ($F_{1,487}=2.98$; p=.08). Therefore not only is the High Performance cluster associated with the largest increment in firm performance relative to the Personnel cluster, this performance gap is also significantly different from all other clusters, both economically and statistically.

The advantage of cluster analysis for a test of complementarities is that it does not impose any *a priori* constraints on the nature of either the *internal* bundle of elements within each strategy or *external mix* between the two elements of the overall HRM strategy. For example, instead of the three clusters simply reflecting the same relative changes in the two elements as a firm moves from the Personnel to the High Performance system, the cluster analysis allows for a differential emphasis on the importance on such significant elements as the pay-performance link within the HRM system (the Compensation cluster), as well a range of smaller, but more broad based differences in the internal balance of the elements of the HRM system. While the HRM indices in Model 2 constrain the effects of different bundles to be same for equal index values, the cluster analysis allows us to test that assumption directly when those different bundles represent a systematic pattern of practice and constitute a cluster.

Based on the results in Model 2 and Model 6 we can combine these analyses for an additional test for the presence of complementarities that reflects whether the "whole is greater than the sum of the parts". For example, Table 2 reports the mean values for the HRM System and Implementation Alignment index in each cluster. The Personnel cluster is well below average on both indices, with mean values of -.293 and -.798 on the HRM system and Implementation Alignment variables, respectively. This compares with the High Performance cluster which has mean values of .242 and .520 for the two indices. Using Model 2 the "average" organization could expect to improve its firm performance by 56 percent if it were to move from a Personnel strategy to a High Performance strategy[12]. This is the estimate based on the "sum of the parts". The results in Model 4, however, reveal a 65.4 percent difference in firm performance between the High Performance and Personnel strategies. The nearly 17 percent ([65.4-56]/56) relative difference in these two estimates is further support for Hypothesis 4 and can be interpreted as a synergy between a HPWS and the supporting organizational logic designed to leverage such a system.

The Importance of Compensation Within the HRM System

The results of the cluster analysis suggested that a comprehensive high performance HRM strategy that aligns a high performance HRM *system* with a supporting organizational logic was superior to a compensation focused strategy in terms of the effects on firm performance. Nevertheless, taken as "systems," the cluster results potentially reflect the effects of both internal fit within the two dimensions of HRM strategy and external fit between them. In an effort to disaggregate the source of these differences in effects, we extended our earlier analysis of internal fit to focus specifically on the role of compensation elements in the HRM system. The results for Model 7 strongly support the importance of internal fit within a performance oriented compensation strategy. Model 7 replicates Model 4, except that High System (all HRM system elements above 75th percentile) is divided into two variables: High Pay (the 10 pay elements) and High Nonpay (the 14 non-compensation elements). Recall that approximately two-thirds of the gains from improving the HRM system were associated to increasing internal fit. It is clear from this additional analysis that these gains are entirely attributable to internal fit within the compensation policies[13]. This is also consistent with the relatively lower cluster effects for the Compensation strategy. The benefits of this strategy are entirely driven by the returns from internal fit and do not leverage any supporting organizational policies. Comparing the cluster results for the Compensation strategy with the effect implied by the mean levels of the two underlying dimensions of the HRM strategy for firms in that cluster, unlike the case of the High Performance clusters, there are no additional synergies observed.[14]

DISCUSSION

The principal focus of the paper has been to continue the elaboration of the mechanisms by which an HRM system might influence firm performance. While much of the conceptual literature has emphasized the likely importance of complementarities, prior work has provided very limited support for either complementarities within the HRM system (internal fit) or external to the HRM system. This paper provides some new tests for the presence and benefits of internal fit and also moves in a different direction emphasizing the potential leverage provided by the supporting "organizational logic" we called Implementation Alignment. The analysis proceeded hierarchically testing foundational assumptions, before moving on to a more comprehensive test of the efficacy of a high performance HRM strategy that reflects the impact of both internal and external fit.

First, we found uniformly consistent support for a strong positive relationship between the presence of a HPWS and firm performance. Not only were these estimates always statistically significant, but more importantly the point estimates were economically meaningful. A one standard deviation improvement in the HRM system index (Model 2) was associated with an increase in shareholder wealth of $51,000 per employee[15]. This result is consistent with earlier work that has examined the HRM system-firm performance relationship, but extends that literature by utilizing a much more comprehensive measure of the HRM system.

These results are also important because of what a HPWS represents. An implicit assumption for HRM to be a source of strategic advantage is that employee performance must create value and in itself be a source of competitive advantage. Employee performance has to matter. Our measure of a "high performance" HRM system is not designed to necessarily reflect what is new or faddish, but rather to capture this "performance dimension" of any HRM policy. In some respects the items in our measures may appear mundane, but taken together they represent a comprehensive system designed to attract, develop and reward performance. As our other results suggest, the HRM system is not the only piece of the puzzle, but it is an essential piece. Many of the elements of the HPWS might be considered nothing more than good, professional HRM, and by implication not be expected to have a material effect on firm performance. Our results, however, show that it does. A high performance HRM system matters both because it is implemented as a *system* and because the competitive advantage of such systems have changed over time. Our interpretation is that market imperatives have changed to the point that the outcomes of a "high performance" HRM system have more value than they once did. In short, it is not so much that notions of a high performance HRM strategy reflect radically new elements, though indeed there is greater emphasis on certain components of the mix. Rather, although our data do not allow us to directly test such an assertion, we believe that even had these same approaches been adopted more generally 20 years ago the same effects on firm performance would not have been observed. By implication theory development in strategic HRM should include as much of an emphasis on the value chain between HRM and financial performance as the more traditional HRM focus on the person-system relationships.

Second we report new evidence that provides support for the role of complementarities in the HRM-firm performance relationship. These complementarities took the form of both internal fit within the HRM system, as well as external fit between the HRM system and the supporting organizational logic. Defining internal fit as the implementation of performance enhancing HRM policies, both comprehensively and at a high level, we found that better internal fit accounted for approximately two-thirds of the gains in firm performance associated with a high performance HRM system. Virtually no gains from internal fit were observed for the supporting organizational logic. This suggests considerably more equifinality among these supporting policies since one broadly implemented support structure provides not incremental gain.

Indeed, further exploration of the source of the gains from internal fit within the HRM system revealed that all of the gains stemmed from complementarities within the compensation strategy. In part this may reflect the fact that our HRM system measure includes a relatively large number of compensation elements so that the non-compensation measure of internal fit necessarily compares across multiple functions within HRM (staffing, training, etc.). However, these results also reflect the importance of HRM as a source of strategy implementation. No doubt the most visible signal of what the organizational values is what it is willing to pay for. An internally consistent compensation strategy is not surprisingly the first among equals in communicating those values.

Third, we extend the analysis of complementarities to include both internal and external fit. Drawing on a cluster analysis we find that firms implementing a high performance HRM system are also more likely to adopt the types of other organizational policies that support such a system. While largely foundational, it provides important corroborative support for the importance of complementarities. When we rely on firm experience to empirically test these theories, we implicitly assume that there are some firms that actually pursue these strategies. In other words, if contingencies and fit are important, we ought to actually observe firms that behave as if they are.

More importantly, the cluster analysis results strongly supported our hypothesis that the performance effects of HRM are attributable, in part, to complementarities within the HRM system, as well as the "fit" with a supporting organizational logic. The High Performance cluster which characterized firms that had integrated both of these elements into their HRM strategy provided economically and statistically superior effects on firm performance compared to the other three strategies. A simple test of the incremental contribution of any complementarity was based on a comparison of the cluster effects with the effects that would have been predicted from the underlying component values of the HRM system and Implementation Alignment measures based on Model 2. Firms that take advantage of these complementarities experience a 17 percent greater impact on firm performance.

The results based on the cluster analysis are also entirely consistent with our earlier evidence of the importance of internal fit as the source of the gains from the Compensation Strategy. While economically important, the effect of the Compensation strategy was significantly less than the effect for the integrated HRM strategy. This should not be surprising, if complementarities matter, because the Compensation strategy was not leveraged with a supporting organizational logic. Hence, there was no opportunity for external fit. Indeed if we do a similar analysis comparing the cluster effects for the Compensation strategy with the effects implied by the underlying levels of the HRM System and Implementation Alignment variable, we find there are no complementarities. While this interpretation is *post hoc*, these results are consistent with the theoretical literature that external fit matters.

These results suggests that while a firm's compensation strategy may be the foundation of a high performance HRM system, failure to adopt a more integrated high performance HRM *strategy* comes at some cost. The Compensation strategy significantly contributes to firm performance, but there is an opportunity of even greater improvement. While we cannot test the hypothesis, it may be that rather than the High Performance and Compensation strategies being alternatives, they represent an evolution in the development of a firm's capability to compete based on their human capital. Perhaps the most significant and easiest initial strategic change within organizations is to dramatically strengthen the pay-performance link. This in turn is followed by the more difficult and systemic changes required to move to the High Performance strategy. At the same time, the potential differences in implementation challenges between these two strategies should be given careful consideration in evaluating their influence on firm performance. By focusing on compensation, a firm may be able to enjoy 60 percent of the gains from a high performance HRM strategy with considerably less effort and organizational change.

Implications for Future Research

This research is motivated by the belief that in recent years the management of a firm's human resources has become a strategic consideration for many organizations because of the *potential* influence of HRM on firm performance. Our theories suggest that realizing that potential requires an HRM strategy that effectively capitalizes on a wide range of organizational complementarities. Acknowledging the very limited support for HRM contingencies with corporate strategies in prior research, we have attempted to explicate those complementarities that focus more on strategy implementation rather than content. Future research could extend this work in several directions. The HRM-firm performance link must be more fully explored by theoretically specifying and empirically demonstrating the paths by which HRM strategies drive firm performance. This involves a clearer specification of the relationship between HRM and the development of "invisible assets" (Itami, 1987) that can represent inimitable sources of competitive advantage. There is an increasing focus on the importance of the whole spectrum of intellectual capital ranging from brand values and customer relationships, to R&D and "know how". Indeed, Kogut and Zanders (1992) have suggested knowledge management as an organizational alternative to economic theories of the firm. Knowledge management has received considerable attention lately (Davenport and Prusak, 1998; Teece, 1998) as a key driver of firm performance, and one of most productive areas for future inquiry should be the link between the HRM strategy and the firm's knowledge management system.

Following the focus on strategy implementation, much work needs to be done in validating the significant role HRM must play in implementing a firm's strategic initiatives. Kaplan and Norton (1996), under their *Balanced Scorecard* framework, describe strategy *implementation* as the principle strategic challenge facing most organizations and one in which HRM issues are a key performance driver. They describe a generic model in which the areas of *Learning and Growth* (including HRM related issues) drive the *Business Process*, which in turn drives the *Customer* segment, and ultimately *Financial Performance*[16]. The *Balanced Scorecard* can provide a useful orienting framework for further estimating the effect of HRM on firm performance, and at the same time represents relatively fertile ground for HRM researchers as this element of the *Balanced Scorecard* is reasonably underdeveloped (Kaplan and Norton, 1996, p. 145).

Finally, there needs to be more attention to how the benefits of a high performance HRM strategy are allocated between shareholders and employees. Our work has focused exclusively on the gains to shareholders. To what extent are these gains coming at the expense of employees? To what extent are high performance strategies simply a more productive way to organize and manage human capital, in effect enlarging the pie rather than simply restructuring the pie? If these strategies have enlarged the financial pie, are any of those benefits shared with employees, and in what way? Similarly, casual evidence suggests that many employees are working harder than in the past, but that appropriately structured work/family programs can significantly diminish the some of the associated work-family conflict. In other words, policies that are often not thought of as part of a larger high performance HRM strategy, can support such a strategy and should be evaluated from that perspective as well.

CONCLUSION

In recent years there has been an increasing emphasis on the strategic role of HRM and its subsequent impact on firm performance. Much of this research has focused on HRM practices and policies, and more broadly on HRM strategies. Aside from efforts to identify an HRM-corporate strategy contingency, there has been much less attention given to those other elements of the organizational context that might complement the HRM system. We believe that identifying the range of these complementarities is an important gap in the theoretical and empirical literature. This research has extend the notion of a high performance work system to the broader "organizational logic" that leverages the HRM system's role in strategy implementation. It suggests that complementarities do exist and that they have an economically meaningful influence on firm performance.

Endnotes

1. The relationship between these policies and firm performance has attracted considerable interdisciplinary interest and been the subject of recent special issues in several leading journals (*Academy of Management Journal, Industrial Relations, Journal of Accounting and Economics; Organization Studies*).

2. Gerhart, Trevor, & Graham (1996) argue that such weak empirical support calls into question the entire "synergy" hypothesis suggesting that institutional theory can explain HRM-firm performance relationships with simpler main effects models.

3. These documents are obtained by *Compact Disclosure* from the Securities and Exchange Commission (SEC).

4. For example if,

$$ln(\text{Market value/Book Value}) = f(X), \qquad \text{(a)}$$

where X is a vector of independent variables, the dependent variable can be rewritten as

$$ln(\text{Market value})\text{-}ln(\text{Book Value}), \text{ so (a) is now,}$$

$$ln(\text{Market value}) = f(X) + f\ ln(\text{Book Value}). \qquad \text{(b)}$$

Now *ln*(Book Value) is simply a control variable in equation (b).

5. Prospective ($t+1$ year) measures of firm performance, which are equivalent to the values at time t plus a one year change, would still largely reflect the effects on the time t measure unless the effects of any system changes were immediate.

6. The mean values for each item were significantly different across the four clusters for all 40 items.

7. The exception is In PlantEQ which is a logged value. The coefficient on this term is an elasticity.

8. Throughout this paper we follow Cohen (1994), Schmidt (1996) and Becker and Gerhart (1996) and emphasize the point estimates of effect sizes, rather than statistical significance, as the useful measure of impact or importance. This is a literature with dependent variables that have meaningful natural metrics so that unstandardized regression coefficients can provide effect estimates in dollars.

9. For the impact of the HRM system index we multiply .373 (sd) by .426 (coefficient in Model 2) which equals .158. The impact of the HRM System Fit measure is 3.79(sd) x .0539, or .204. .204/.158 =1.291.

10. The hypothesis that the coefficients on HRM System and High HRM are jointly equal to zero is rejected at $p<.05$ ($F_{2,488}=3.77$). The hypothesis that the coefficients on Implementation Alignment and High Support are jointly equal to zero is rejected at $p<.10$ ($F_{2,488}=2.95$).

11. For a review of this issue in prior research see Becker and Huselid (1998).

12. For example, the change in the value of the HRM System variable is from -.293 to .242. Multiplying this .535 change by the coefficient on HRM strategy in Model 2 (.426) represents a change in the dependent variable of 22.7 percent. Adding the same calculations from the Implementation Alignment variables results in a total estimated increment of 56 percent.

13. Note that the 10 compensation elements are 41.6 percent of the total elements in the system and that .416*.0835=.0345 compared to the .038 effect for High System in Model 4.

14. Compared to the Personnel strategy, the change in the value of the HRM System variable is from -.293 to .206. Multiplying this .499 change by the coefficient on HRM strategy in Model 2 (.426) represents a change in the dependent variable of 21.2 percent. Adding the same calculations from the Implementation Alignment variables results in a total estimated increment of 39.1 percent vs. 39.3 percent implied by the results in Model 6.

15. The sample average market value per worker is approximately $300,000.

16. A similar concept is illustrated in the concept of *learning maps* recently developed at Sears (Rucci et al.,1998)

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