

## ORGANIZATIONAL FORM AND ENVIRONMENT: AN ANALYSIS OF BETWEEN-FORM AND WITHIN-FORM RESPONSES TO ENVIRONMENTAL CHANGE

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*This study extends previous research on organizational adaptation to major environmental shifts by empirically examining the potential constraining effects of organizational form, operationalized using the Miles and Snow typology, on the type of responses enacted as well as the performance effects of the responses. Results indicate that a fit between environmental contingencies and organizational form relates to superior performance. The results also provide support for the idea that organizations systematically move toward the higher-performing forms for a given environment. Consistent with organizational configuration logic, while these responses lead to performance improvements when a between-form change is made, they do not necessarily lead to performance improvements when a within-form change is made. Copyright © 2000 John Wiley & Sons, Ltd.*

Successful movement between organizational forms is considered rare (Miller and Friesen, 1984), due to the constraining forces of the environment and structural inertia of the form itself. Organizational forms possess distinct organizational competencies (Barnard, 1938; Miles and Snow, 1978; Selznick, 1957; Snow and Hrebiniak, 1980) which limit the range of choices available to an organization when faced with environmental change (Miles and Cameron, 1982; Prahalad and Hamel, 1990). Configurational theorists have posited that managerial search for strategic responses tends to remain within the response set of the prevailing form (Greenwood

and Hinings, 1993; Hinings and Greenwood, 1988; Miles and Snow, 1978). Even when movement between forms does occur, most organizations operate in a strategic 'comfort zone' in which they opt for strategies that are not radically different from their current strategy (Shortell, Morrison, and Friedman, 1990).

Although organizations faced with environmental change find it difficult to change in ways inconsistent with their prevailing form (Greenwood and Hinings, 1988, 1993; Hinings and Greenwood, 1988; Kelly and Amburgey, 1991; Miles and Snow, 1978; Miller and Friesen, 1980, 1984; Sastry, 1997) some organizations do change their form (Haveman, 1992; Singh, House, and Tucker, 1986; Zajac and Shortell, 1989). This is especially true for organizations that find their distinctive capabilities no longer applicable in a rapidly changing environmental context. How-

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ever, organizations that do change form in response to environmental shifts are in effect setting back the liability of newness clock (Stinchcombe, 1965), because the firm faces many of the same problems after a change that a newly founded organization encounters. Further, organizational change has been posited to threaten the firm's performance levels and chances for survival (Hannan and Freeman, 1984, 1989), particularly if the changes involve core features of the organization (Singh, House, and Tucker, 1986).

Therefore, two issues concerning environmental change—organizational form and performance—remain unresolved. Few would argue with the fact that there are times when organizations should respond to environmental changes, and sometimes a transformation of organizational form is required. What remains unclear is the extent to which form actually affects how an organization responds or does not respond and the extent to which these responses (non-responses) are generally adaptive, or performance enhancing. Unfortunately, large-sample studies of the effects of form on organizational responses (Kelly and Amburgey, 1991; Zajac and Shortell, 1989) have produced conflicting findings, suggesting the need for further investigation. The same is true for results from previous studies regarding the performance effects of organizational responses to environmental change (Haveman, 1992; Singh *et al.*, 1986; Zajac and Shortell, 1989).

One reason why results from research regarding the interrelationships between organizational form, response to environmental change, and performance may be mixed is that prior research has had the tendency to focus on changes between organizational forms as opposed to also examining changes within organizational form (Fox-Wolfgramm, Boal, and Hunt, 1998). Given that organizations can respond to emerging environmental conditions by making changes either within their current form or by changing to another form, the current study examines both within-form and between-organizational-form changes. Also, with notable exceptions (e.g., Zajac and Shortell, 1989), it is rare for previous research to consider the effects of form on both responses and response effectiveness. Therefore, the current study also extends prior research by conducting a large-sample, longitudinal study to explicitly examine the interrelationships among

organizational form, responses to environmental change, and organizational performance. Specifically, this study investigates three general research questions:

1. Does a fit between emerging environmental conditions and organizational form relate to superior performance?
2. Do organizations that find their forms ill suited to emerging environmental conditions attempt to change their form to a more effective form?
3. What are the performance implications of making within-form vs. between-form moves toward a more preferred form for emerging environmental conditions?

These research questions will be examined within the context of the hospital industry in the state of Florida in the United States during the 1980s. This period represents something of a naturally occurring experiment where the entire competitive landscape shifted abruptly, with the introduction of the Medicare Prospective Payment System in 1983, making many hospitals poorly suited to their new, emerging competitive context.

Miles and Snow's (1978) strategic types (Prospectors, Defenders, Analyzers, and Reactors) are used as composite measures of the organizational configurations of strategies, structures, and systems. Within the context of the hospital industry, Prospectors are generally concerned with the location and development of market opportunities, avoidance of commitment to a single type of technological process, and facilitation of flexibility in organizational operations. Conversely, Defenders typically concern themselves with creating a stable set of products and customers, producing and delivering goods and services as efficiently as possible, and maintaining strict controls to ensure that efficiency (Miles *et al.*, 1978). Analyzers can be defined as organizational forms that focus on product/market breadth and growth in ways similar to the Prospectors, but simultaneously concern themselves with operational efficiency in a way similar to the Defender form of organization. Miles and Snow (1978) state that Reactors represent a 'residual' type of behavior in that organizations are forced into this response mode when they are unable to pursue one of the three stable strategies of Analyzer, Defender, or Prospectors. Based on this definition, and in line with the conclusions

of Doty, Glick, and Huber (1993), Reactors are defined in the current study as those organizations that fail to achieve a coherent configuration among strategic variables.

## HYPOTHESES

Previous research in the health care literature has suggested that the emerging context in the hospital industry of the 1980s emphasized both cost containment and the adoption of new technologies and services (Shortell *et al.*, 1990) and could be characterized as undergoing a fundamental and discontinuous shift (Meyer, Brooks, and Goes, 1990). Such contingencies would seem to favor the Analyzer and Prospector forms (Zajac and Shortell, 1989). The introduction of the Medicare Prospective Payment System in 1983 created such uncertain environmental conditions in the hospital industry during the 1980s. Thus, it can be theorized that hospitals that were Analyzers or Prospectors before the change and did not change their form would outperform Defender or Reactor hospitals that remained within their form throughout the period. Thus, the following is hypothesized:

*Hypothesis 1a: Organizations that are Analyzers prior to the environmental shift and do not change their form will have higher performance subsequent to the environmental shift than Defenders or Reactors that do not change their form.*

*Hypothesis 1b: Organizations that are Prospectors prior to the environmental shift and do not change their form will have higher performance subsequent to the environmental shift than Defenders or Reactors that do not change their form.*

It can also be theorized that if organizations are performing well prior to the environmental shift of interest and their organizational form is suited to the emerging environmental conditions, maintaining their current form will lead to higher performance than changing to another form. This argument suggests the following hypotheses:

*Hypothesis 2a: Organizations that are Analyzers prior to the environmental shift and*

*remain Analyzers will have higher performance subsequent to the environmental shift than Analyzers that change to another form.*

*Hypothesis 2b: Organizations that are Prospectors prior to the environmental shift and remain Prospectors will have higher performance subsequent to the environmental shift than Prospectors that change to another form.*

As not all organizational forms will be appropriately matched to a given environment (Hambrick, 1983), it is expected that some organizations will attempt to shift away from their prevailing forms in an attempt to adapt to emerging environmental conditions. Zajac and Shortell (1989) found that a preponderance (55%) of organizations changed form in response to a common environmental shift. Further, they found significantly more organizations following the Analyzer and Prospectors forms after the environmental shift, with the Analyzer being the preferred form. Their findings reveal that organizations respond to environmental shifts in ways that move them toward the more innovative forms. This leads to the following hypothesis:

*Hypothesis 3: Organizations will respond to the environmental shift in ways consistent with the Analyzer or Prospector forms.*

It can be reasoned that those firms which are able to establish the necessary competencies and configurations of strategy, structure, and processes associated with an organizational form that is more effective in a given environment should be better off than those organizations that are unable or unwilling to respond in an environmentally appropriate way. This position is supported by the traditional premise that firms seek to align organizational resources and capabilities with external opportunities and challenges (cf. Andrews, 1971; Hofer and Schendel, 1978) and that an effective alignment has positive performance implications (Ketchen *et al.*, 1997; Powell, 1992; Van de Ven and Drazin, 1985; Venkatraman, 1990; Venkatraman and Prescott, 1990). This position is also supported by the adaptive view of organizations which argues that firms are able to overcome the inertia of previous strategies. Thus, it is theorized that organizations which are willing and able to change to an organizational form that

is more effective in a given environment should be better off than those organizations which are unable or unwilling to respond in an environmentally appropriate way. Specifically, it is hypothesized that:

*Hypothesis 4a: Organizations that are Reactors prior to the environmental shift and change to the Analyzer form will have higher performance subsequent to the environmental shift than Reactors that do not change their form.*

*Hypothesis 4b: Organizations that are Reactors prior to the environmental shift and change to the Prospector form will have higher performance subsequent to the environmental shift than Reactors that do not change their form.*

*Hypothesis 4c: Organizations that are Defenders prior to the environmental shift and change to the Analyzer form will have higher performance subsequent to the environmental shift than Defenders that do not change their form.*

*Hypothesis 4d: Organizations that are Defenders prior to the environmental shift and change to the Prospector form will have higher performance subsequent to the environmental shift than Defenders that do not change their form.*

It should be noted, however, that not all organizations are willing or able to make a between-form change to an organizational form that is better suited to the emerging environment. Organizations that are unwilling or unable to make a between-form change have two alternative courses of action. One course of action is to respond (i.e., within their existing form) in a manner that is consistent with their existing form. The second alternative course of action is to respond (i.e., within their existing form) to the environmental shift in a manner that is consistent with another organizational form (such as the Analyzer or Prospector form) in an attempt to move toward that form. It can be theorized that although an organization may respond to an environmental shift in the direction of another form these moves may not have adaptive conse-

quences that result in greater performance. This is because it is possible that firms attempting to move toward different forms may fail to establish the necessary competencies (Snow and Hrebiniak, 1980) and configurations of strategy, structure, and processes (Miles and Snow, 1978) that are necessary for the firm to improve its performance. Thus, simply attempting moves toward the more effective form in a given environment may not assure that the organization's performance will benefit from the changes. This may be particularly true if the organization responds in ways considered outside its strategic comfort zone (Shortell et al., 1990). Using Hinings and Greenwood's (1988) terminology, these firms would be considered in an embryonic or schizoid state of transformation where performance is undoubtedly sub-par. Thus, it can be theorized that if an organization responds to an environmental shift in ways consistent with an organizational form that is better suited to the emerging environment, but is unable to establish the necessary competencies and configurations of strategy, structure, and processes to make a between-form change, the organization's performance may not be enhanced. This leads to the following hypotheses:

*Hypothesis 5a: Organizations that are Reactors prior to the environmental shift and respond within their form in ways consistent with the behavior of Analyzers or Prospectors will not perform any better subsequent to the environmental shift than Reactors that do not respond in ways consistent with Analyzers or Prospectors.*

*Hypothesis 5b: Organizations that are Defenders prior to the environmental shift and respond within their form in ways consistent with the behavior of Analyzers or Prospectors will not perform any better subsequent to the environmental shift than Defenders that do not respond in ways consistent with Analyzers or Prospectors.*

## METHODOLOGY

### Sample and data

The sample ( $N = 235$ ) used in the current study includes all short-term, acute-care hospitals in the state of Florida. Health care organizations have



served as the research setting for numerous studies of organizational adaptation to environmental change. This can be attributed at least partly to the notion that the introduction of the Medicare Prospective Payment System in 1983 provides a good illustration of a revolutionary environmental event that changed the basis of competition within the industry (Blair and Boal, 1991; Irwin, Hoffman, and Lamont, 1998; Marlin, Lamont, and Hoffman, 1994; Meyer *et al.*, 1990; Shortell *et al.*, 1990; Shortell, Morrison, and Robbins, 1985). Further, the selection of a single industry setting served to control for industry effects that may confound the results (Dess, Ireland, and Hitt, 1990). Finally, the sample was restricted to those organizations within the state of Florida for two reasons: (1) comprehensive archival data were readily available because state regulatory agencies require that all organizations report uniform measures; and (2) the use of firms concentrated within one state controlled for differences in regulations across multiple state environments (Blair and Boal, 1991; Zajac and Shortell, 1989).

Data were drawn from archival sources, including the *AHA Guide to the Health Care Field* published annually by the American Hospital Association and *Hospital Financial Data* published annually by Florida's Hospital Cost Containment Board in affiliation with the Agency for Health Care Administration. One specific benefit gained from the use of these secondary data sources was their consistency across the sample of organizations (i.e., the effects of differences in accounting and reporting procedures were minimized). In addition, the necessity in this study of a longitudinal research design relying upon historical data diminished the utility of self-typing and retrospective external assessments which limit the generalizability of the Zajac and Shortell (1989) study (See Golden, 1992, for a discussion of the limitations of retrospective external assessments).

### Classification of organizational form

Organizations in the sample were classified in terms of Miles and Snow's (1978) strategic types. The organizational forms described in detail by Miles and Snow (1978) and Miles *et al.* (1978) have received much attention by researchers in recent years (Doty *et al.*, 1993; Segev, 1989; Shortell and Zajac, 1990; Thomas and Rama-

swamy, 1996; Zahra and Pearce, 1990) and are prominent in the strategic management literature (cf. Hambrick, 1983; Miles and Cameron, 1982; Snow and Hrebiniak, 1980; Zajac and Shortell, 1989).

Miles and Snow's (1978) strategic types were operationalized in a way that highlighted their major differences in terms of costs, service offerings, and operating slack. Cost was assessed by three measures: (1) total expenses divided by the average number of occupied beds, (2) cost per adjusted patient day, and (3) salary per adjusted patient day. As expected, strong positive correlations were found among the three cost measures. Factor analysis revealed that the variables loaded on one factor, using the traditional eigenvalue cut-off criterion of 1.0 (see Appendix). Evidence from both the factor analyses and the correlation analysis warranted combining the three cost measures into one composite cost variable. The three cost measures were then standardized (mean = 0 and standard deviation = 1) and summed for an overall measure of cost (COSTS). The correlations for the applicable measures in this study are presented in Table 1.

Operating slack (OS) was measured by the ratio of employees per adjusted patient day. By operationalizing slack in this manner, the variable captures an assessment of the hospital's relative investment in people, a critical slack resource for innovation in patient care.

The amount of service offerings (SO) was measured by the average number of services offered by each organization. Consistent with previous control procedures (cf. Judge and Zeithaml, 1992; Marlin *et al.*, 1994) and to correct for the varying degrees of discretion afforded to hospital administrators operating in organizations of different sizes, the number of services offered by each hospital in each year was divided by the log of the organization's size, measured by total revenues.

The form measures were gathered over the years 1981–83 and averaged to obtain scores for each organization in the overall sample. Consistent with previous work (Thomas, Clark, and Gioia, 1993), averages were used to guard against undue influence by outliers. To identify the organizational forms present in the sample, the hospitals were grouped along the form measures using cluster analysis. The data were preprocessed using the ACECLUS procedure available in SAS

Table 1. Descriptive statistics and correlation coefficients

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1 Costs	0.000	1.000										
2 Operating slack	0.009	0.002	0.502***									
3 Services offered	19.510	7.940	0.539***	0.337***								
4 Change in costs per ave. patient day	-3.980	106.430	0.098	0.099	-0.015							
5 Change in sales per ave. patient day	-1.747	69.110	0.084	-0.05	0.003	0.522***						
6 Change in ttl. equity per ave. no. of beds	-2E05.000	3E04.000	0.354***	0.358***	0.275***	0.104**	0.02**					
7 Change in costs	0.000	2.070	0.259***	0.194***	0.124	0.785***	0.744***	0.543***				
8 Change in operating slack	-0.001	0.002	-0.069	-0.174**	-0.043†	0.604***	0.535***	-0.209**	0.449***			
9 Change in services offered	0.401	4.280	-0.058	-0.012	0.027	0.099	0.051	0.036	0.082	0.041		
10 Net operating rev. before env. change	-448.250	48323.000	0.738***	0.361***	0.478***	0.061	0.063	0.283***	0.196**	-0.068	0.021	
11 Occupancy rate before env. change	-0.040	14.220	-0.585**	-0.085	0.404***	0.036	0.115†	0.219**	0.179**	0.034	0.048	0.458***
12 Operating margin before env. change	-0.321	17.664	0.008	-0.108	0.138*	0.011	-0.05	0.245***	0.099	-0.11†	0.009	0.174**
13 Total margin before env. change	-0.090	6.110	0.211**	-0.19**	0.27***	-0.004	-0.061	0.084**	0.009	-0.043	0.055	0.216**
14 Total revenue before env. change	-6.550	121.160	0.632***	0.54***	0.424***	0.074	-0.046	0.217**	0.118†	-0.195**	-0.065	0.507***
15 Performance before env. change	0.000	3.260	0.663***	0.156*	0.528***	0.051	0.005	0.325***	0.184**	-0.121†	0.019	0.722***
16 Net operating rev. after env. change	-2095.000	70170.000	0.741***	0.521***	0.458***	0.120†	0.018	0.693***	0.401***	-0.135*	0.031	0.565***
17 Occupancy rate after env. change	-0.383	16.790	0.46***	0.109	0.474***	-0.159*	-0.064	0.56***	0.163*	-0.146*	0.056	0.389***
18 Operating margin after env. change	-1.050	30.690	0.063	0.144*	0.181***	-0.122†	-0.159*	0.118†	-0.079	-0.228**	0.095	0.129†
19 Total margin after env. change	-1.030	16.870	0.127	0.036	0.205**	-0.31***	-0.138*	0.209**	-0.115†	-0.179**	-0.073	0.086
20 Total revenue after env. change	-8.320	290.860	0.622***	0.522***	0.402***	0.231***	0.058	0.313***	0.291***	-0.075	0.023	0.463***
21 Performance after env. change	0.000	3.433	0.586***	0.384***	0.503***	-0.070	-0.083	0.55***	0.191**	-0.222**	0.053	0.475***
22 Organizational size	5.055	0.861	0.457**	0.262**	0.847**	0.031	0.032	0.249**	0.150*	-0.061	0.124	0.444**

Table 1. Descriptive statistics and correlation coefficients (cont.)

	11	12	13	14	15	16	17	18	19	20	21
1 Costs											
2 Operating slack											
3 Services offered											
4 Change in costs per ave. patient day											
5 Change in sales per ave. patient day											
6 Change in ttl. equity per ave. no. of beds											
7 Change in costs											
8 Change in operating slack											
9 Change in services offered											
10 Net operating rev. before env. Change											
11 Occupancy rate before env. Change											
12 Operating margin before env. Change	0.144*										
13 Total margin before env. Change	0.457***	0.41***									
14 Total revenue before env. Change	0.091	0.227***	0.162*								
15 Performance before env. Change	0.661***	0.598***	0.681***	0.607***							
16 Net operating rev. after env. Change	0.452***	0.226**	0.247***	0.573***	0.632***						
17 Occupancy rate after env. Change	0.57***	0.092	0.227**	0.135*	0.43***	0.618***					
18 Operating margin after env. Change	0.097	0.469***	0.149*	0.289***	0.352***	0.365***	0.114†				
19 Total margin after env. Change	0.172**	-0.014	0.149*	0.005	0.122†	0.293***	0.425***	0.426***			
20 Total revenue after env. Change	0.125†	0.187**	0.103	0.839***	0.529***	0.633***	0.129†	0.293***	0.099		
21 Performance after env. Change	0.413***	0.28***	0.255***	0.536***	0.601***	0.847***	0.666***	0.64***	0.653***	0.627***	
22 Organizational size	0.392**	0.287**	0.302**	0.537**	0.614**	0.455**	0.395**	0.323**	0.147**	0.470**	0.521**

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

and Ward's minimum variance method for clustering the factor scores as the first step in a two-stage cluster analysis. The following decision criteria were used to identify the optimal cluster solutions: (1) a local peak in the Cubic Clustering Criterion with (2) a local peak in the pseudo  $F$  statistic combined with (3) a small value of the pseudo  $t^2$  statistic and a larger pseudo  $t^2$  statistic for the next cluster fusion, and (4) an additional cluster increasing the overall fit by less than 5 percent with (5) the clusters obtained explaining at least 65 percent of the overall variance. These decision criteria are consistent with those used in prior strategy research (i.e., Fiegenbaum and Thomas, 1990; Ketchen and Shook, 1996; Mehra, 1996) and with cluster stopping rules recommended by the SAS manual and by the SAS Technical Report A-108.

The second stage of the clustering procedure used the seed values obtained from Ward's clustering method as the initial seeds for an iterative partitioning clustering procedure (i.e., the FASTCLUS procedure also available in SAS). To ensure that the results were not an artifact of the clustering method chosen, the same analyses were performed using different clustering methods (i.e., Average, Centroid, and Median) with no meaningful differences in hierarchical structure and final cluster assignments. Next, MANOVAs were run on the identified clusters to examine whether the clusters differed on the underlying variables and ANOVAs and Tukey comparisons were performed to establish the dimensions on which the clusters differed.

The cluster analyses resulted in a total of five clusters based on the statistical analyses. After evaluating these clusters on theoretical dimensions, the fifth cluster was determined to be a subset of one of the other clusters. This process ultimately classified the original sample of 235 into four groups, comprised of 17 Prospectors, 50 Defenders, 63 Analyzers, and 105 Reactors. The theoretical dimensions and decision criteria for classifying each organizational form are presented in Table 2. The results from the cluster analysis and the cluster means are shown in Table 3.

### Environmental change

As discussed, the environmental change investigated in this study was the 1983 introduction of the Medicare Prospective Payment System

(MPPS), an environmental event used by previous investigations of organizational adaptation. Under the MPPS cost containment program, hospitals are reimbursed a predetermined amount per case type of diagnosis-related group (DRG); this departs dramatically from the previous system in which hospitals were reimbursed on a retrospective cost basis (Chulis, 1991; Sloan, Morrissey, and Valvona, 1988). Since Medicare patients represent 40 percent of all hospital admissions, the introduction of the MPPS had a major impact on hospital operations in terms of revenue and number of patients admitted (Zajac and Shortell, 1989). The introduction of MPPS and the concurrent changes by private insurers forced hospital administrators to recognize and contend with strategic issues (Blair and Whitehead, 1988; Thomas and McDaniel, 1990); such strategic thinking was relatively novel in the hospital industry (Hein and Glazer-Waldman, 1988). Thus, hospitals were forced to realign themselves to adapt to the environmental changes (Ginn, 1990; Meyer *et al.*, 1990; Shortell *et al.*, 1990; Smith, Piland, and Phillipp, 1991).

### Between-form responses to environmental change

To examine between-form changes, the aforementioned clustering techniques used to classify the hospitals *prior to* the introduction of MPPS were used to determine the strategic form of each hospital *after* the environmental shift. By comparing each hospital's strategic form before the environmental shift to its strategic form after the environmental shift, we were able to identify which hospitals changed form and the alternative form to which they changed. For example, if a hospital was classified as a Defender before the environmental shift and an Analyzer afterwards, the hospital was considered as changing its form, a between-form response to the environmental event. However, as a further example, if the hospital was classified as a Defender in both time periods, its changes in costs, service offerings, and slack investments were considered as within-form responses. The results from the post-environmental shift cluster analysis are shown in Table 3 along with the results from the pre-environmental shift cluster analysis. The movements between strategic forms over the time of the environmental shift are presented in Table 4.



Table 2. Clustering decision criteria

Strategic form	Theoretical dimensions		
	Costs	Services offered	Operating slack
Prospector	Highest	Highest	Highest
Defender	Lowest	Lowest	Lowest
Analyzer	Contained (i.e., close to grand mean and much lower than Prospector's costs)	High (i.e., approaching the number that Prospectors offer)	Close to the grand mean and much lower than Prospector's
Reactor	Approximating grand mean	Approximating grand mean	Approximating grand mean

Table 3. Results from cluster analyses

Cluster	N	Costs	Services offered	Operating slack	Form
Before environmental shift					
1	16	2.184	25	0.0110	Prospector
2	50	-1.298	12	0.0079	Defender
3	63	0.746	25	0.0096	Analyzer
4	105	-0.182	19	0.0090	Reactor
5	1 <sup>a</sup>	2.365	22	0.0115	Prospector
Grand mean		0.000	19	0.0091	
After environmental shift					
1	44	1.440	28	0.0121	Prospector
2	49	-1.203	13	0.0111	Defender
3	67	0.253	24	0.0107	Analyzer
4	62	-0.437	20	0.0101	Reactor
5	4 <sup>a</sup>	1.625	24	0.0131	Prospector
Grand mean		0.000	21	0.0110	

<sup>a</sup> Note that the fifth cluster was incorporated into the Prospector form. This decision was based on its theoretical membership in that group instead of the statistical basis for five clusters (Ketchen and Shook, 1996)

Table 4. Number of Analyzers, Prospectors, Defenders, and Reactors before and after the environmental shift

Form before environmental shift	Form after environmental shift					
	Number of Analyzers	Number of Prospectors	Number of Defenders	Number of Reactors	Number of missing	Total number before the env. shift
Number of Analyzers	26	28	1	8	0	63
Number of Prospectors	2	12	0	2	1	17
Number of Defenders	1	0	32	12	5	50
Number of Reactors	38	8	16	40	3	105
Number of missing	0	0	0	0	0	0
Total number after the env. shift	67	48	49	62	9	235

### Within-form responses to environmental change

Within-form organizational responses were examined in terms of the *changes within* the same three variables that were used to classify organizational form (i.e., costs: CHGCOSTS; services: CHGSO; and operating slack: CHGOS). Changes in each of the three variables for each organization in the sample were measured in the years 1984 and 1988, so difference scores could be used to measure organizational responses to the environmental event. These change measures were then linked to the response repertoires of each organizational form.

Based on the definitions discussed earlier regarding each of Miles and Snow's (1978) strategic types, it can be reasoned that attempts to control costs and increase operating efficiency would correspond to the Defender form, while higher cost scores are more consistent with the Prospector form. It can also be reasoned that changes in service offerings signified an attempt to alter the service portfolio; expansion of services (indicative of the Prospectors form) would signify an attempt to add services not currently available in the market. Contraction of services (indicative of the Defender form) in response to environmental change would signify an attempt to focus on the core services offered by the hospital and eliminate those that may be used rarely and/or offered by other hospitals in close geographic proximity.

In terms of the operating slack change response, it is reasoned that decreases in operating slack indicated attempts to cut activities that may not contribute directly to patient care and hospital administration and/or were beyond the scope of the core domain and are consistent with the Defender form. Increasing operating slack, consistent with the Prospector form, signified investing more intensely in innovations and human resources, perhaps in an effort to enter untapped markets or to increase the flexibility of organizational operations.

Analyzers are generally posited to possess characteristics similar to both Prospectors and Defenders. Given the nature of the Analyzer form and aforementioned changes in the industry environment, it is reasoned that the appropriate responses for Analyzers would be attempts to enter new markets while also emphasizing the

efficiency of operations. In our study, these actions would be indicated by the addition of new services and the simultaneous containment of costs. It is also conceivable that such changes in the service offerings and cost structure would necessitate concomitant reduction in operating slack. Thus, increases in services, containment of costs, and decreases in operating slack appear to be consistent with the Analyzer form and were considered appropriate responses for the emerging environmental conditions.

In sum, increases along the three response dimensions would be consistent with the Prospector form, while decreases along the dimensions would be consistent with the Defender form. Increases in services, containment of costs, and decreases in operating slack would be consistent with the Analyzer form.

Because the 1980s involved numerous changes throughout the hospital industry, (e.g., Blair and Boal, 1991; Ginn, 1990), it was important to control for time effects. The spiraling health care costs and numerous technological and service innovations that characterized the decade prompted the *a priori* expectation that costs and service breadth would generally increase while operating slack would generally decrease over the time frame of the study, regardless of actions taken by hospital decision-makers.

These assumptions were tested by a series of *t*-tests with Duncan's multiple range test controls; the results indicated that all of the response measures except that of services show significant changes across the overall sample between the years 1984 and 1988. Thus, these variables were adjusted for trends in the data by subtracting the sample mean from each organization's score in each of the years. The 1984 mean value for each of the response scores was subtracted from each hospital's 1984 scores; likewise, the 1988 mean value for each of the response scores was subtracted from each hospital's 1988 scores. By subtracting these constants from each hospital's 1984 and 1988 scores, each of the variables was corrected for trends in the data that were beyond the control of hospital administrators. Subtracting the adjusted 1984 values from the adjusted 1988 values thus derived the response scores for each hospital. With these adjustments, each organization's scores on each of the variables represented its responses relative to the industry trends within the sample of organizations.

### Organizational performance

A composite performance measure was generated with five indicators: total margin (TM), operating margin (OM), total revenue relative to adjusted patient days (TR), the ratio of net operating revenue to the total number of beds for each hospital (NOR), and percent occupancy (OCC). These performance measures are consistent with those employed by Friedman and Shortell (1988) and Marlin *et al.* (1994).

Performance measures were gathered prior to the environmental shift (1981–83) so that prior performance could be controlled for in the study. The same performance measures were also gathered after the response period (1988–90) to assess the performance effects of organizational responses. The 1988–90 time frame was chosen because it was believed to allow sufficient time for the performance effects of the organizations' responses to be realized. Previous research provides evidence that performance effects of organizational changes are not felt immediately, but rather are experienced in later years (Hoffman, Carter, and Cullen, 1994).

The average values of each performance measure over the years 1981–83 and 1988–90 were used in an attempt to smooth out yearly fluctuations in performance and mitigate the problems associated with missing data. On average, no single variable used in the data reduction methods had more than 10 percent missing data. The worst case for missing data was with the number of services offered, a variable which had 10 percent missing. Missing data were due to various hospitals' failure to report to the targeted health care agencies.

An examination of correlation matrices, in both the prior performance period and the outcome period, revealed preliminary evidence that the variables could be combined to form a composite measure of performance. Factor analyses revealed a similar pattern, with the performance variables loading on one distinguishable factor with an eigenvalue greater than 1.0, in both the prior performance period and the outcome period (see Appendix). The five performance measures were then standardized (mean = 0 and standard deviation = 1) and summed to yield a composite measure of prior performance (PERFB4) and outcome performance (PERFAFT). The factored variables explained 68 percent of the variance in

the prior performance period and 59 percent of the variance in the outcome years.

Similar to assumptions made regarding the response scores, the numerous changes within the hospital industry throughout the 1980s led to the *a priori* expectation that performance among the hospitals in the study would generally decline over the years of interest. This assumption was tested by comparing the performance variables prior to the environmental shift (an average of 1981–83) to the performance variables in the outcome years (an average of 1988–90) through a series of *t*-tests with Duncan's multiple range test controls. Results indicated that the Cochran approximations are significant for all of the performance variables. Thus, each organization's scores for the five performance variables were adjusted for time trends in the data by subtracting the sample mean for each measure from the organization's raw scores. This procedure mirrored the previously discussed approach taken to adjust the response scores for time trends in the data. With these adjustments, the performance measures used in subsequent analyses reflected each hospital's performance relative to that of all organizations in the sample.

As can be seen in Table 1, performance before and after the environmental change was positively correlated with the variables used to identify organizational form: costs, operating slack, and services. For the post-environmental change period, this is very much in line with our expectation that Prospectors and Analyzers (scoring average to high on all three classification measures) would be the higher performers whereas the Reactors and Defenders (scoring average to low on all three measures) would be the low performers. A similar correlation pattern found in the pre-environmental change period was unexpected, but not entirely surprising given the level of innovation characterizing the Prospectors, in particular, and the lack of strategic focus of the Reactors. It should also be noted that the number of Prospectors and Reactors underlying the observed correlation patterns in the pre and post periods were dramatically different, as can be seen in Tables 3 and 4. This is very consistent with the common assertion that the introduction of the MPPS in 1983 was a major discontinuity requiring many hospitals to realign themselves with the emerging context.

In order to remain consistent with prior

research (e.g., Blair and Boal, 1991; Irwin *et al.*, 1998; Shortell *et al.*, 1990) several variables were controlled for in addition to the hospital's performance prior to the environmental shift. These variables included organizational size (i.e., measured by the average number of beds), and a series of dummy variables for whether the hospital was profit or not-for-profit; whether the hospital was a member of a system or network vs. being free-standing; whether the hospital was a teaching institution; and whether the hospital was in an urban or rural setting.

## RESULTS

ANOVA was used to test Hypothesis 1a, that Analyzers prior to the environmental shift that do not change their form will have higher performance after the environmental shift than Defenders or Reactors that do not change their form. Support for this hypothesis was found. The mean performance after the environmental shift for the Analyzers that remained Analyzers was statistically significant and greater than the Defenders that remained Defenders ( $p = 0.048$ ) (see Table 5) and the Reactors that remained Reactors ( $p = 0.049$ ) (see Table 6).

ANOVA was also utilized to test Hypothesis 1b that Prospectors prior to the environmental shift that do not change their form will have higher performance after the environmental shift

than Defenders or Reactors that do not change their form. This hypothesis was also supported. The mean performance after the environmental shift for the Prospectors that remained Prospectors was statistically significant and greater than the Defenders that remained Defenders ( $p = 0.002$ ) (see Table 7) and the Reactors that remained Reactors ( $p = 0.006$ ) (see Table 8).

ANOVA was also used to test Hypotheses 2a and 2b. Support was found for Hypothesis 2a, that organizations which are Analyzers prior to the environmental shift and remain Analyzers will have higher performance subsequent to the environmental shift than Analyzers that change to another form. The mean performance after the environmental shift for the Analyzers that remained Analyzers was statistically significant and greater than Analyzers which changed to another form ( $p = 0.002$ ) (see Table 9).

Support was also found for Hypothesis 2b that organizations that are Prospectors prior to the environmental shift and remain Prospectors will have higher performance subsequent to the environmental shift than Prospectors that change to another form. The mean performance after the environmental shift for the Prospectors that remained Prospectors was statistically significant and greater than for Prospectors which changed to another form ( $p = 0.003$ ) (see Table 10).

In testing Hypothesis 3, that organizations would respond to the environmental shift in ways consistent with the Analyzer or Prospector form, the

Table 5. Results of analysis of variance for effects of between-form change on organizational performance after the environmental shift for Analyzers staying Analyzers vs. Defenders staying Defenders

Source of variance	Mean square	d.f.	F	p
Covariates combined	8.314	5	1.723	0.073†
Prior performance	20.492	1	4.247	0.022*
Multiple hospital affiliation	3.324	1	0.689	0.205
Profit or not for profit	1.632	1	0.338	0.281
Rural or urban	0.191	1	0.040	0.421
Teaching institution <sup>a</sup>				
Organizational size	16.403	1	3.400	0.036*
Performance after the environmental shift × strategic form (Analyzers vs. Defenders)	12.700	1	2.632	0.048*
Explained variance	52.979	6	10.981	0.000***
Residual variance	4.825	49		
Total variance	10.078	55		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

<sup>a</sup>For this analysis, these variables resulted in a singular matrix and are therefore not included.

Table 6. Results of analysis of variance of the effects of between-form change on organizational performance after the environmental shift for Analyzers staying Analyzers vs. Reactors staying Reactors

Source of variance	Mean square	d.f.	F	P
Covariates combined	10.892	5	1.578	0.090†
Prior performance	10.016	1	1.452	0.116
Multiple hospital affiliation	9.337	1	1.353	0.124
Profit or not for profit	0.002	1	0.002	0.484
Rural or urban	11.737	1	1.701	0.096†
Teaching institution <sup>a</sup>				
Organizational size	25.416	1	3.683	0.030*
Performance after the environmental shift	16.096	1	2.333	0.049*
performance × strategic form (Analyzers vs. Reactors)				
Explained variance	19.412	6	2.813	0.009**
Residual variance	6.900	59		
Total variance	8.055	65		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ <sup>a</sup>For this analysis, these variables resulted in a singular matrix and are therefore not included.

Table 7. Results of analysis of variance of the effects of between-form change on organizational performance after the environmental shift for Prospectors staying Prospectors vs. Defenders staying Defenders

Source of variance	Mean square	d.f.	F	p
Covariates combined	9.074	6	1.204	0.164
Prior performance	49.440	1	6.561	0.007**
Multiple hospital affiliation	10.187	1	1.352	0.146
Profit or not for profit	2.416	1	0.321	0.284
Rural or urban	0.003	1	0.005	0.473
Teaching institution	6.550	1	0.869	0.174
Organizational size	14.094	1	1.870	0.090†
Performance after the environmental shift	70.056	1	9.297	0.002**
× strategic form (Prospectors vs. Defenders)				
Explained variance	90.974	7	12.072	0.000***
Residual variance	7.536	34		
Total variance	21.781	41		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ 

responses of each of the strategic forms were examined through means analysis. Those organizations that emerged from the environmental shift with a strategic form of either Analyzer or Prospector were compared to those organizations that emerged with a Reactor or Defender form. There was a statistically significant ( $p < 0.001$ ) and greater number of Analyzers and Prospectors after the environmental shift than there were before the environmental shift. Therefore this hypothesis is supported.

As mentioned earlier, the movements between strategic forms over the time of the environmental shift are presented in Table 4. These results

suggest other noteworthy aspects about the patterns of change from one form to another that deserve mention. As indicated by the table, Prospectors changed the least while Reactors changed the most. Both findings are consistent with the expectation that Prospectors fit to the emerging context, whereas the Reactors are incoherent forms and mismatched to the new industry conditions. Many of the Analyzers changed to Prospectors, a different, but still appropriate form for the rapidly changing industry. Surprisingly, in light of the findings of Zajac and Shortell (1989), the Defenders were found to change very little;



Table 8. Results of analysis of variance of the effects of between-form change on organizational performance after the environmental shift for Prospectors staying Prospectors vs. Reactors staying Reactors

Source of variance	Mean square	d.f.	F	p
Covariates combined	6.986	6	0.680	0.333
Prior performance	16.609	1	1.616	0.105
Multiple hospital affiliation	15.924	1	1.549	0.110
Profit or not for Profit	0.488	1	0.048	0.414
Rural or urban	7.331	1	0.713	0.201
Teaching institution	2.145	1	0.209	0.325
Organizational size	0.216	1	0.021	0.442
Performance after the environmental shift	68.495	1	6.663	0.006**
performance $\times$ strategic form (Prospectors vs. Reactors)				
Explained variance	49.932	7	4.857	0.000***
Residual variance	10.281	44		
Total variance	15.723	51		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

Table 9. Results of analysis of variance of the effects of between-form change on organizational performance after the environmental shift for Analyzers not changing form vs. Analyzers that changed

Source of variance	Mean square	d.f.	F	p
Covariates combined	59.189	3	27.940	0.000***
Prior performance	84.564	1	39.918	0.000***
Multiple hospital affiliation <sup>a</sup>				
Profit or not for profit	1.239	1	0.585	0.224
Rural or urban <sup>a</sup>				
Teaching institution <sup>a</sup>				
Organizational size	36.957	1	17.445	
Performance after the environmental shift	17.887	1	8.444	0.002**
$\times$ strategic form (Analyzers vs. Changers)				
Explained variance	47.708	4	22.520	0.000***
Residual variance	2.118	58		
Total variance	5.060	62		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

<sup>a</sup>For this analysis, these variables resulted in a singular matrix and are therefore not included.

and only one changed in an adaptive direction. Still, this is consistent with recent case evidence (Fox-Wolfgramm *et al.*, 1998) suggesting that Defenders may be the least likely of forms to both notice needed changes and to successfully implement them when they involve enduring transformation.

ANOVA was utilized to test Hypothesis 4a, that Reactors prior to the environmental shift that change to the Analyzer form will have higher performance after the environmental shift than Reactors that do not change to the Analyzer form. Results in Table 11 show that the Reactors that changed to the

Analyzer form had statistically significant ( $p = 0.001$ ) higher performance after the environmental shift than Reactors that did not change their form. Thus, Hypothesis 4a is supported.

Results also support Hypothesis 4b that Reactors prior to the environmental shift that change to the Prospector form will have higher performance after the environmental shift than Reactors that did not change their form. Table 12 shows that Reactors which changed to the Prospector form had statistically significant ( $p = 0.031$ ) higher performance after the environmental shift than Reactors that did not change their form.

Table 10. Results of analysis of variance of the effects of between-form change on organizational performance after the environmental shift for Prospectors not changing form vs. Prospectors that changed

Source of variance	Mean square	d.f.	F	P
Covariates combined	7.476	3	1.408	0.146
Prior performance	15.780	1	2.972	0.051†
Multiple hospital affiliation <sup>a</sup>				
Profit or not for profit	4.068	1	0.766	0.200
Rural or urban <sup>a</sup>				
Teaching institution <sup>a</sup>				
Organizational size	15.865	1	2.988	0.051†
Performance after the environmental shift	57.003	1	10.735	0.003**
× strategic form (Prospectors vs. Changers)				
Explained variance	20.417	4	3.845	0.017*
Residual variance	5.310	11		
Total variance	9.339	15		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ <sup>a</sup>For this analysis, these variables resulted in a singular matrix and are therefore not included.

Table 11. Results of analysis of variance of the effects of between-form change on organizational performance after the environmental shift for Reactors to Analyzers vs. Reactors staying Reactors

Source of variance	Mean square	d.f.	F	p
Covariates combined	12.072	5	1.834	0.058†
Prior performance	3.417	1	0.519	0.137
Multiple hospital affiliation	31.934	1	4.852	0.016†
Profit or not for profit	1.028	1	0.156	0.347
Rural or urban	6.869	1	1.044	0.160
Teaching institution <sup>a</sup>				
Organizational size	8.073	1	1.227	0.236
Performance after the environmental shift	69.205	1	10.516	0.001**
× strategic form (Reactor changing to Analyzer vs. Reactors remaining Reactors)				
Explained variance	21.445	6	3.258	0.003**
Residual variance	6.581	71		
Total variance	7.739	77		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ <sup>a</sup>For this analysis, these variables resulted in a singular matrix and are therefore not included.

Since only one Defender changed to the Analyzer form and no Defenders changed to the Prospector form, lack of data precluded testing Hypotheses 4c and 4d that Defenders prior to the environmental shift that change to the Analyzer or Prospector form will have higher performance after the environmental shift than Defenders that do not change their form.

Multiple regression was used to test Hypothesis 5a, that Reactors prior to the environmental shift that respond within their form in ways consistent

with the behavior of Analyzers or Prospectors will not perform any differently subsequent to the environmental shift than Reactors that do not respond in ways consistent with Analyzers or Prospectors. The results shown in Table 13 indicate that change in costs was not statistically significant for Reactors. However, operating slack was statistically significant ( $p = 0.006$ ) in a negative direction (i.e., indicating that decreasing operating slack increased performance) and services offered was significant at the 0.10 level

Table 12. Results of analysis of variance of the effects of between-form change on organizational performance after the environmental shift for Reactors to Prospectors vs. Reactors staying Reactors

Source of variance	Mean square	d.f.	F	p
Covariates combined	13.766	5	1.099	0.183
Prior performance	3.774	1	0.301	0.293
Multiple hospital affiliation	26.252	1	2.097	0.071†
Profit or not for profit	0.003	1	0.000	0.494
Rural or urban	10.892	1	0.870	0.176
Teaching institution <sup>a</sup>				
Organizational size	15.346	1	1.226	0.137
Performance after the environmental shift × strategic form (Reactors changing to Prospectors vs. Reactors remaining Reactors)	46.471	1	3.711	0.031*
Explained variance	18.374	6	1.467	0.106
Residual variance	12.522	41		
Total variance	13.269	47		

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ <sup>a</sup>For this analysis, these variables resulted in a singular matrix and are therefore not included.

Table 13. Regression results for the effects of within-form responses on organizational performance after the environmental shift

	Beta	S.E.	t	p
<i>Reactors</i>				
Intercept	-0.007	0.753	-0.099	0.491
Prior performance	0.547	0.137	3.993	0.000***
Multiple hospital affiliation	-0.002	0.614	-0.029	0.497
Profit or not for profit	-0.002	0.317	-0.077	0.492
Rural or urban	-0.901	0.811	-1.112	0.136
Organizational size	0.002	0.002	1.122	0.234
Teaching institution	0.002	0.153	3.554	0.255
$R^2_{Adj} = 0.229$				
Costs	0.197	0.122	1.620	0.122
Operating slack	-511.234	177.000	-2.888	0.006**
Services offered	0.110	0.058	1.906	0.062*
$R^2_{Adj} = 0.363$				
<i>Defenders</i>				
Intercept	-3.507	1.896	-1.849	0.051†
Prior performance	0.202	0.332	0.607	0.280
Multiple hospital affiliation	0.851	1.382	0.616	0.272
Profit or not for profit	-0.322	0.718	-0.449	0.332
Rural or urban	0.004	1.774	0.022	0.492
Organizational size	0.002	0.015	1.138	0.144
Teaching institution	0.221	0.112	2.223	0.222
$R^2_{Adj} = 0.133$				
Costs	1.157	0.661	1.750	0.118
Operating slack	-492.890	325.479	-1.514	0.168
Services offered	-0.134	0.205	-0.655	0.266
$R^2_{Adj} = 0.153$				

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

( $p = 0.062$ ) in a positive direction. The combination of these two types of responses is consistent with the analyzer form. Thus, these results provide some evidence (at the 0.10 level of significance) that Reactors which respond within their form in ways consistent with the behavior of Analyzers perform better after the environmental shift than Reactors that do not respond in ways consistent with Analyzers or Prospectors.

Multiple regression was also used to test Hypothesis 5b that Defenders prior to the environmental shift that respond within their form in ways consistent with the behavior of Analyzers or Prospectors will not perform any better subsequent to the environmental shift than Defenders that do not respond in ways consistent with Analyzers or Prospectors. Results also shown in Table 13 indicate that costs, services offered, and operating slack are not statistically significant. These results indicate that Defenders prior to the environmental shift that respond within their form in ways consistent with the behavior of Analyzers or Prospectors do not perform any better after the environmental shift than Defenders that do not respond in ways consistent with Analyzers or Prospectors. Therefore Hypothesis 5b is also supported.

## DISCUSSION

The purpose of this study was to usefully extend our understanding of organizational form–performance relationships in an environmental context of considerable upheaval, where many, if not most, of the organizations were under pressure to radically transform themselves. Toward this end, we examined the adaptive and maladaptive responses of hospitals in Florida to a major external discontinuity, the introduction of the Medicare Prospective Payment System in 1983, that fundamentally and irrevocably altered the bases of competition in the industry. Further corroborating previous work (Meyer *et al.*, 1990; Meyer, Goes, and Brooks, 1994; Zajac and Shortell, 1989), we found that (1) most of the hospitals poorly matched to the new environmental context transformed themselves to a better-suited organizational form, and (2) these major transformations are not rare. In line with the results of some studies (cf., Fox-Wolfgramm *et al.*, 1998; Meyer, 1982; Zajac and Kraatz, 1993), but not others

(e.g., Zajac and Shortell, 1989), we also found that (3) Defenders appear least capable of usefully or easily changing their organizational form, and (4) staying with or moving to the organizational forms better suited to the new industry conditions has positive performance effects. In addition, and consistent with recent case evidence (e.g., Fox-Wolfgramm *et al.*, 1998) and theory (e.g., Hinings and Greenwood, 1988; Miller and Friesen, 1980, 1984), but never explicitly examined in a large sample study, we found that (5) some organizations' incomplete or aborted attempts to move toward environmentally favored forms produced no performance gains. Thus, this study contributes to our knowledge of how organizations respond to major environmental discontinuities by specifically examining both adaptive and maladaptive organizational responses.

We found support for Hypothesis 3, our single descriptive, as opposed to prescriptive, hypothesis. Most of the hospitals in our sample did respond to the environmental shift in ways characteristic of the Analyzer and Prospector forms, those forms considered most appropriately matched to the emerging industry conditions. That is, most of the hospitals remained or changed to the Analyzer and Prospector forms. This is consistent with prior evidence (Meyer *et al.*, 1990; Zajac and Shortell, 1989), but runs counter to the strongest arguments of organizational ecologists (e.g., Aldrich, 1979; Carroll, 1984; Hannan and Freeman, 1977) emphasizing the dominance of inertia in organizational processes. Apparently, when faced with a significant external discontinuity, many firms can acquire and redirect the resources and competencies needed to transform themselves into a better environmentally suited form. Still, the survivor bias built into our research design, and that of previous studies with similar findings, precludes definitive conclusions and presents opportunities for future research.

Two descriptive observations, while not hypothesized, deserve mention. First, transformations from one organizational form to another in a context of radical external change were not found to be rare events, as others have also observed (Meyer *et al.*, 1990; Tushman and Romanelli, 1985; Zajac and Shortell, 1989), although most of the adaptive transformations in our sample involved Reactors blossoming into more viable organizational forms. Given that the industry was much more benign before the environ-

mental shift in 1983 (Meyer *et al.*, 1990; Zajac and Shortell, 1989), where Reactors might flourish (Hrebiniak and Joyce, 1985), it is not surprising that many of the surviving Reactors were able to hone their competencies and transform themselves into more viable organizational forms. Still, given that Reactors are characterized by their inability to develop a coherent configuration of organizational features and actions (Doty *et al.*, 1993), and that most of the hospitals in our sample were Reactors prior to the environmental shift, the observed pattern of effective transformation by the Reactors is noteworthy.

Second, and in stark contrast to the apparently effective responses of many of the Reactors, was the apparent inability of most of the Defender hospitals to effectively transform themselves into the forms better matched to the emerging industry conditions. In fact, only one Defender hospital in our sample was able to do so. We did not expect this, given the ubiquitous transformations of Defender hospitals observed by Zajac and Shortell (1989) in their study. Perhaps methodological and sample differences between the two studies account for this discrepancy. Still, our results are very much in line with theory and anecdotal case evidence (Fox-Wolfgramm *et al.*, 1998; Meyer, 1982; Miles and Snow, 1978) indicating that Defenders are the least likely of all of the organizational forms to both notice the need to change and be able to overcome the competency and process constraints of their organizational form. That is, Defender organizations may be the least likely and most challenged to move outside their strategic comfort zones (Shortell *et al.*, 1990). The fact that many of the Defenders evolved into Reactors, an incoherent form, by the end of the time period of our study may further bolster this point. We may simply have caught the Defenders-turned-Reactors in the middle of a difficult transformation, in a schizoid state (Hinings and Greenwood, 1988). Obviously, more research over longer time horizons on the adaptability of Defenders confronted with environmental discontinuities seems useful.

Our prescriptive hypotheses, those linking organizational form and changes in form to performance (Hypotheses 1, 2, and 4), all received strong support. Generally, staying within or moving to an environmentally appropriate organizational form had positive performance effects. Analyzers and Prospectors that remained within

their forms outperformed Defenders and Reactors that did not change forms. They also outperformed the Analyzers and Prospectors that chose to change to a less environmentally suited organizational form. And the Reactors able to transform themselves into Analyzers or Prospectors were found to outperform the less well-adapted Reactors. Although the notion that matching organizational form to environmental context should be performance enhancing is not a new one to strategy or organization theorists (cf. Aldrich, 1979; Andrews, 1971; Galbraith and Kazanjian, 1986; Hofer and Schendel, 1978; Hinings and Greenwood, 1988; Miller and Friesen, 1980, 1984), it is not always supported (e.g., Zajac and Shortell, 1989). Our results provide strong and consistent support for this tenet underlying so much of organizational research.

Hypothesis 5, dealing with within-form responses to the environmental shift as opposed to between-form transformations, also received some support. Following configurational theory (e.g., Hinings and Greenwood, 1988), we expected only responses that produced coherent organizational forms to be performance enhancing. So, Reactors and Defenders that enacted changes appropriate to the emerging environmental conditions but failed to make a complete and coherent transformation to a new organizational form were not expected to achieve higher performance. Using configurational logic, these actions would take the organization to an embryonic or schizoid state in the transformation process where performance is not likely to be high. We found no performance differences between Defenders that took steps toward the Analyzer and Prospector forms and those that did not attempt such environmentally appropriate, but apparently insufficient, changes. This support for the importance of configurational coherence in enhancing performance in a context of environmental discontinuity seems rather novel in a large sample study. It would be important for future research to examine the boundary conditions of this finding.

As mentioned in the Results section, our findings provide some evidence that Reactors prior to the environmental shift that respond within their form in ways consistent with the behavior of Analyzers perform better after the environmental shift than Reactors that do not respond in ways consistent with Analyzers or Prospectors.



Although these findings are not conclusive (i.e., only significant at the 0.10 level) they do give additional support to the idea that Reactors seem better able than defenders to respond effectively to environmental change.

Our findings also suggest areas of future research that go beyond the research questions of this endeavor. Although we examined changes in form in response to environmental change, we did not explicitly examine how organizations perform *during the change* from one form to another or how long it takes them to recover from the change. Some of the speculative interpretations of our results, while logical and consistent with both theory and data, rest on assumptions of where the firms were located along what Hinings and Greenwood (1988) call 'tracks' of the transformation process. Further examination of these transitional periods would provide useful insights.

Another possibly useful tack would involve a closer look at the exceptions to some of the general patterns observed here. For example, one Defender did transform itself into an Analyzer. Similarly, not all of the Reactors that developed a coherent organizational form were found to garner performance improvements. Closer examination of these outliers may provide critical information into how to better manage the transformation process.

Although all of the usual caveats about the methodological, sample, and time-dependent nature of our findings are in order, our results generally support the importance of environment/organization matching and configurational logic in explaining the performance effects of organizational changes in industries of considerable upheaval. As prominent as these ideas are in organizational research, as noted, not all previous research has reached these conclusions. We hope future researchers find our study a useful bridge between where we have been and where we need to go in our study of organizational changes in response to environmental shifts and their performance effects.

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## Appendix A

### Factor analysis results

	Factor 1	Eigenvalue
Costs		
Change in total expenses per average number of beds	0.60147	1.53681
Costs per adjusted patient day	0.87293	0.79237
Salary per adjusted patient day	0.85686	0.47082
Performance before environmental change		
Total margin	0.69070	2.85395
Operating margin	0.55815	0.88274
Total revenue per adjusted patient day	0.58746	0.84277
Net operating revenue per number of beds	0.74298	0.50377
Percent occupancy	0.69427	0.31677
Performance after environmental change		
Total margin	0.62209	2.59798
Operating margin	0.60760	0.95563
Total revenue per adjusted patient day	0.63268	0.94566
Net operating revenue per number of beds	0.87862	0.44096
Percent occupancy	0.68523	0.15977