

PERFORMANCE IMPLICATIONS OF INCORPORATING NATURAL
ENVIRONMENTAL ISSUES INTO THE STRATEGIC PLANNING
PROCESS: AN EMPIRICAL ASSESSMENT*

WILLIAM Q. JUDGE, JR
THOMAS J. DOUGLAS

University of Tennessee

ABSTRACT

This paper explores the ability of firms to integrate a critical strategic issue, the natural environment, into the strategic planning process within the natural resource-based perspective. Using survey data collected from a wide variety of firms and industries based in the United States, we empirically examined the antecedents and effects of integrating the natural environment into the formal planning process. These data were analysed using structural equation modelling with the LISREL technique.

Overall, our data provided strong support for the hypothesized relationships. Specifically, we found that the level of integration of environmental management concerns in the strategic planning process was positively related to financial and environmental performance. Furthermore, we found that the greater the functional coverage and the more resources provided to environmental issues, the greater the integration of environmental issues in the planning process. These results suggest that concern for environmental issues may yield competitive advantages in the marketplace as the natural resource-based perspective suggests.

INTRODUCTION

Many firms have discovered that the natural environment is a critically important strategic issue. For example, a 1991 survey conducted by Booz-Allen and Hamilton showed that 67 per cent of the senior executives of major companies considered environmental issues to be 'extremely important' to their company (Newman and Breeden, 1992). That same survey found that these major companies spend approximately 2 per cent of their sales on environmental considerations. Similarly, in another recent survey of large American manufacturers, 94 per cent of the respondents rated environmental issues as strategically 'critical' or 'important' (McKee, 1991).

Some companies are responding to the challenges posed by the natural environment by integrating it into their strategic management processes. For example,

Address for reprints: William Q. Judge, Jr, 414 Stokely Management Center, University of Tennessee, Knoxville, TN 37996-0545, USA.

Taylor (1992), based on his interviews with 16 senior executives, found that some of the firms were seeking to gain competitive advantages by incorporating environmental issues into their business strategies. Also, Barrett (1991, 1992) and Dean and Brown (1995) suggested that increasing numbers of firms were creating competitive advantages by working to influence environmental regulations.

Finally, some executives are responding to environmental issues simply because they believe that it is the right thing to do (Stead and Stead, 1992). Increasing numbers of executives acknowledge that economic activity affects the environment and their values force them to integrate concern for economic growth with care for the environment. Under the rubric of 'sustainable development', these executives seek to ensure that economic activity limits or eliminates damage to our natural resources (Greeno and Robinson, 1992; Schmidheiny, 1990). As a result, these corporations are better able to meet the needs of all their stakeholders (Hutchinson, 1992).

One of the primary ways that firms respond to new strategic issues is to integrate those issues into their formal strategic planning process (Ansoff and McDonnell, 1990; Lorange et al., 1986; Steiner, 1979). For example, one set of issues that has received increasing attention by those involved with the strategic planning process relates to global business (Ghoshal, 1987). An illustration of this would be the Shell Oil Corporation's routine inclusion of global business parameters in their strategic planning process (deGuess, 1988). Similarly, technology issues are increasingly being examined within a planning context (Friar and Horwich, 1986). For example, executives at Merck routinely incorporate information about new biotechnology developments into their planning process (Nichols, 1994). A third example, and one that is central to this paper, consists of issues posed by environment. For example, the General Motors Corporation recently integrated environmental issues into its strategic planning process (General Motors, 1994) and this has resulted in improved financial and environmental performance.

Due to the emerging nature of the environment as a strategic issue, work has only begun to investigate the conceptual linkages between strategic management and the environment (e.g. Hart and Ahuja, 1994; Shrivastava and Hart, 1992; Stead and Stead, 1992). While these conceptual efforts have been essential, there has been a dearth of empirical studies on *how* organizations are responding to this new strategic issue. Consequently, this study empirically examines the antecedents and effects of incorporating the environment into the strategic planning process.

THEORETICAL DEVELOPMENT

To better understand the antecedents and effects of incorporating the natural environment into the strategic planning process, we used the planning-performance literature and the resource-based perspective (Wernerfelt, 1984). The resource-based perspective argues that competitive advantage and superior firm rents are dependent on the unique assembly of internal resources and capabilities which are valuable, rare, and imperfectly inimitable relative to an organization's competitors and which mitigate threats posed by the external environment (Barney, 1991).

The resource-based perspective has generated a productive dialogue among previously isolated perspectives (Conner, 1991; Mahoney and Pandian, 1992). For instance, Powell (1992b) used the resource view of the firm to clarify the relationship between strategic planning and performance that had evolved over many years. An interesting new extension of the resource-based perspective has linked concern for the natural environment to the resource-based view. Hart (1995) argued that due to increasing awareness of constraints imposed by the natural environment, pollution prevention, product stewardship, and sustainable development will increasingly be sources of competitive advantage. He called this perspective the 'natural' resource-based view of the firm and argued that we need to expand our considerations of firm performance to include environmental as well as financial dimensions. Central to his argument was that natural resources will be increasingly constrained in the future and those firms that better handle this constraint will command a sustainable competitive advantage.

Furthermore, Hart also theorized that a firm's ability to deal with the natural environment could be developed into an organizational capability. The capabilities of the organization 'refer to a firm's capacity to deploy resources, usually in combination, using organizational processes to effect a desired end' (Amit and Schoemaker, 1993, p. 35). Hart argued that dealing with natural environmental issues was a complex, social (i.e. tacit) process with which increasing numbers of firms must address. Therefore, the ability to integrate the natural environment into the strategic planning process offers a firm the opportunity to develop a valuable, potentially rare, and not easily imitated organizational capability.

For this study, we test the theoretical assumption that firms that have better developed the capability of integrating environmental issues into the strategic planning process will yield superior financial and social outcomes. Recent work by Russo and Fouts (1997) suggests that this theoretical framework will be productive. We examine how this level of integration influences financial and environmental performance; and we explore several antecedents that may drive this integration effort.

Outcomes of Integrating the Natural Environment into Strategic Planning

Amit and Schoemaker (1993) distinguish between organizational *capabilities* and organizational *resources*. This distinction is important, since many firms may possess certain financial, physical, or human resources, but it is the ability to combine these resources using knowledge and skills that may render these capabilities tacit and/or socially complex, potentially leading to competitive advantage (Grant, 1991).

Ramanujam et al. described strategic planning processes as 'multifaceted systems that are contextually embedded' (1986, p. 348). Successful integration of an important, external issue such as the natural environment into such a process can be viewed as the development of a capability as defined by the resource-based perspective. Since the planning process can have multiple 'desired ends' (Ramanujam et al., 1986; Steiner, 1979), both financial and environmental outcomes will be addressed.

Financial outcomes. The strategic planning system does not consume many physical resources within a firm, but it does consume considerable executive time

and it does influence major resource investments within the firm. Consequently, the strategic planning process can have a material impact on the firm's financial performance (Miller and Cardinal, 1994). Previous research using the resource-based perspective has shown that the strategic planning system can yield favourable performance outcomes if its existence within an industry is not ubiquitous (Powell, 1992b). Extending that logic, firms may be able to create competitive advantages by incorporating the natural environment into their strategic planning system better than other firms within their industry. Fineman and Clarke (1996) did find that firms often include environmental issues in their planning processes, therefore the important question concerns the effect of this capability.

There are two basic reasons which support this logic within the management literature. First, the environment is significantly *threatening* the cost structure of many businesses (Makower, 1993). Some of this increase in cost is derived from the growth and complexity of federal and state environmental regulations. These regulations are increasingly raising the standards for environmental compliance and, as a result, this requires correspondingly more management attention, capital, and technical resources to address these rising standards. For example, it is estimated that pollution prevention equipment will cost American businesses \$160 billion in 1995 (Sullivan, 1992). Furthermore, there is often a real or potential cost of legal liability due to environmental problems (Greeno and Robinson, 1992; Hunt and Auster, 1990).

An additional source of cost is due to unnecessary waste. Because of the increasing interest in redesigning production systems to reduce waste, 'green' technologies are beginning to emerge and significant environmental and economic waste streams are being reduced or eliminated (Vandermere and Oliff, 1990). In fact, Nehrt (1996) found that first-mover firms that adopted new pollution-reducing technologies displayed stronger net income growth than other international firms in the chemical bleached paper pulp manufacturing industry. In addition, firms are reducing waste and hence cost through the usage of environmentally 'safe substitutes' (Welter, 1991). Furthermore, some firms are reducing waste and cost by influencing suppliers and buyers (Kirkpatrick, 1990). In sum, issues associated with the environment pose a considerable external threat to increasing numbers of businesses through their impact on the cost of doing business, and firms that have successfully responded to these issues have gained competitive advantage.

Second, the natural environment sometimes offers significant new business opportunities (Cairncross, 1992). For example, some firms are discovering that by modifying the inputs, throughputs, and/or outputs of their systems, they can differentiate their goods and services from the competition and thereby gain a competitive advantage. Notably, consumers report that they are willing to pay 6.6 per cent price premiums for environmentally friendly products (Roper, 1990). In consumer markets, 'green' products constituted 13.4 per cent of all new product introductions in 1991, up from 0.5 per cent in 1985 (Ottman, 1992). There are even some arguments that properly designed environmental regulations can spur corporate innovations and create new markets (Hart, 1995; Porter and Van der Linde, 1995). As a result, some firms are gaining competitive advantages by proactively addressing environmental issues.

Therefore, we would expect that the more that natural environmental concerns

are integrated into the strategic planning process, the better the financial performance of the firm. In other words, firms that prove more adept than their competitors at developing this firm capability that allows them to manage the tradeoff between environmental benefits and costs should experience relatively better performance, all other factors being equal (Wally and Whitehead, 1994). Hart (1995) has noted that the capability of pollution prevention is tacit and, hence, hard for competitors to copy. The basic argument for the expectation of superior performance is that, by lacking this important capability concerning natural environmental issues, significant costs are incurred or major opportunities are missed (Stead and Stead, 1992, 1995). Consequently, we would expect a positive relationship between the capability of integrating environmental issues into the strategic planning process and financial performance.

Hypothesis 1: There will be a positive relationship between the level of integration of environmental issues into the strategic planning process and the firm's financial performance.

Environmental outcomes. Apart from the financial benefits of developing this capability of integrating environmental issues into the strategic planning process, some management scholars argue that the firm has a societal duty also to attend to the environmental performance of the firm (Starik and Rands, 1995; Stead and Stead, 1992, 1995). We define environmental performance as a firm's effectiveness in meeting and exceeding society's expectations with respect to concerns for the natural environment. This desired end would extend beyond mere compliance with existing regulations to a proactive stance concerning future environmental considerations.

Gilbert and Freeman (1988) argued that strategic decision makers have an ethical responsibility to care for many stakeholders, including 'mother' earth, as they form their strategies. Shrivastava (1995) also discusses the stark result of taking a 'denatured' approach to organizational outcomes. As a result, the environmental performance of the firm is another critical dimension of organizational effectiveness which needs to be considered from a larger, societal perspective (Andrews, 1987; Hart and Ahuja, 1994).

Consistent with this societal obligation is the recent development in the strategic management literature that encourages multiple measures of organizational performance. For example, Judge and Krishnan (1994) found that different corporate strategies were associated with different types of financial and non-financial organizational performance levels. Similarly, Judge (1994) found that different organizational contexts and managerial skills produced different financial and social performance outcomes. Notably, the need to satisfy multiple stakeholders has been advanced as a key reason to use multiple measures of organizational effectiveness (Chakravarthy, 1986; Judge and Fowler, 1994; Venkatraman and Ramanujam, 1986). Therefore, strategic planning can and should have an impact beyond the financial performance of the firm (Ramanujam et al., 1986).

Based on this logic, it stands to reason that the more that environmental issues are incorporated into the strategic planning process, the better and more comprehensive is the information existing for top managers to care for the environment (Stead and Stead, 1995). Developing this capability of incorporating environmental

issues in the planning process allows environmental champions to assert themselves (Winn, 1995). Fineman and Clarke (1996) demonstrated the importance of such champions in contributing to a firm's environmental actions. Furthermore, the development of this capability signals to the rest of the organization what is valued and important (Ansoff and Brandenburg, 1967; Quinn, 1980; Reid, 1989). Consequently, this signalling device can focus employee time and attention on the environmental performance of the firm. In sum, we would expect that the greater the integration of environmental issues into the strategic planning process, the better the environmental performance of the firm.

Hypothesis 2: There will be a positive relationship between the level of integration of environmental issues into the strategic planning process and the firm's environmental performance.

Antecedents of Level of Integration of Environmental Issues

The resource-based perspective argues that unique combinations of firm resources raise barriers to imitation and hence create competitive advantages (Rumelt, 1984). Resource investment decisions are clearly strategic in nature. With respect to this study, one key determinant of the firm's ability to develop this capability within the planning process is the 'level of resources provided' to that process (Ramanujam et al., 1986). In fact, Ramanujam et al. identify 'resources provided' as one of the two key dimensions for the effectiveness of a planning system 'in the broadest sense' (1986, p. 366). As a result, the natural resource-based perspective predicts that the level of resources provided to natural environmental issues into the strategic planning process is an essential antecedent variable.

Specifically, when resources are invested to track and address environmental issues, the planning literature suggests that the firms are more likely to integrate environmental issues into its planning system (Lorange, 1980; Ramanujam et al., 1986; Robinson and Pearce, 1988; Steiner, 1979). In contrast, minimal investments in resources to cover environmental issues should limit the level of integration into the planning process, and thus this capability. In other words, investment in natural environmental issues should create a need to obtain a 'return' on that investment by integrating it into the strategic planning process. This suggests the following relationship.

Hypothesis 3: There will be a positive relationship between the amount of resources provided to attend to natural environmental issues and the level of integration of environmental issues into the strategic planning process.

The resource-based perspective also argues that the unique combination of organizational resources defines the 'resource bundle' which ultimately determines the firm's performance level (Amit and Schoemaker, 1993; Barney, 1991). Viewed as 'invisible assets' (Itami, 1987), these capabilities are often the result of 'an integration of individual functional capabilities' (Grant, 1991, p. 121) at the corporate level (Amit and Schoemaker, 1993). Therefore, in addition to the level of resources, the resource of configuration also determines the effectiveness of the capability (Black and Boal, 1994).

Within the planning literature, the primary configurational feature of the strategic planning process is the 'degree of functional integration' which is defined as the degree to which the strategic planning process is integrated with different functional requirements from a general management perspective. Ramanujam et al. (1986) found that the degree of functional integration was the second most important determinant of planning process effectiveness. This variable is essential to our study because environmental issues are often multi-functional in nature (Shrivastava and Hart, 1992; Taylor, 1992).

Indeed, others have found that proper functional coverage is necessary for success (Hitt et al., 1982; Lorange, 1980; Snow and Hrebiniak, 1980). The logic of this relationship is that 'functional silos' obstruct effective strategic decision making and action. In contrast, when a firm is functionally integrated, it is more collaborative in information sharing and more cohesive in its organizational behaviour. This suggests the more that environmental issues are integrated into the various functional areas, the more that environmental issues will be integrated into the strategic planning process due to the superior cross-functional communication and information flow that exists. Stated more formally:

Hypothesis 4: There will be a positive relationship between the degree of functional coverage of natural environmental issues and the level of integration of environmental issues into the strategic planning process.

An overall model of the relationships described above is offered in figure 1. Specifically, this model graphically depicts the theoretical paths between the

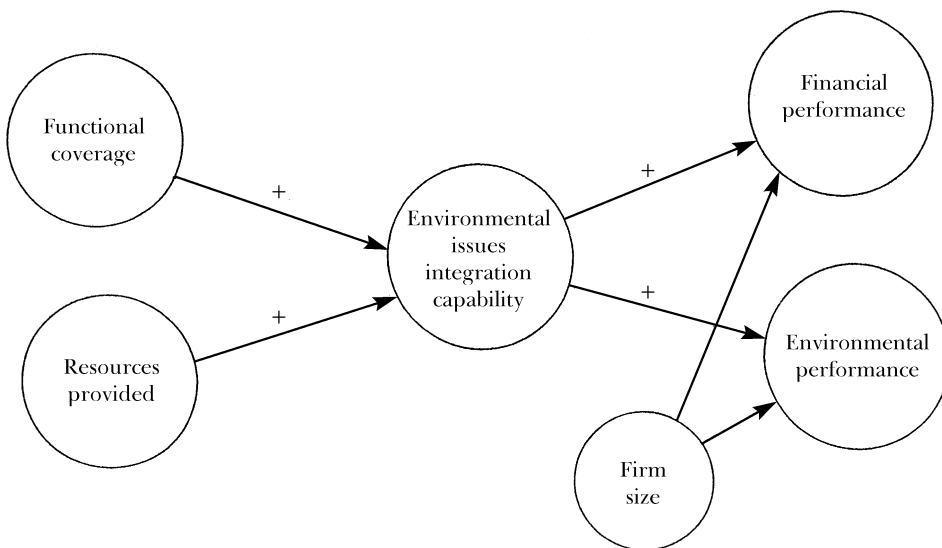


Figure 1. Research model of how firms develop the capability of integrating natural environmental issues into the strategic planning process

antecedents of the development of the capability of integrating environmental issues into the strategic planning process (functional coverage and resources provided) as well as the effects of this capability on the firm's financial and environmental performance. By empirically examining this model, we expect to refine and extend our understanding of the strategic planning process as well as environmental management.

METHODOLOGY

Data Collection

A questionnaire was sent to 725 environmental executives from US-based firms selected at random from the 1992 *World Environmental Directory's* listing of corporate environmental officers. The sampling frame represented a population of firms of various size, with the smallest having only 20 employees to the largest with 430,000. The median size of organizations studied was 6,000 employees. These firms represent companies that have shown interest in environmental management at least from the standpoint of appointing an environmental officer. Henriques and Sadorsky (1995) have demonstrated a very strong positive relationship between the establishment of a position such as an environmental officer and the formulation of an environmental plan of action. Since the purpose of this study is to evaluate the integration of environmental issues into the strategic planning process, this set of companies and industries seems appropriate.

The respondents reported that their companies were active in over 300 primary industries ranging from chemicals to paper products, with multiple entries possible. The industry most common to our respondents was the chemical industry, but it accounted for only 14 per cent of the responses. As might be expected, the industries in our study contain the ones that have been most affected by environmental regulations.

There were 217 responses, resulting in a response rate of approximately 30 per cent. The sample was reduced to 196 usable responses by dropping the 20 surveys that were completed by individuals who worked in other than the corporate or divisional offices of the firm. This was done to ensure that the respondents were associated with a level within the company that would be expected to engage in strategic planning.

To test for non-response bias, a sample ($n = 49$) was randomly selected from the non-respondents and was used to provide comparative statistics to the sampled firms for which the same data could be obtained. The mean results of the non-respondents (19,778 employees; \$7.1 billion in assets; 4.0 per cent ROS; 2.7 per cent ROA) compares favourably to the mean sample results (19,902 employees; \$7.3 billion in assets; 4.4 per cent ROS; 2.4 per cent ROA). As a result, there does not appear to be any response bias based on multiple measures of size or profitability.

To encourage participation and provide some benefit to the respondents, an executive summary of the survey responses was offered to all the participants. The majority of the participants requested this summary and it was delivered several months after the completion of the survey.

Variables and Measures

Functional coverage. Similar to Ramanujam et al. (1986, p. 350) we defined functional coverage as 'the extent of environmental coverage given to different functional areas with a view to integrating different functional requirements'. We operationalized this construct using a four-point Likert scale across seven functional areas of the firm. The scale is listed in the appendix. These seven functional areas were chosen in order to represent the key elements of the value chain (Porter, 1985) that had the potential to be most involved in an organization's activities with respect to environmental issues. The items measuring this latent construct of functional coverage were combined using a structural equation measurement model. This technique was used for all multi-item constructs. The composite reliability index for the scale in this study was 0.72, which is acceptable for this study. The composite reliability index is used to assess the internal consistency of the indicators in a structural equation measurement model (Medsker et al., 1994). It is analogous to coefficient alpha.

Resources provided. This construct represented the level of commitment of organizational resources to issues related to the environment and its specific measurement is listed in the appendix. This variable captures the notion that adequate resources must be committed to the planning of an activity for it to be successful (Ramanujam et al., 1986; Steiner, 1979). Since resource allocation is a strategic decision (Chandler, 1962; Quinn, 1980; Steiner, 1979), the commitment of funds is reflective of the extent to which the firm is providing financial, physical and human resources to an issue such as the environment.

Environmental issues integration. We defined this construct as the organization's capability to incorporate issues related to the environment into the strategic planning process. This concept goes beyond mere compliance with environmental regulations and includes activities that also measure the proactiveness of the organization with respect to this issue. We operationalized this construct with a five-point Likert scale across four items. The scale is listed in the appendix. These items were derived from the emerging environmental management literature (Greeno and Robinson, 1992; Hunt and Auster, 1990; Newman and Breeden, 1992). The composite reliability index for this scale in the study was 0.90.

Financial performance. Financial performance is a construct emphasizing the profitability and growth of the firm. To measure this construct, we used a set of well-established perceptual measures of financial performance from the literature, asking each respondent to rate their organization's performance in four categories relative to other firms in their industry. Since industry effects on performance have been shown to be significant (Rumelt, 1991; Schmalensee, 1985), and our sample contained multiple industries, it was necessary to control for industry differences in the level of performance using this relative measure. This approach is seen as a necessary proxy for the evaluation of competitive advantage in the resource-based research (Montgomery and Wernerfelt, 1988; Powell, 1995). The measures in our study were taken from Miller and Friesen (1984), but highly similar variations of these items can be found in the planning and resource-based

literature (e.g. Boyd, 1991; Powell, 1995; Ramanujam et al., 1986). The actual scale used is given in the appendix. The composite reliability index for the scale in this study was 0.85.

The use of perceived performance data is well established in the literature (Covin et al., 1994; Dess, 1987; Lawrence and Lorsch, 1967; Miller and Cardinal, 1994; Powell, 1992a). Given the heterogeneous sample used in our analysis and the potential for significantly different accounting and investment adjustments during the time period in this study, the use of perceptual instead of archival data is preferred (Powell, 1995). Indeed, we concur with Jacobsen (1987) when he concluded that '(a) "true" measure of economic return for a grouping of assets, such as a firm, is quite elusive' (p. 471). Furthermore, Miller and Cardinal (1994) provide a potential reason for a preferred reliance on perceptual performance data, stating: 'It may be that informant data, which individuals typically give under conditions of promised anonymity for their firms, basically reflect true performance, but archival data to a substantial degree reflect public relations, tax, and other extraneous considerations that create noise in the data' (p. 1661).

None the less, we were curious what the relationship was between perceived and archival financial performance data. To address this issue of the relationship between perceptual and archival financial performance data, Return on Assets (ROA) and Return on Sales (ROS) data were obtained for a subset of the public companies in the sample from Compact Disclosure for the years 1992–1994. Very quickly we came to see the problems with using archival performance measures on a number of fronts. First, only one-quarter of our sample contained publicly available financial data. Clearly, this omission of three-quarters of our respondents without publicly available data would limit the generalizability of our study.

Second, it was not possible to determine the precise industry that the respondent used to evaluate their relative performance when completing the survey. Did they respond based on the primary four-digit SIC industry associated with their corporation, with a secondary industry based on the corporate division that they represented, or a subset of the industry leaders with whom they were competing? Realizing that our ability to match the various response options was limited, we opted to adjust each firm's ROA and ROS value by subtracting the mean ROA and ROS value associated with their primary four-digit SIC.

Third, it was noted that major accounting adjustments were made in the 1992–1994 time period. For example, during this period major corporations were required to adopt Statement of Financial Accounting Standards No. 106, 'Employers' Accounting for Postretirement Benefits Other Than Pension', which resulted in large one time adjustments to net income. As a result, the respondents are in a more informed position to factor these complexities into their assessments.

In spite of these potential problems, the correlations associated with our perceptual measure of financial performance and ROA ($r = .26, p < .05$) and ROS ($r = .26, p < .05$) respectively, were significant, although somewhat lower than desired. In sum, this positive and significant level of correlation between perceptual measures and archival measures of financial performance are similar to other studies and it remains unclear which is more accurate (Miller and Cardinal, 1994; Powell, 1995). However, since our data set using perceptual measures of performance is far more complete than the one that would only use archival data, its use is preferred.

Environmental performance. Environmental performance was conceptualized as organization-wide commitment to environmental excellence relative to the rest of the industry in a variety of areas. Similar to the environmental integration measure, we derived these items from the emerging environmental management literature (Hart and Ahuja, 1994; Shrivastava and Hart, 1992; Stead and Stead, 1995), and they are consistent with the arguments of Lober in terms of using multiple criteria to 'measure the greenness of a company' (1996, p. 197). The scale is listed in the appendix. Similar to the financial performance measures, all of these measures were obtained relative to other firms in their relevant industry. The composite reliability index of the scale for this study was 0.90.

Firm size. Previous studies have shown that firm size affects the sophistication of the strategic planning process as well as organizational effectiveness (Boyd, 1991; Robinson and Pearce, 1983). Since one of the key purposes of strategic planning is to integrate and control the various parts of the firm, this benefit is seen as more valuable to large firms than small ones (Miller and Cardinal, 1994). Therefore, the natural logarithm of the number of employees (Powell, 1992b) in the study firms was included in the model in order to account for this potentially confounding factor. This measure was obtained from archival sources.

Data Analysis

Having followed Boyd's (1991) recommendations concerning the multi-dimensionality of both the planning and performance constructs, we also followed his analytical approach recommendation by using a structural equation model. Structural equation models are able to incorporate estimates of measurement error into the study with the result of reducing possible bias in the parameter estimates via the use of multiple indicators. Therefore, LISREL 7.2 was used to perform the necessary structural equation estimations in our study. LISREL is an analysis procedure that combines path analysis with factor and multiple regression analyses (Joreskog and Sorbom, 1989).

RESULTS

Table I provides the standardized factor loadings for the measurement model. All of the loadings are greater than .4 except the accounting/finance (.375) and legal (.388) indicator variables associated with Functional Coverage, and the market share change (.356) indicator variable associated with Financial Performance. Since the composite reliability indices estimated for these sets of variables were high, we elected to retain all of the indicators.

Table II presents the means, standard deviations, and correlations of the measurement variables. All of the correlations between the independent variables are low or moderate suggesting that multicollinearity is not a problem. In addition, frequency tables were produced for each of the items in the survey. This was done to ensure that the scales were being fully utilized by the respondents, ensuring that the scales were adequately representing the concepts in the study. No problems were noted in our analysis of the descriptive data.

The results of the full structural model are presented in figure 2. The correla-

Table I. Factor loadings of measurement model

<i>Parameters</i>	<i>Loadings</i>
Functional coverage:	
Production/operations	.605
Marketing/sales	.609
Accounting/finance	.375
Product development	.567
Public relations	.634
Legal counsel	.388
Purchasing	.423
Environmental issues integration:	
Within planning process	.739*
Within the mission statement	.522
Top management team makes proactive decisions	.849
Participation by environmental personnel in planning	.800
Financial performance:	
Return on investment	.754*
Earnings growth	.926
Sales growth	.558
Market share change	.356
Environmental performance:	
Compliance with regulations	.718*
Ability to limit impact beyond compliance	.785
Ability to prevent and mitigate crises	.787
Education of employees and public	.644

Note:

*We set these factor loadings to 1.00 in order to assign a scale to the endogenous latent variables, noting that the fixed values have changed as a result of standardization. All factor loadings are significant at $p > .01$, two-tailed tests.

tions associated with the latent variables in the full structural model are shown in table III. Since we used the standardized solution for this stage of the model, the latent variable means and standard deviations are 0 and 1 respectively. In general, there was a good fit within the overall model. In this case, the fit of the model was tested using the Noncentralized Normed Fit Index (NCNFI), which was suggested by Bentler (1990) as the test that was least affected by potential bias in the chi-square values ($\chi^2 = 334.81$, 184 df, $p = .000$). Values of NCNFI can realistically range from 0 to 1, with values closest to 1 representing the best fit (Marsh et al., 1988). The value of NCNFI calculated in this study was .87, which seems to represent a sufficiently good fit of the data.

An additional measure of fit, the Relative Normed Fit Index (RNFI), has been suggested to assess the fit of the latent model separately from that of the measurement model (Medsker et al., 1994; Mulaik et al., 1989). The value of RNFI calculated for this study is .91, which represents relatively good fit for the portion of the model that tests the hypotheses.

Also, to identify specification of measurement errors, we used the root-mean-squared residual (RMSR), a measure of average residual error. The closer this value is to 0, the less the error, with a rule of thumb that a value less than or

Table II. Means, standard deviations and correlations of the measurement model ($n = 170$)

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<i>Financial performance</i>																						
1. ROI	3.55	0.88																				
2. Earnings growth	3.49	0.85	.71																			
3. Sales growth	3.48	0.74	.35	.51																		
4. Market share	3.43	0.76	.21	.29	.61																	
<i>Environmental performance</i>																						
5. Envr. compliance	4.02	0.67	.17	.09	.10	.17																
6. Limiting impact	3.71	0.81	.22	.19	.15	.08	.52															
7. Preventing crises	3.93	0.69	.16	.20	.14	.13	.60	.63														
8. Educating	3.40	0.85	.21	.18	.07	.01	.49	.51	.46													
<i>Environmental issues integration</i>																						
9. In planning	1.94	0.80	.17	.18	.01	.05	.22	.33	.28	.35												
10. Mission statement	2.06	1.07	-.03	-.02	.03	.05	.20	.17	.14	.25	.38											
11. TMT decisions	2.20	0.86	.24	.24	.22	.13	.28	.38	.33	.29	.62	.47										
12. Envr. personnel in planning	2.32	0.93	.11	.12	.02	.05	.32	.40	.29	.35	.63	.39	.68									
<i>Resources provided</i>																						
13. Resource commitment	3.84	0.69	.23	.21	-.00	.04	.25	.32	.30	.19	.24	.19	.39	.31								
<i>Firm size</i>																						
14. Employees (ln)	8.65	1.80	-.09	.05	.23	.13	-.06	.00	.01	-.08	-.04	.08	-.06	-.23	-.06							
<i>Functional coverage</i>																						
15. Production integrtn	1.93	0.70	.07	.06	-.01	-.03	.25	.27	.24	.22	.42	.24	.35	.38	.25	-.03						
16. Marketing integrtn	3.01	0.66	.04	.06	.02	-.05	.14	.13	.13	.26	.29	.26	.34	.29	.18	-.16	.38					
17. Accounting integrtn	2.85	0.72	.03	.08	.11	.08	.14	.27	.13	.18	.24	.12	.30	.30	.12	-.05	.19.15					
18. Product development integration	2.72	0.93	-.01	.10	.16	.07	.17	.19	.18	.08	.30	.20	.37	.26	.19	-.00	.34	.39.18				
19. Public relations integration	2.29	0.79	-.02	.04	-.02	-.01	.18	.18	.21	.16	.22	.33	.24	.22	.13	-.07	.33	.38	.23	.43		
20. Legal integrtn	1.64	0.64	.02	.04	.07	.05	.17	.22	.22	.00	.14	.21	.25	.16	.19	.19	.27	.14	.21	.09	.40	
21. Purchasing integrtn	2.70	0.70	.07	.07	-.01	.03	.18	.22	.08	.14	.12	.22	.21	.20	.16	-.04	.23.34	.19	.12	.33	.15	

Note:

*Variables are grouped by the structural model constructs.

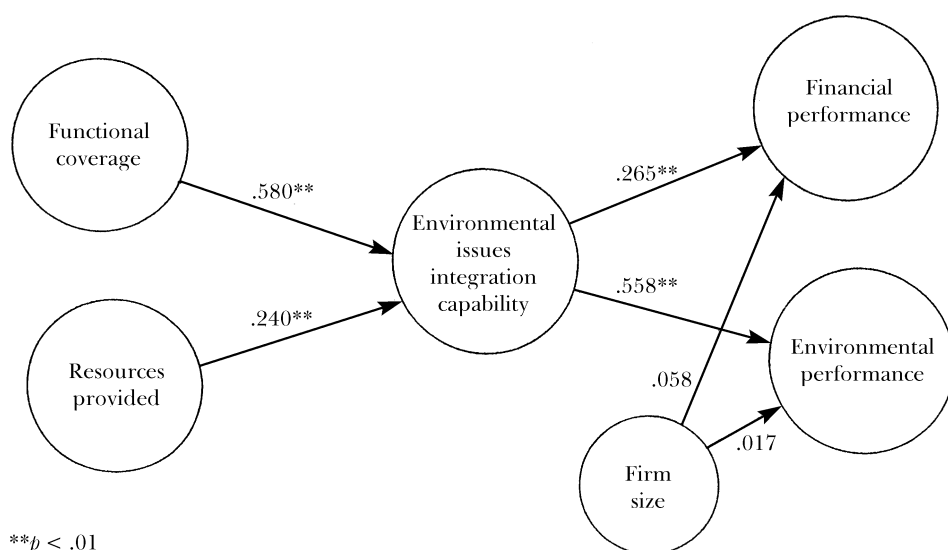


Figure 2. LISREL model of how firms develop the capability of integrating natural environmental issues into the strategic planning process

Table III. Correlations associated with the structural model ($n = 170$)

Variables	1	2	3	4	5
1. Financial performance					
2. Environmental performance	.15				
3. Environmental issues performance	.26	.56			
4. Resources provided	.11	.24	.43		
5. Firm size	.06	-.01	-.07	-.06	
6. Functional coverage	.17	.37	.66	.32	-.09

equal to .10 (e.g. Lance et al., 1992) is acceptable. The value from our study is .071, which also indicates a good fit.

Research Findings

As suggested from the LISREL model, level of integration of environmental issues into the strategic planning process was positively related to financial and environmental performance. Specifically, level of integration and financial performance had a standardized coefficient of .265 and was significant at the .01 level. This finding supports hypothesis 1. In addition, level of integration and environmental performance had a standardized coefficient of .588 and was also significant at the .01 level. Consequently, our data provide evidence to support hypothesis 2 as well.

Regarding the antecedents of level of integration, we found that resources

provided was positively associated with level of integration as hypothesized ($t = 6.08$, $p < .01$). Furthermore, functional integration was also positively related to level of integration ($t = 3.17$, $p < .01$). In sum, our data also provide support for hypotheses 3 and 4.

DISCUSSION

All four of our hypotheses were supported by the data in the study. As a result, our study offers relatively strong support for the natural resource-based perspective advanced by Hart (1995) who argued that firms will be increasingly constrained and dependent upon the natural environment. Hart (1995) predicted that the development of a pollution-prevention capability would result in lower relative costs and emissions. The data in our study seem to support this expectation.

Based on our study, it appears that firms that provide sufficient resources and successfully co-ordinate their strategy across relevant functions are better able to integrate environmental issues into the strategic planning process. This finding supports the notion that specific strategic issues can be programmed into the strategic planning process so that effective and co-ordinated action can take place (Ansoff and Brandenburg, 1967; Lorange, 1980; Mintzberg, 1981, 1994). The findings also support the work of Ramanujam et al. (1986) with respect to substantiating the planning dimensions of functional coverage and resource commitment within the context of dealing with the strategic implications of natural environmental issues.

Our findings raise some interesting questions about the long-term sustainability of those competitive advantages. For example, Powell (1992b) found that the strategic planning process only yielded competitive advantage in industries where planning had not been universally adopted. Similarly, Nehrt (1996) found that first movers in the adoption of new pollution-reducing technologies were granted sustainable competitive advantage. Thus, there may be some first-mover advantages to integrating the natural environment into the strategic planning process.

However, it isn't clear what the long-term advantages of this integration are. We simply do not know how tacit or embedded the integration of environmental issues into the strategic planning process is. Theory predicts that the more embedded that integration is, the greater and more sustainable the competitive advantage. Only a longitudinal study can help us answer this question of sustainability.

With respect to performance, our study supports both the planning and resource-based literatures. First, we found a relationship between planning sophistication and performance as described by Boyd (1991). Specifically, we found positive relationships between level of integration of environmental issues into the strategic planning process and both financial and environmental performance. Second, the study discovered that a tacit, hard-to-imitate capability that mitigated an important external threat was related to competitive advantage as expected by the resource-based theory of the firm (Barney, 1991; Conner, 1991). While the causal linkages between these constructs are unknown and these findings are tentative, it is encouraging that our results fit with the theoretical predictions.

Nevertheless, there are certain limitations to this study which must be consid-

ered. First, all of our data were self-reported by the participating firms. While we took great pains to establish the reliability and validity of our data and we did survey the senior-most individual responsible for environmental issues within the top management team, we simply do not know if these measures can be generalized to the entire organization. In addition, while we found no evidence of response bias in terms of the company characteristics for the respondents versus the non-respondents, this does not guarantee that there would not be a difference in the non-respondents' answers to the survey questions. Future research is needed with similar measures addressed by multiple respondents in different industries to replicate our findings. It would also be desirable to use multiple items to measure the concept of resources provided in order to capture its complexity.

Second, like so much of the data used in organizational science, our data are cross-sectional. As a result, we theoretically assume the causal relationships, but do not test them directly. Consequently, it is possible that higher levels of financial and/or environmental performance lead to more slack, which permits greater integration of environmental issues into the strategic planning process. Notably, recent research by Henriques and Sadorsky (1995) has revealed that *prior* organizational performance was not predictive of subsequent environmental planning. Their research, coupled with our research findings, suggest that environmental planning is more of an antecedent of organizational performance than a derivative outcome. Clearly, longitudinal research is needed to settle this matter.

Third, the generalizability of the study is limited by the sampling frame used. While the organizations sampled do represent a wide range of organizational sizes and industries, it is limited to firms that have appointed environmental officers and, therefore, to the industries that are environmentally sensitive. Future research should examine firms in similar industries that have not appointed environmental officers to discern if this sampling criterion limits the generalizability of our results.

Despite these limitations, our findings are quite robust and the results are very provocative. It appears that firms that better develop the capability to incorporate concerns for the environment into their strategic planning process possess competitive advantages in the marketplace and are better stewards of the environment. Therefore, a classic 'win-win' relationship appears to exist and the strategic planning process may be the vehicle for achieving this desirable goal (Elkington, 1994; Stead and Stead, 1995). In contrast, the persuasive 'lose-win' argument advanced by Wally and Whitehead (1994) may be premature. Clearly, additional research is needed to further explore these relationships.

Although our data show that the benefits of corporate environmental practices appear to outweigh the costs, the exact relationship is by no means clear. For example, some observers have argued that the benefits of proactive corporate activism regarding the natural environment may simply be the result of non-recurring cost-reducing windfalls afforded to the corporation by addressing 'low-hanging fruit'. This perspective is especially provocative to economists as it suggests that firms are not operating on their private efficiency frontiers.^[1] Others, such as Hart (1995), argue that the benefits are systemic and long term. Thus, it would be extremely helpful to know 'where returns to environmental performance end', as Russo and Fouts (1997, p. 552) recently concluded. Relatedly, it would also be helpful to know *when* those returns end. Clearly, these are important issues for not only private sector managers, but also public sector regulators seeking to

preserve market competition as well as a sustainable natural environment.

Overall, these findings refine and extend the natural resource-based perspective as well as offer useful insights into the strategic planning research. Hart (1995) advanced a conceptual argument for the resource-based perspective to include the natural environment. He argued that those firms which better incorporated the natural environment into the firm's capabilities would experience superior performance. This argument challenges the conventional view that environmental concerns cost the firm more than it benefits (Wally and Whitehead, 1994). Our study provides modest empirical support for the natural resource-based perspective advanced by Hart. While these results are intriguing, additional research is clearly needed.

Also, this study provides evidence, as suggested by a number of researchers (e.g. Amit and Schoemaker, 1993; Conner, 1991; Peteraf, 1993; Wernerfelt, 1995), that the resource-based perspective is useful in further evaluating earlier strategic management research streams. In this case, we framed the planning literature within the natural resource-based perspective and new insights were generated. Furthermore, by identifying two antecedents of integration into the strategic planning process, we have provided opportunities for managers to implement and field test our findings. We hope that future research in the form of longitudinal case studies and additional surveys will refine and extend our understanding of the development of the organizational capability of integrating environmental issues into the strategic planning process.

APPENDIX

Measurement Scales

Functional coverage. Respondents assessed the extent to which their environmental department is currently co-ordinating its activities with each of the following functional areas (1, very highly integrated to 4, not at all integrated):

1. Production/operations
2. Marketing/sales
3. Accounting/finance
4. Product development
5. Public relations
6. Legal counsel
7. Purchasing

Resources provided. Which phrase best captures the resource commitment of this company to the environmental department? (1, minimal resource commitment to 5, open-ended funding)

Environmental issues integration. Respondents were asked to indicate the strength of their agreement with the following statements (1, strongly agree to 5, strongly disagree);

1. Environmental issues are explicitly considered within the company's

strategic planning process.

2. Consideration for the natural environment is addressed within the company's mission statement or statement of business principles.
3. When environmental issues are considered within the strategic planning process, the top management team makes proactive, forward thinking decisions.
4. Environmental personnel participate influentially in the company's strategic planning process.

Financial performance. Respondents rated their overall performance on each of the following objectives relative to others in their industry (1, much worse to 5, much better):

1. Return on investment
2. Earnings growth
3. Sales growth
4. Market share change

Environmental performance. Respondents rated their overall performance on each of the following objectives relative to others in their industry (1, much worse to 5, much better):

1. Complying with environmental regulations
2. Limiting environmental impact beyond compliance
3. Preventing and mitigating environmental crises
4. Educating employees and the public about the environment

NOTES

*An earlier version of this paper was accepted in the 1995 Best Paper Proceedings of the Academy of Management.

[1] We are indebted to one of the reviewers for this thoughtful observation and insight.

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