

Relationships Among Environmental Turbulence, Human Resource Management, and Corporate Entrepreneurship

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ABSTRACT

Organizational responses to heightened levels of turbulence in the external environment are examined, with specific reference to entrepreneurship and the human resource management function. Entrepreneurial behavior was found to be related to perceived turbulence in the competitive, labor, and supplier environments. In addition, a relationship is established between environmental turbulence and HRM practices. Results also indicate that human resource management practices are a principal means for facilitating corporate entrepreneurship for organizations operating in turbulent environments. Specifically, linkages between eight HRM practice dimensions and corporate entrepreneurship were found. Managerial implications are drawn, and suggestions are made for ongoing research.

INTRODUCTION

As the external environments of firms become increasingly turbulent, managers are forced to become more externally focused and to consider the longer-term implications of their responses to external developments. Moreover, they must become highly flexible and adaptive in capitalizing on opportunities while deterring threats in the external environment (Hamel and Prahalad, 1993; Webster, 1992). It has been suggested that one of the more effective organizational responses to environmental turbulence is entrepreneurship (Covin and Slevin, 1989; de Chambeau and Shays, 1984; Miller and Friesen, 1984). In this context, entrepreneurship refers to the pursuit of opportunity without regard to resources currently controlled (Stevenson, Roberts, and Grousbeck, 1994). There is growing evidence that firms demonstrating a stronger

entrepreneurial orientation tend to outperform their less entrepreneurial counterparts under conditions of environmental turbulence (Covin and Slevin, 1989; Davis, Morris, and Allen, 1991; Miller and Friesen, 1984).

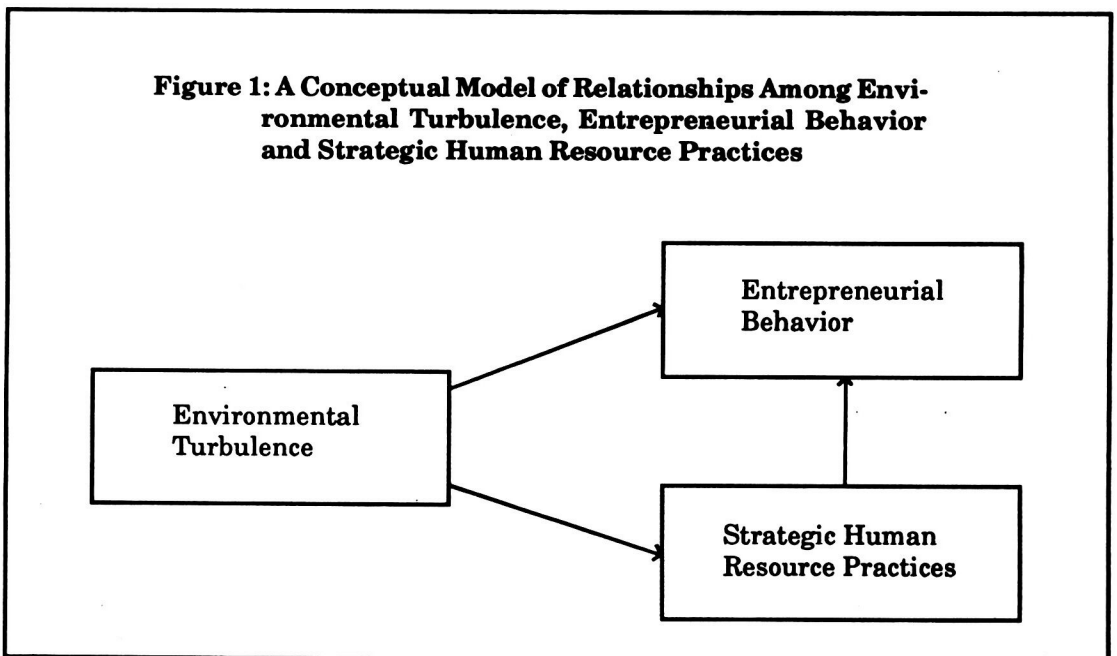
It has also been proposed that human resource management (HRM) can serve a significant role in fostering entrepreneurship within corporations (Schuler, 1986). Certain role behaviors by employees are believed to be more consistent with entrepreneurial performance, such as creativity, independence, risk-taking, and tolerance of ambiguity (Peters, 1987; Pinchot, 1985). Accordingly, it may be possible to identify design options in the firm's recruitment, training, performance appraisal, and other HRM systems which elicit and reinforce these behaviors.

The purpose of the present research is to integrate these various perspectives on the environment, strategy, the HRM function, and entrepreneurship. Based on a synthesis of the available literature, a formal model and a set of research propositions are developed regarding the relationships among these key constructs. Results are reported of a cross-sectional survey of firms in which these propositions are tested. Implications are drawn for theory and practice.

A CONCEPTUAL MODEL

To facilitate this discussion, the conceptual model illustrated in Figure 1 is provided. Here, three sets of linkages are proposed, and each will be elaborated upon below. Environmental turbulence is conceptualized as an external variable which induces strategic adaptation within the firm. While firms respond to external discontinuities in many and varied ways, the two focal response variables are the design of HRM practices, and the amount of entrepreneurship that occurs within the firm. Moreover, turbulence directly affects both of these endogenous variables, but there is also a linkage between HRM practices and entrepreneurial behavior.

Figure 1: A Conceptual Model of Relationships Among Environmental Turbulence, Entrepreneurial Behavior and Strategic Human Resource Practices



Environmental Turbulence, Strategy, and the HRM Function

The most significant challenge confronting corporations today is their ability to cope with unprecedented environmental turbulence. The term "environment" is used here to refer to everything outside the organization, and includes technological, economic, legal/regulatory, customer, competitive, supplier, distributor, and social dimensions. The external environments of firms can increasingly be characterized as dynamic, threatening, and complex (Davis, 1987; Handy, 1990; Hamel and Prahalad, 1993).

The implications of a turbulent environment are many. Managers find themselves faced with shorter decision windows, diminishing opportunity streams, changing decision constituencies, increased resource specialization, lack of predictable resource needs, fragmented markets, greater risk of resource and product obsolescence, and a general lack of long-term control (Stevenson, Roberts, & Gronsbeck, 1994). As a result, some historically successful firms are struggling just to survive, while others are attempting to learn entirely new ways to compete (e.g., Hamel and Prahalad, 1993).

Ongoing turbulence challenges conventional precepts regarding what constitutes effective management. It penalizes those managers who rely on formula-based thinking, conventional rules of thumb, reactive behavior, and traditional planning methods (Bonoma, 1986). Accordingly, the need for "strategic thinking" or "strategic management" has been emphasized. These terms refer to a managerial emphasis on the ongoing search for long-term sustainable advantages over competitors, on serving the evolving needs of carefully defined sets of customers, and on greater flexibility, adaptability, and speed when it comes dealing with change (Bower, et al., 1991).

Strategic management also finds firms assigning responsibility for strategy to those charged with its successful implementation (e.g., Walker and Ruekert, 1987). As such, the strategic thrust of a firm becomes much more the result of functional and interfunctional involvement. One of the key functions in this regard is human resources management. As Balkin and Gomez-Mejia (1987, p. 170) indicate, "Changes in the business environment have made it necessary for top executives to elevate the status of human resource departments and include a human resource management perspective in the formulation of corporate policies." From a strategic management standpoint, improvements in the HRM area are viewed as a means of achieving competitive advantage (Schuler and MacMillan, 1984). Employees are recognized as a valuable source of opportunities as well as limitations, and the strengths and weaknesses of the firm's workforce must be reflected in company strategy. Moreover, once the firm has formulated its competitive strategy, HRM practices become an integral component of strategy implementation.

The set of HRM policies and procedures available to managers includes numerous and varied choice alternatives. Schuler and Jackson (1987) have presented a typology of these alternatives that identifies key decision options in each of six areas: planning, staffing, appraising, compensating, training and development, and labor-management relations. Underlying the various decision options are a number of bi-polar dimensions, which serve as choice options for management. These include the extent to which a given policy reflects an open (closed), formal (informal), long-term (short-term), career (job), external (internal), broad (narrow), results (process), participatory (non-participatory), individualistic (collectivistic), or merit-based (seniority-based) orientation. Schuler (1986) argues that particular organizational strategies can be furthered by putting together consistent sets of these practices.

The linkages between the environment and the HRM function would appear to be both direct and indirect. In terms of the direct linkages, contingency theorists argue that HRM practices must be tailored to reflect the environmental context within which a firm operates. For instance, Balkin and Gomez-Mejia (1987) establish relationships between industry, market, and technological environments, on the one hand, and the effectiveness of various approaches to the design of the firm's compensation system, on the other. The indirect linkages find environmental conditions affecting the firm's choice of overall strategies, which in turn influence the selection of HRM policies. For example, Miles and Snow (1984) discuss the HRM implications of firms pursuing defender, prospector, and analyzer strategies.

The extent to which HRM practices are directly or indirectly affected by environmental developments most likely differs depending on the nature of these developments, and which dimension of the environment is involved. Thus, regulatory changes such as OSHA rulings or those affecting affirmative action, may have a very direct impact on HRM policies. Alternatively, changes in the competitive environment, such as a major merger, might be expected to produce adjustments to the firm's strategy, which then results in new HRM policies.

Hays (1989) suggests the major impact of environmental turbulence has been to raise the strategic importance of HRM, leading to the involvement of HRM professionals in strategic planning and in promoting organization-wide improvements in productivity and quality. He further proposes that environmental change creates a need for more flexibility in the HRM function, as well as more formalization in terms of recruitment, hiring, promotion, and grievance procedures. Such formalization would seem necessary given the need to remedy behaviors deemed discriminatory or harassing, as well as the growing willingness of employees to sue their employers.

Environmental forces (e.g., social, regulatory, demographic, and economic change) also create a need for more diversity in the company's labor force. This, in turn, produces a need for more openness in recruitment and selection (Olian and Rynes, 1984). Wooldridge and Wester (1991) indicate that such forces are also likely to produce HRM practices that are more externally-focused, with broader-career paths, and more individualized approaches to training, performance appraisal, and compensation. Guthrie, et al. (1991) emphasizes that rapid technological changes encourage cross-training of employees, and longer-term approaches to career planning. Changes in the economic, social, and technological environments have also produced increased pressures for individual accountability, which encourages HRM managers to design staffing, appraisal, and reward systems around merit-based criteria (Hays, 1989). Based on the discussion up to this point, the following research proposition can be formulated:

P1. Greater amounts of turbulence in the environment will result in company HRM policies that are more open, flexible, formalized, externally-focused, individualized, merit-based, results-oriented and reflective of a long-term orientation.

Environmental Turbulence and Organizational Entrepreneurship

Entrepreneurship can be defined as "the process of creating value by bringing together a unique package of resources to exploit an opportunity" (Stevenson, et al, 1994). Approached as a process, entrepreneurship has been applied in organizations of all sizes and types, as well as in political and other social contexts (Berry, 1989). Underlying the concept of entrepreneurship are three key dimensions: innovativeness, risk-taking, and proactiveness (Miller and Friesen, 1983). Innovativeness refers to the seeking of creative, unusual, or novel solutions to problems

and needs. Risk-taking involves the willingness to commit significant resources to opportunities having a reasonable chance of costly failure. Proactiveness is concerned with implementation, with doing whatever is necessary to bring an entrepreneurial concept to fruition. It usually involves considerable perseverance and adaptability. Because different degrees of innovativeness, risk-taking, and proactiveness are possible in a particular entrepreneurial event, and any number of such events are possible in a given social context, entrepreneurship can be said to occur in varying degrees and amounts. A given organization can be characterized, then, in terms of the level of "entrepreneurial intensity" that it demonstrates over time (Morris, Lewis and Sexton, 1994).

When the organizational context is a well-established firm, entrepreneurship takes on unique characteristics, and the process becomes subject to a number of opportunities and constraints not found with most independent start-ups. An established firm offers an abundance of resources critical for concept development, testing and implementation. Thus, the corporate individual is not risking his/her own resources, but those belonging to the company. While personal risk is involved, it is more career-related (Kanter, 1983). Further, this individual does not "own" the entrepreneurial concept, and must be prepared to give credit to others within the organizational hierarchy. In addition, there are real limits on the personal rewards, especially financial, that can be earned by the corporate entrepreneur.

de Chambeau and Shays (1984) conclude, "corporate entrepreneurs cannot be assigned or appointed; they must be volunteers who bring a clear vision of what they want to create." And yet, entrepreneurial efforts typically encounter significant external (e.g., technological, economic, governmental, supplier, market) and internal (e.g., cultural, structural, control-related, procedural) obstacles, many of which can only be overcome with sponsorship from one or more senior-level managers, cross-functional teamwork, coalitions, and well-coordinated task integration (Jennings and Lumpkin, 1989; Morris and Trotter, 1990).

It has been argued that a major factor creating the need for entrepreneurial behavior in organizations is turbulence in their external environments. A number of authors have demonstrated a direct relationship between the extent to which firms engage in innovative, risk-taking, and proactive behaviors and company performance (Covin and Slevin, 1989; Davis, Morris and Allen, 1991). Further, there is evidence that this relationship is especially marked under conditions of environmental turbulence. Miller and Friesen (1983) have identified significant relationships between the levels of turbulence and the amount of entrepreneurial behavior in successful firms, but not in their less successful counterparts. Discontinuities in the environment threaten existing modes of operation, accelerating product life cycles and redefining market structures. And yet, the proactive, externally-focused firm finds in such conditions abundant opportunities for creating new products and markets (Hamel and Prahalad, 1993). As a result, the following relationship is proposed:

P2. Greater amounts of turbulence in the external environment will lead firms to become more entrepreneurial in their behavior.

HRM Policies and Entrepreneurship

Different corporate strategies or organizational initiatives require different employee characteristics and behaviors (Gerstein and Reisman, 1983; Miles and Snow, 1984). For each human resource practice there exist design options that are, in fact, options to promote and

reinforce different employee characteristics and behaviors (Schuler, 1986, 1987). For example, using Miles and Snow's strategic typology (1978), Olian and Rynes (1984) proposed that the appropriate mix of recruitment and selection practices is dependent upon whether organizations were pursuing an innovation-based strategy (i.e. prospectors) or more efficiency-based strategies (i.e. defenders).

Entrepreneurial activities require employees to act and think in ways not normally associated with non-entrepreneurial or bureaucratic organizations (Kanter, 1985). Thus, one would expect to observe differences in human resource practices associated with differences in the level of entrepreneurship observed across organizations. Such a view is consistent with contingency theories of organizations and proposals that the "fitting" of an organization's human resource management practices with desired changes in the organization's strategic focus and culture may explain observed differences in human resource practices across organizations (Milkovich, 1988; Lorange and Murphy, 1983; Lawler, 1981).

Based on his review of the literature, Schuler (1986) suggested the following employee characteristics were associated with successful entrepreneurial efforts: creative and innovative behavior, risk-taking, a long-term orientation, a focus on results, flexibility to change, cooperation, independent behavior, tolerance of ambiguity, and a preference to assume responsibility. He also noted that HRM practices are a reflection of a firm's culture, and others (Brandt, 1986; Cornwall and Perlman, 1990; Peters, 1987; Tropman and Morningstar, 1989) have suggested corporate entrepreneurship requires a culture built around emotional commitment, autonomy, empowerment, earned respect, and a strong work ethic. Using these desired employee and cultural characteristics, it becomes possible to identify the HRM policy combinations most conducive to fostering entrepreneurial behavior.

The typology of HRM practices proposed by Schuler and Jackson (1987) is also useful for establishing linkages between HRM and entrepreneurship. To begin with, innovation and risk-taking behaviors would seem more consistent with jobs that are broadly designed, with significant decision-making discretion (Morris and Trotter, 1990; Pearson, 1989). In addition, broad career paths and multiple ladders can provide exposure to different ways of thinking, which in turn promotes idea generation as well as interfunctional cooperation (Brandt, 1986; Macmillan, et al., 1986). Entrepreneurial behavior finds the firm continually entering unfamiliar territory, such that the fit between environmental demands and internal capabilities may require external orientation, including some reliance on external sources for job candidates. Time pressures and variable job requirements are likely to produce a reliance on more open, general, and implicit selection criteria (Olian and Rynes, 1984). Openness is also likely to be important in staffing assignments, as those who engage in entrepreneurial behaviors tend to be self-selected (de Chambeau and Shays, 1984).

Changing job demands and a need to keep abreast of the newest developments in technologies, customer requirements, regulatory restrictions, and so forth imply a need for planned, career-oriented, individualized approaches to training, with high employee participation (Maidique and Hayes, 1984). Because entrepreneurial individuals tend to demonstrate high need for achievement, but are also reward conscious, their active participation also becomes important in the employee appraisal process and the design of the reward system. Entrepreneurial success often depends on the ability of employees to obtain resources in novel or unique ways, and to occasionally violate or ignore company policies. Accordingly, appraisals and rewards are likely to emphasize results over process. In addition, personal incentives become necessary to reinforce the risk and persistence required to implement an entrepreneurial concept (Balkin and Logan, 1988). Entrepreneurship should be encouraged when performance

evaluation and compensation systems are based on long-term results and a balance between individual and group performance. This is because entrepreneurial events take time to evolve, with each one encountering unique sets of obstacles. They also require significant interfunctional cooperation for their successful completion, especially given the technical, financial, marketing and related complications which arise as ventures evolve (Morris, Avila and Allen, 1993; Stewart, 1989). Finally, the considerable ambiguity surrounding these events, combined with the numerous obstacles that arise, suggest that HRM practices must be formally and strategically planned. Given the above, the following proposition can be formulated:

P3. Entrepreneurship will be fostered in companies whose HRM practices are more open, flexible, individualistic, externally-focused, career-oriented, participatory, results-based, merit-based, formal, and reflective of a long-term orientation.

THE STUDY

To further investigate the proposed relationships, a cross-sectional survey of functional managers was conducted. The unit of analysis was the organization, and multiple respondents were drawn from participant firms. The study focused on human resource management practices as they were being applied to mid-level operational managers.

Questionnaire Design

Two survey instruments were developed, one intended for HRM managers, the other for marketing managers. Both were designed as mail surveys. The questionnaire directed at HRM managers was principally concerned with having them characterize the firm's HRM practices. A total of 36 practices in five categories (i.e., planning and job design, selection and staffing, training and development, appraisal, and compensation) were evaluated using 5-point bi-polar scales (see Table 1, next page). These scales attempted to capture the dimensionality reflected in Schuler and Jackson's (1987) taxonomy of HRM practices. For instance, respondents were asked to characterize the extent to which selection and staffing practices rely primarily on internal versus external sources for job candidates, and are based on implicit versus explicit selection criteria. In addition, and as a secondary concern, this questionnaire included an identical version of the entrepreneurship scale described below.

The marketing area within a firm constitutes a boundary function, interfacing with various components of the environment on a regular basis (e.g., customers, competitors, suppliers). As such, perceptions of marketing executives regarding environmental turbulence would seem especially pertinent. The survey sent to marketing managers asked them to evaluate the rate of change in each of seven environmental areas on a five-point scale (not changing at all to a great deal of change). They also indicated how significant the change in each of these areas was for their firm, also on a five-point scale (not at all important to very important). These measures are similar to those used by Miller and Friesen (1983).

It was also assumed that marketing managers would be among those most familiar with any innovative activities directed at the firm's customers (i.e., new products, services, delivery methods, etc.). Accordingly, the second questionnaire asked marketers to characterize the firm's entrepreneurial orientation. This orientation was assessed using the 13-item scale originally developed by Miller and Friesen (1983). Respondents indicated on a 5-point scale the extent to

which each of 13 statements "definitely describes" or "does not at all describe" their firms. Reliabilities reported for this scale, which measures innovativeness, risk-taking, and proactiveness, have ranged from .79 to .88.

Table 1. Summary of HRM Practices Investigated

General Decision Area	Specific Practice Alternatives
Planning/Overall Job Design	Explicit, specific (implicit, loose) job Jobs that emphasize results (processes and procedures) Structured (unstructured) jobs Broad (narrow) jobs Jobs involving significant (limited) discretion Jobs based on bottom-up (top-down)
Selection/Staffing Procedures	Explicit, formal (implicit, informal) selection criteria External (internal) sources of candidates Open (limited) communication of job openings Provision for single (multiple) socialization, orientation for new employees
Performance Appraisals	High (limited) employee involvement, participation Individual (group) performance criteria Emphasis on the way the job is performed (outcomes or end results) Long-term (short-term) performance criteria Encourage (discourage) risk-taking Emphasize innovative (status-quo) behavior High (low) tolerance for failure Appraisals done at supervisor's discretion (fixed time intervals)
Training and Development Programs	High (low) employee participation Individually (group) oriented Long-term (short-term) perspective Unsystematic (systematic) training for managers Emphasis on technical (managerial) training Continuous, ongoing (intermittent, occasional training)
Compensation Practices	Incentives for long-term (short-term) performance Decentralized (centralized) design and control Consistent throughout business (modified to meet functional area needs) Emphasize job security (high pay) Emphasize merit-based (seniority-based) pay increases Emphasize individual (group) performance Emphasize financial (non-financial) rewards Based on subjective (objective) criteria Emphasize effective (efficient) resource utilization Pay based on external (internal) equity or comparisons Low base salary, high incentives (high base, low incentives)

Sampling Method

Questionnaires were mailed under separate cover to the senior human resource manager and to the senior marketing manager in each of 250 firms listed in the *Florida Chamber of Commerce*

Directory of Florida Industries (1992). A stratified sample was employed, where approximately 35 firms were randomly selected from each of seven different industries, including software and data processing, construction and real estate development, electronics/aerospace, general manufacturing, hotels/hospitality, banking/finance, and health care. All firms were located in the Central Florida, and had at least 75 employees. Respondents were sent a personalized cover letter, the appropriate questionnaire, and a stamped, self-addressed return envelope. To facilitate response, participants were promised an executive summary of the results. In addition, pre-notification and follow-up telephone calls were placed two weeks after the mailing.

To be included in the final sample, fully completed surveys had to be received from both managers in each firm. A total of 240 questionnaires were sent to HRM managers, and 133 were received back, for a 55.4% response rate. For the marketing managers, 240 questionnaires were mailed, and 148 received back, for a 61.7% response rate. In 10 of the firms, the same person was responsible for HRM and marketing activities, and 7 of these returned the questionnaire. Of the original 250 firms, 112 generated responses from both the HRM and marketing managers, for a 44.8% response rate. Each of the seven industry groups were fairly well-represented in this final sample.

RESULTS

Refinement of Measures

Principle axis factor analysis was conducted on the 36 HRM items to obtain a more parsimonious set of HRM design dimensions. Eigen values of 1 or greater and screen plot analysis were used to determine the number of resulting factors. The criteria for item retention were: (a) factor loadings of .50 or greater, (b) item stability across rotation methods and (c) contribution to scale reliability. Analysis identified 8 factors explaining 73.4% of the variance.

The 8 dimensions and Cronbach's alpha coefficients for measures of each dimension are shown in Table 2. The dimensions reflect: (1) formality of job planning, (2) customized, career-oriented training, (3) encouragement of innovation and risk-taking, (4) time orientation (short versus long-term), (5) individualism, (6) flexibility in jobs, (7) merit-based evaluation and reward criteria, and (8) a results orientation. In addition, two single item measures which did not load on any of the factors were used in subsequent analysis. These included a reliance on internal versus external sources for employees, and relative use of a fixed versus variable incentive pay mix.

An environmental turbulence index assessing the perceived stability or instability of each environmental component was constructed by multiplying the importance of the environmental component by the perceived amount of change in the environmental component. The turbulence index scores for the seven environmental components were then summed.

An aggregate measure of entrepreneurial behavior was computed by summing together the thirteen item scale developed by Miller and Friesen (1983). Cronbach's alpha was used to estimate the entrepreneurial measure's internal consistency reliability. The alpha coefficient for the HRM and marketing managers were .76 and .79, respectively. Pearson's correlation was used to assess inter-rater reliability among the two groups ($r = .59, p < .01$).

Table 2. HRM Dimensions Identified Through Factor Analysis

<u>Dimension (Label)</u>	<u>Items</u>	<u>Reliability</u>
Dimension 1 (Formality of Job Planning)	Specific/loose job description Structured/unstructured jobs Formal/informal selection criteria	.70
Dimension 2 (Customized, Career-Oriented Training)	Active/passive involvement in training Focus on future/immediate HR needs Continuous/intermittent training	.76
Dimension 3 (Encouragement of Risk-Taking and Innovation)	Appraisals encourage/discourage risk-taking Appraisal emphasize innovative/status quo behaviors	.73
Dimension 4 (Long-term Orientation)	Long/short term performance criteria Long/short term financial incentives	.74
Dimension 5 (Individualism)	Group/individual performance criteria Group/individual reward criteria	.69
Dimension 6 (Open/Flexible Jobs)	Broad/narrow scope Significant/limited discretionary	.76
Dimension 7 (Merit-based Pay)	Merit/seniority-based pay Objective/subject performance criteria	.71
Dimension 8 (Results Orientation)	Emphasizes results/process Appraisals based on outcomes/method	.76

Environmental Turbulence and HRM Practices

Using a median split, the total environmental turbulence scores and the scores for each environmental component (as reported by marketing managers) were divided into less turbulent and more turbulent groups. Multivariate analysis of variance (MANOVA) was used to assess the extent to which HRM practices differed between the higher and lower turbulence firms. The results indicate a significant association between turbulence and differences in HRM practices across organizations ($F = 2.13, p < .05$). When employing this aggregate measure of turbulence, univariate F tests identified a significant difference for one HRM practice dimension. Firms who perceived their total task environment to be more turbulent were found to use job descriptions and performance criteria that emphasized results over process ($F = 3.71, p < .05$).

MANOVA results also indicated that perceptions of turbulence in 6 of the 7 individual task environment components affected HRM practices choices. Significant results were found for the technological ($F = 2.12, p < .10$), economic ($F = 4.48, p < .01$), labor ($F = 3.81, p < .05$), regulatory ($F = 4.38, p < .01$), supplier ($F = 2.21, p < .05$) and customer ($F = 3.52, p < .01$) environments. Univariate F tests in Table 3 (next page) show the effect of the perceived turbulence in each of the seven environmental components on the ten HRM practice dimensions.

Specifically, greater turbulence in the firm's competitive environment was associated with a greater use of group performance and reward criteria and incentive pay. Greater turbulence

Table 3. HRM Practice Dimensions by Environmental Turbulence Components

Environmental Component	Formality	Career Oriented	Risk Taking	Long Term	Individualism	Job Flexibility	Merit-Based	Results	External Focus	Variable Pay
Competition										
p value	0.88	0.93	0.98	0.67	0.33	0.69	0.55	0.01	0.68	0.10
F score	0.12	0.08	0.01	0.48	4.91	0.37	0.60	10.21	0.38	2.84
Technology										
p value	0.77	0.09	0.02	0.03	0.93	0.85	0.02	0.02	0.34	0.01
F score	0.25	2.94	5.50	4.54	0.06	0.15	5.51	5.55	0.98	9.36
Economy										
p value	0.23	0.17	0.04	0.81	0.07	0.54	0.05	0.55	0.61	0.04
F score	1.68	2.08	4.65	0.20	3.79	0.63	3.59	0.62	0.50	3.89
Labor										
p value	0.81	0.05	0.02	0.50	0.89	0.50	0.01	0.46	0.25	0.75
F score	0.21	3.97	5.98	0.74	0.11	0.72	10.17	0.82	1.49	0.28
Governments										
p value	0.91	0.35	0.25	0.64	0.02	0.51	0.20	0.58	0.26	0.23
F score	0.09	1.15	1.56	0.46	6.55	0.69	1.76	0.54	1.51	1.61
Customer										
p value	0.79	0.91	0.81	0.04	0.03	0.87	0.51	0.63	0.79	0.60
F score	0.22	0.04	0.21	4.12	5.12	0.13	0.70	0.47	0.23	0.52
Supply										
p value	0.53	0.78	0.29	0.39	0.02	0.76	0.20	0.78	0.90	0.01
F score	0.66	0.24	1.38	1.03	7.29	0.27	1.78	0.24	0.10	7.97

in the technological environment led to more customized career-oriented training programs, short-term performance and reward criteria, merit-based pay raises, and a greater results orientation. Higher levels of economic turbulence was associated with HRM practices which encourage risk-taking and innovative behaviors, group performance appraisal criteria and the use of incentive and merit-based pay systems. Greater turbulence in the labor market was associated with training programs that focus only on immediate employee needs, performance appraisals which discourage risk-taking and innovation, and pay raises based on organizational tenure. Greater turbulence in the regulatory environment tended to produce a reliance on more individualized performance evaluation and reward criteria. Higher turbulence in the customer environment was associated with the use of short-term and group-oriented performance and reward criteria. Greater turbulence in the supplier environment was associated with a reliance on more individualized performance and reward criteria and having a larger portion of the pay mix made up of incentive payments.

Environmental Turbulence and Entrepreneurial Orientation

Analysis of variance was used to determine if firms differed in their entrepreneurial orientations depending upon whether they perceived their environments to be more or less

stable. The overall relationship was assessed by correlating (Pearson's) the aggregate environmental turbulence index with the entrepreneurial intensity scale. A positive correlation coefficient ($r = .27, p < .05$) was produced. Subsequently, ANOVA results indicated a higher level of entrepreneurial behavior in firms who perceived their competitive ($F = 4.00, p < .05$), supplier ($F = 7.41, p < .05$) and labor market environments ($F = 4.29, p < .05$) to be more turbulent.

HRM Practice Dimensions and Entrepreneurial Orientation

Analysis of variance was next used to determine the extent to which firms that differed in their choice of HRM practices also differed with regard to their entrepreneurial orientation. Results (see Table 4, next page) indicated that differences in HRM practices affected the reported level of entrepreneurial behavior. Specifically, higher levels of entrepreneurial behavior were observed when there was less formality in job specifications and selection criteria. Training tended to be more intermittent and focused on immediate HR needs. Performance appraisal criteria were focused on individual performance, emphasized results and encouraged risk-taking and innovative behavior. Compensation practices tended to emphasize individual performance criteria, merit pay, and a higher base salary with fewer incentives. Finally, a higher level of entrepreneurship was observed when firms placed greater reliance on external sources of job candidates than when they relied primarily on internal sources.

Table 4. Summary of Entrepreneurial Behavior by HRM Dimensions

HRM Dimension	Entrepreneurial Behavior	
	F	p
Formal	48.49	.01
Career-Oriented	14.73	.03
Innovative	53.97	.01
Long-term	3.15	.17
Open, Flexible	.92	.41
Merit-based	34.91	.01
Individualistic	6.19	.08
Results-Oriented	9.48	.05
Externally-focused	6.34	.08
Variable Pay	10.47	.05

DISCUSSION

These findings provide initial support for the conceptual model and prepositions linking the environment, the HRM function, and entrepreneurship. Specifically, environmental turbulence does appear to be associated with the design of the HRM system, and with the relative amount of entrepreneurial behavior in firms. Moreover, entrepreneurship is greater in the presence of particular HRM practices.

While the findings suggest overall turbulence has an impact on HRM practices (i.e., producing more of a results-orientation), it appears that turbulence in the individual components of the environment (e.g., competitive, technological, economic, labor) are more relevant. Although most of the findings were in the directions proposed, there were some notable exceptions. For instance, turbulence in the competitive, economic, and customer environments led to greater emphasis on the group rather than the individual in HRM practices, suggesting the advantages of teamwork are perceived to be more critical than individual initiative under such circumstances. Also, turbulence in both the technological and customer environments produced more of a short-term than long-term HRM orientation, perhaps because firms find their products become obsolete and particular markets dissolve faster than they can adjust. In addition, turbulence in labor markets finds firms discouraging risk-taking and innovation and emphasizing seniority. It may be that an uncertain labor market leads firms to prioritize the need to hold on to existing employees.

To the extent that firms are adjusting their HRM practices to reflect turbulence in the environment, it would seem the HRM function is in fact becoming a more strategic function. While a considerable amount has been written about the need for HRM to become less of a clerical or internally-focused middle management function and more strategic, not much evidence has been produced to suggest this is actually occurring. This elevation of HRM is further reinforced by the apparent tendency for HRM practices to influence levels of entrepreneurial behavior.

Environmental turbulence was also associated with greater levels of entrepreneurship in firms, reinforcing earlier findings. Thus, projections that environments will become increasingly dynamic, threatening, and complex in the years to come indicate a need for managers to become more innovative, risk-oriented, and proactive.

From a managerial standpoint, perhaps the greatest implications lie with the findings regarding the tendency for entrepreneurial behavior to vary as a function of specific HRM practices. Again, most of these were in the directions proposed, but a few exceptions arose. Thus, entrepreneurship is apparently encouraged where the HRM system emphasizes individualism, risk-taking and innovation, a result-orientation, merit pay, and external sources of job candidates, as expected, it was also higher when there was less formality in job planning, and where training was more intermittent and focused on immediate HR needs. These latter two findings may reflect the complexity involved in the entrepreneurial task, such that jobs cannot be precisely specified, and training needs not only become to diverse but they change so rapidly that a short-term approach to training becomes necessary.

While these findings provide direction in terms of where to concentrate efforts when seeking to foster entrepreneurship, the challenge from a managerial standpoint becomes the variable nature of HRM practices and entrepreneurial behavior. Managers must identify desired levels of entrepreneurship, and then determine the corresponding levels of particular HRM practices necessary to achieve the entrepreneurship performance goal. There may be very high levels of entrepreneurship that are dysfunctional from an organizational standpoint. Not only do organizations need to set goals for entrepreneurial behavior, but such goals may need to be based

on expectations regarding environmental turbulence. They may also need to be tailored to individual departments and functional levels. Performance then must be tracked, perhaps using modified versions of the 13-item entrepreneurship scale employed in this study. The emphasis will likely be on product and service innovations in certain areas, and process innovations in others.

Human resource management also provides those interested in corporate entrepreneurship with a number of fertile opportunities for further research. While the current study examined 36 individual practices, there are others that warrant attention, such as the relative emphasis on hierarchical vs. egalitarian compensation, high versus low base salaries, stock options, and perks. Further, it would seem relevant to examine various "packages" of HRM practices. A combined package of selection, training, and appraisal options might have a differential impact on entrepreneurship than the sum of the impacts of the individual practices. In addition, the current study focused on middle-level management. Subsequent work might examine whether the HRM practices that facilitate entrepreneurship differ by level in the firm. Not only will the manifestations of entrepreneurship vary at different levels of the firm, but so too might the impact of relying on internal vs. external sources of job candidates, or of internal vs. external equity considerations in fixing compensation levels. Finally, additional research should be directed towards examining possible ways in which HRM practices interact with other organizational variables in affecting entrepreneurship. Examples of such variables include company structure, technologies employed, types of budgetary and control systems, and stage of the organizational life cycle.

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