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The Impact of Environmental Uncertainty on the Market Orientation – Performance Relationship: A Study of the Hospital Industry[?]

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Abstract. In the past few years, market orientation has emerged as a major construct in the marketing management literature. Several studies have shown that market orientation is significantly related to organizational performance in a variety of contexts, and this relationship is therefore well established in the literature. However, several researchers have suggested that environmental factors could moderate this relationship. In this study we examine one such environmental factor, namely "environmental uncertainty." Environmental uncertainty is an important factor in both the marketing and management literature. It would be useful to know how an increase in environmental uncertainty influences the market orientation – performance relationship. We examine this issue in the hospital industry using a sample of hospitals in a five-state region of the United States. Results show that environmental uncertainty does have a significant influence on the market orientation – performance relationship, although it does not appear to have a major impact on the two constructs separately. Implications of the findings for future research as well as for hospitals are outlined.

JEL Classification Codes: M310.

Key Words: Environmental Uncertainty; Market Orientation – Performance Relationship.

1. Introduction

The construct of market orientation has received considerable attention in the marketing literature (Best, 2000; Kotler & Clarke, 1987; Shapiro, 1988;

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Narver & Slater, 1990; Kohli & Jawaorski, 1990). In a general sense, market orientation pertains to an organizational culture that emphasizes several aspects such as intelligence generation and dissemination, customer orientation, competitor orientation, responsiveness, and interfunctional coordination. Kohli and Jaworski (1990), who have conducted some of the pioneering work on market orientation, offer the following formal definition of market orientation, "the organization wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization wide responsiveness to it" (p. 6). This particular definition obviously emphasizes the three components of intelligence generation, intelligence dissemination, and organizational responsiveness. Jaworski and Kohli (1993) have designed a 32-item instrument to measure market orientation that has subsequently been revised into a 20-item instrument called MARKOR (Kohli, Jaworski, & Kumar, 1993).

It is also well accepted in the literature that market orientation is related to organizational performance. Best (2000) provides a good overview of how and why market orientation is related to performance. Several specific studies have also confirmed this relationship in recent years both in the business context in general and in the health care context in particular (Kumar, Subramanian, & Yauger, 1997; McDermott, Franzak, & Little, 1993; Narver & Slater, 1990). In a series of studies, the present authors have also confirmed the existence of a strong market orientation - performance relationship in the hospital industry (Raju, Lonial, & Gupta, 1995; Raju, Lonial, Gupta, & Ziegler, 2000; Raju & Lonial, 2001). However, although the strength of the market orientation – performance relationship appears to be fairly strong, as illustrated by these studies, the robustness of the relationship across different environments is not clear. Several researchers have proposed that environmental factors might moderate the relationship of market orientation and performance (Jaworski & Kohli, 1993; Han, Kim, & Srivastava, 1998; Kumar, Subramanian, & Yauger, 1998; Slater & Narver, 1994). Obviously, most organizations devote a considerable amount of time to a careful study of their environments. This is evidenced by the multiple chapters that marketing textbooks typically devote to various aspects of the environment, such as environmental trends, consumer behavior, and environmental forecasting (see Perreault & McCarthy, 1999 for an example). Specific techniques have also been designed to systematically analyze the effects of the environment on business strategy such as impact analysis and scenario analysis (Aaker, 1998).

Due to the importance of environmental factors for organizations, our focus in this paper is on the impact of one aspect of the environment, namely environmental uncertainty, on the market orientation – performance relationship. A significant moderating effect would mean that even when organizations are market oriented, the impact of market orientation on performance would vary depending on the nature of the environment. This, in turn, would have important implications for the allocation of resources, time, and effort to different strategies for improving organizational performance. As an extension of our previous research on the strength of the market orientation – performance relationship, in this study we test the moderating effect of environmental uncertainty on this relationship in the hospital industry. As is well known, in recent times the environment faced by hospitals has been characterized by intense competition, government regulations, and uncertainties regarding costs and insurance reimbursements. However, some hospitals have faced greater environmental uncertainty than others based on environmental factors such as labor supply, competition, and public opinion. Consequently, the hospital industry provides an ideal situation for examining the moderating effect of environmental uncertainty.

In short, the primary objective of this study is to compare the strength of the market orientation - performance relationship of hospitals that face high environmental uncertainty to those that face low environmental uncertainty. An additional objective is to determine whether the two sets of hospitals are different with respect to their market orientation or performance. Finally, we also hope to shed some light on the measurement of constructs such as market orientation, organizational performance, and environmental uncertainty in a health care context. In the next section we offer some theoretical background for the study. Subsequent sections discuss the methodology and results of the study. The concluding section offers implications of the findings for both researchers as well as for practitioners in the hospital industry.

2. Theoretical Background

As mentioned earlier, the impact of market orientation on organizational performance is well documented in the literature. Additionally, several researchers have either proposed the study of or examined the impact of various environmental influences on this relationship. In the following paragraphs, we briefly review some of the major studies that offer insights into both these aspects.

The Market Orientation – Performance Relationship

Narver and Slater (1990) studied the relationship between market orientation and performance using a sample of 140 strategic business units of a major corporation consisting of commodity product businesses and non-commodity businesses. Performance was measured using a subjective measure in which respondents were asked to compare the return on assets for their strategic business unit (SBU) in relation to all other competitors in the SBUs principal market over the past year. Results showed that for both commodity and non-commodity businesses market, orientation was an important determinant of profitability, although the nature of the relationship was somewhat different for the two types of businesses. It should be mentioned that Narver and Slater (1990) have developed their own measure of market orientation incorporating the three dimensions of customer orientation, competitor orientation, and interfunctional coordination.

Jaworski and Kohli (1993) used two samples of sizes 222 and 230 selected from the membership rosters of the Marketing Science Institute (MSI), the Dun and Bradstreet *Million Dollar Directory*, and the American Marketing Association. Market orientation was measured using a 32-item instrument designed by the researchers. They found that market orientation was significantly correlated with business performance when overall performance was assessed using judgmental measures but was not related to performance using the objective measure of market share. In relation to market share as a measure of performance, they point out that for many companies that adopt a focus or niche strategy this may be an inappropriate measure of performance. Also, there could be a lagged effect of market orientation on market share that might not be captured in a cross-sectional research design. These views argue against the use of objective measures of performance.

Han, Kim, and Srivastava (1998) did not find a significant direct effect of market orientation on performance. However, they found that market orientation does make a significant contribution to performance when we account for the moderating effects of technical (relating to products, services, and production process technology) and administrative (relating to organizational structure and administrative process) innovations. Their sample consisted of 134 banks from a midwestern state. Market orientation was measured using the Narver and Slater (1990) instrument and performance was measured using objective measures of net income growth

and return on assets with their face validity being assessed using self-reported measures.

Several studies have also examined the market orientation – performance relationship in the health care context. McDermott, Franzak, and Little (1993) designed a consolidated measure of market orientation that used several items from the Kohli and Jaworski (1993) and Narver and Slater (1990) instruments. This consolidated measure had three dimensions, namely market intelligence, interfunctional coordination, and organizational responsiveness. Their sample was comprised of 347 respondents of large U.S. general hospitals having 250 beds or more. The operating margin of the hospitals, an objective measure, was used as the measure of financial performance for the hospitals. Results showed that market orientation was related to the financial performance of hospitals although the market intelligence and interfunctional coordination dimensions had relatively more impact on financial performance than the dimension of organizational responsiveness.

Kumar, Subramanian, and Yauger (1998) extended the Narver and Slater (1990) measure of market orientation by incorporating additional dimensions, which they considered to be more relevant to the health care context. Their data were obtained from 159 hospitals listed in the American Hospital Association Guide to the Health Care Field. Hospital performance was assessed in five areas, namely growth in revenue, return on capital, success in new services/facilities, success in retaining patients, and success in controlling expenses. A subjective approach based on respondents' ratings on these performance measures was used. For all five measures of performance, the researchers found that market orientation was a significant predictor of performance.

The present authors have also examined the relationship between market orientation and performance in the hospital industry (Raju, Lonial, & Gupta, 1995; Raju, Lonial, Gupta, & Ziegler, 2000). Using a database of 175 hospitals in the midwestern United States, these studies show a strong positive relationship between market orientation and performance. Since we use the same database in the present study to examine the moderating effects of environmental uncertainty, the essential details of the database and measurement aspects will be provided later.

Although the above studies have found a positive, and often strong, relationship between market orientation and performance, it should be

pointed out that many other studies have found no relationship or only a weak direct link between the two constructs. Han, Kim, & Srivastava (1998) found a significant effect of market orientation on performance in the banking industry only when they accounted for the moderating effects of technical (relating to products, services, and production process technology) and administrative (relating to organizational structure and administrative process) innovations. Greenley (1995) and Diamantopoulos and Hart (1993) also found only a weak relationship between market orientation and performance.

Environmental Influences on the Market Orientation – Performance Relationship

Jaworski and Kohli (1993) examined the moderating effect of environmental variables such as market turbulence (the rate of change in the composition of customers and their preferences), competitive intensity, and technological turbulence (the rate of technological change) on the market orientation – performance relationship. They posited that increases in market turbulence and competitive intensity would strengthen the relationship while an increase in technological turbulence would weaken the market orientation – performance relationship. However, they did not detect any significant effects for all three variables indicating that the linkage between market orientation and performance might be sufficiently robust to be influenced by these variables.

As a follow up to their 1990 study, Slater and Narver (1994) also examined the impact of environmental variables on the market orientation – performance relationship. Their sample consisted of a total of 117 SBUs of two large Fortune 500 corporations. Market orientation was measured with the Narver and Slater (1990) instrument. Organizational performance was measured by using top management's subjective assessment of the return on assets, sales growth, and new product success of the SBU relative to all other competitors. Although Slater and Narver (1994) did confirm a positive relationship between market orientation and performance in this study, they did not find any major moderating effects for the environmental variables such as market turbulence, competitive hostility, and technological turbulence. These findings are consistent with Jaworski and Kohli's (1993) findings. On the basis of these findings, Slater and Narver (1994) concluded that organizations may not need to "adjust" their market orientation to the environment.

Earlier on we pointed out that Han, Kim, and Srivastava (1998) found a significant effect of market orientation on performance only when the effects of technical and administrative innovations were accounted for. They also hypothesized that environmental uncertainty strengthens the market orientation – innovativeness relationship. However, the results were mixed in this regard, and it is difficult to generalize these results to the overall market orientation – performance relationship.

Kumar, Subramanian, and Yauger (1998) also examined the moderating effects of competitive hostility and market turbulence on the market orientation – performance relationship in the hospital industry. For three of the five performance variables, namely return on capital, success of new services, and controlling operating expenses, they found that the relationship between market orientation and performance is strengthened when market turbulence and competitive hostility are high. Based on their results, they suggested that hospitals are likely to control operating expenses better and develop new services that have a clear market need in times of high market turbulence and competitive rivalry.

Hypotheses

In summary, it appears that there is sufficient evidence in the literature indicating that market orientation is positively related to organizational performance. This seems to be true in the general business context as well as in the hospital industry. However, the strength of the relationship is not clear since it is difficult to compare across studies and across contexts. It is also clear that several researchers have intuitively reasoned and hypothesized moderating effects for environmental variables, especially those relating to market turbulence and competitive intensity. These studies have consistently hypothesized a stronger relationship between market orientation and performance under conditions of higher environmental uncertainty. However, most of these studies have not found any significant moderating effects for these environmental variables. Since the present study also focuses on this hypothesis, it might be appropriate to briefly review the reasoning behind it. There is some evidence in the literature to suggest that organizations in more competitive environments have higher levels of market orientation (Lusch & Laczniak, 1987). Jaworski and Kohli (1993), on the basis of several earlier works (Bennett &Cooper, 1981; Houston, 1986; Tauber, 1974), argue that organizations that face more turbulent conditions are more likely to modify their products and services continually based on consumers' changing preferences, changes that force such

organizations to be more market oriented. They also suggest that, under conditions of intense competitive rivalry, customers have many alternative options to satisfy their needs and wants, which, again, forces organizations to become more market oriented. On the basis of these arguments, it seems intuitively reasonable to assume that organizations facing "high uncertainty" environments will tend to be more market oriented. However, for reasons that are somewhat unclear from the literature, there seems to be an intuitive leap from these arguments to suggesting that the market orientation – performance relationship will also be stronger in "high uncertainty" environments (Jaworki & Kohli, 1993; Slater & Narver, 1994). One would assume that organizations operating in environments characterized by high uncertainty tend to become more market oriented since they can clearly see a direct effect of the market orientation on their performance. Although most studies did not find a significant moderating effect of environmental uncertainty on the market orientation – performance relationship, there is some reason to believe that the hospital industry might be different in this regard since it is characterized by a relatively high degree of heterogeneity among organizations within the industry. Hospitals vary by size, location, specialty, type (non-profit vs. profit), and many other factors. We feel that such heterogeneity within the industry makes the market orientation – performance much more susceptible to the effects of environmental uncertainty. In this regard, it is notable that the only study to have found a significant moderating effect for environmental variables was the one conducted in the hospital industry (Kumar, Subramanian, & Yauger, 1998). However, it is not clear from the studies discussed above whether organizational performance varies with environmental uncertainty. Intuitively, it appears that organizational performance itself should suffer in times of high environmental uncertainty. At the same time, organizations are perhaps forced to become more market oriented in times of high uncertainty just to maintain the level of performance that they have achieved in less uncertain times. If that is the case, one would not see a significant difference in the performance level of hospitals facing high and low uncertainty environments.

Based on the above discussion, we offer the following three hypotheses:

Hypothesis 1: Hospitals in "high uncertainty" environments will be characterized by higher levels of market orientation than hospitals in "low uncertainty" environments.

Hypothesis 2: Hospitals in " high uncertainty" environments will not be significantly different from hospitals in "low uncertainty" environments in terms of their performance.

Hypothesis 3: Hospitals in "high uncertainty" environments will be characterized by a stronger relationship between market orientation and performance.

3. Methodology

Data Collection

Data for this study were collected using a questionnaire that was mailed to the top executives of 740 hospitals in a five-state region in the midwestern United States (Kentucky, Minnesota, Mississippi, Ohio, and Tennessee). This represented almost all the hospitals in the region (97%), and the hospitals in the five states accounted for approximately 12 % of the hospitals in the nation. Useable responses were obtained from 175 hospitals for a response rate, at the hospital level, of 24%. In order to get an idea of how the sample compared with the population of hospitals, the size distribution of hospitals in the sample was compared with the size distribution of all of the hospitals in the region as well as in the entire United States. Hospital size distribution in the sample based on the number of beds was: less than 100 beds, 26.7%; 100-300 beds, 43.75%; and 300 or more beds, 29.5%. Although slightly skewed toward the larger hospitals, these percentages compare very favorably with the population distribution of hospitals in the five-state region as well as in the U.S.

Four surveys were mailed to the chief executive of each hospital. Instructions on the cover letter requested the chief executive to complete one survey and forward the other three surveys to three other senior executives in the hospital, preferably vice-presidents in the areas of quality, marketing, and operations. A total of 293 responses were received from the top executives of the 175 hospitals that responded. Approximately 37% of the hospitals sent in multiple responses while the rest sent in only a single response, usually from the CEO. Preliminary analysis revealed no major differences on relevant variables between hospitals that sent in a single response and those that sent in multiple responses. Since the analysis in this study was at the hospital level, any multiple responses from a single hospital were averaged across the respondents for that hospital for each variable in

order to come up with an aggregated response for that hospital. Since a majority of the hospitals (63%) sent in only a single response, such aggregation had no serious effects on the results of the study.

Measurement of Constructs

Market Orientation: Jaworski and Kohli's (1993) instrument consisting of 32 items was selected to measure market orientation. However, since the original instrument had been developed within a manufacturing setting, appropriate modifications were made to this instrument for use in the health care context. The wording of the original items was modified and two items were deleted resulting in a 30-item instrument. Response to each item was measured using a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5) following the procedure adopted by Jaworski and Kohli (1993).

Based on an exploratory factor analysis with varimax rotation, four factors were extracted from the 30 market orientation items. Sixteen of the 30 items loaded on these four factors explaining 60.5% of the total variance. The factors were labeled "intelligence generation" (factor 1), "customer satisfaction" (factor 2), "responsiveness to customers" (factor 3), and "responsiveness to competitors" (factor 4). While this factor structure is somewhat different from the factors postulated by Kohli and Jaworski (1990), the dimensions themselves are consistent with the Kohli and Jaworski (1990) and Narver and Slater (1990) frameworks. The Cronbach's alpha measure of reliability for the four factors was 0.82 for factor 1, 0.73 for factor 2, 0.69 for factor 3, and 0.71 for factor 4. The factor structure was also tested using confirmatory factor analysis at several levels. These measurement models are well documented in earlier works by the authors and, in order to conserve space, the results are not reproduced here. Results of these measurement models supported the identified factor structure quite well. The items that loaded on the four factors are shown in Table 1.

Organizational Performance: As discussed earlier in the "theoretical background section," performance can be measured using objective measures (such as ROI, market share, etc.) or judgmental measures that are based on executives' perception of how the organization is performing relative to the competition. Since most hospitals might be unwilling to reveal objective performance data and since such measures might exhibit lagged effects in relation to market orientation, we chose to use subjective judgmental measures to assess organizational performance. Such

judgmental measures have been used in the past by Jaworski and Kohli (1993), Narver and Slater (1990), and Kumar, Subramanian, and Yauger (1998). The hospital executives were asked to rate their hospitals on 19 performance variables relative to their competitors. A scale of 1 (much worse than the competition) to 5 (much better than the competition) was used. The 19 performance variables were generated based on a review of the hospital performance related literature as well as on interviewing key executives at local hospitals.

TABLE 1: Market Orientation Dimensions

INTELLIGENCE GENERATION
1. In our hospital we meet with customers(i.e. physicians, businesses, insurance companies, and patients) at least once a year to find out what products or services they will need in the future.
2. Individuals from our operations interact directly with customers to learn how to serve them better.
3. In our hospital we do a lot of in-house market research.
4. We survey customers at least once a year to assess the quality of our products and services.
5. We often talk with or survey those who can influence our patients' choices (e.g. , physicians, health maintenance organizations).
6. We collect industry information.
CUSTOMER SATISFACTION
7. Data on customer satisfaction are disseminated at all levels in this hospital on a regular basis.
8. Customer complaints fall on dead ears in this hospital.
9. When we find out that customers are unhappy with the quality of our service, we take corrective actions immediately.
10. When we find out that customers would like us to modify a product or service, the departments involved make concerted efforts to do so.
REPONSIVENESS TO CUSTOMERS
11. We are slow to detect changes in our customers' product/service preferences.
12. We are slow to detect fundamental shifts in our industry (e.g. competition, technology, regulations).
13. There is minimal communication between marketing and operations concerning market developments.
14. Our business plans are driven more by technological advances than by market research.
REPONSIVENESS TO COMPETITION
15. If a major competitor were to launch an intensive campaign targeted at our customers, we would implement a response immediately.
16. We are quick to respond to significant changes in our competitor's pricing.

Exploratory factor analysis of the 19 performance variables extracted three factors explaining 69.3% of the total variance. Thirteen of the 19 variables loaded on these three factors. The factors were labeled "financial performance" (factor 1), "market/product development" (factor 2), and "quality outcomes" (factor 3). The Cronbach's alpha reliabilities for the three factors were 0.95 for factor 1, 0.86 for factor 2, and 0.57 for factor 3. Although the reliability of the quality outcomes factor is somewhat below the normally acceptable value of 0.70 we decided to retain this factor in the analysis since it had an eigen value above 1 and the four items that loaded on this factor all had factor loadings above 0.6. Additionally, there is a precedent for using quality outcome variables as a dimension of performance (Morgan & Piercy, 1998). Just as in the case of market orientation, confirmatory factor analysis revealed that the measurement models supported the factor structure quite well. The thirteen items that loaded on the three performance factors are shown in Table 2.

TABLE 2: Performance Dimensions

FINANCIAL PERFORMANCE
1. Net Profits 2. Return on Investment 3. Cash Flow from Operations 4. Return on Assets 5. Profit to Revenue Ratio
MARKET / PRODUCT DEVELOPMENT
6. New Product/ Service Development 7. Investments in R&D Aimed at New Innovations 8. Capacity to Develop a Unique Competitive Profile 9. Market Development
QUALITY OUTCOMES
10. Mortality and Morbidity Rate 11. Service Quality as Perceived by Customers 12. Cost Per Adjusted Discharge 13. Employee Turnover

Environmental Uncertainty: This was assessed by having respondents rate the degree of uncertainty associated with twelve different aspects of the hospital environment. A five- point scale was used to rate the uncertainty associated with each particular item with 1 being "very low" and 5 being "very high." The twelve elements included: suppliers of materials, suppliers

of capital equipment, labor supply, labor unions, customers, competitors, government regulations, public opinion, technological advances, industry associations, financial markets, and the general economy. These environmental variables were adapted from a study by Burke (1984) on factors that influenced the strategic choices of firms. It is important to note that the study by Burke delineated thirteen environmental elements that were deemed the most relevant to business strategy based on a review of several earlier studies. Similar environmental uncertainty measures, albeit based on fewer elements, have also been used extensively in the management literature (Miller, 1991; Miller & Droge, 1986). After preliminary interviews with hospital executives for the present study, two of these 13 measures were replaced with two other elements that were thought to be more relevant to the hospital industry. However, one of these items was subsequently deleted from the analysis because there were indications that the item was somewhat ambiguous to the respondents leaving 12 items to measure environmental uncertainty. The measure of environmental uncertainty used for the analysis was a simple summation of the uncertainty ratings of the twelve environmental variables. Since five-point scales were used, this summated score could range from 12 to 60. The Cronbach alpha value for reliability of these twelve items was 0.73.

4. Analyses and Results

The environmental uncertainty score was used to create a median split of the 175 hospitals into two groups with 87 hospitals in the low uncertainty group and 88 hospitals in the high uncertainty group. Two types of analyses were performed on the groups based on the hypotheses that were identified earlier. In the first analysis the differences between the two groups were examined on the market orientation dimensions and the performance dimensions. In the second analysis, the relationship between market orientation and performance was examined using structural equations modeling. Since both market orientation and performance are conceptualized as being multidimensional constructs, structural equations modeling is an ideal technique to use in this situation.

Differences Between the Low and High Uncertainty Groups

Each of the dimensions of market orientation and performance was represented by a summated score of the items loading on that dimension (see Tables 1 & 2). Table 3 shows the results of the t-tests for the dimensions of

each construct. It can be seen that only one dimension of market orientation, namely "responsiveness to competitors" (factor 4) showed a significant difference between the two groups. Hospitals facing higher environmental uncertainty were more responsive to competitors. Hypothesis 1 was therefore supported to a limited extent for one of the four dimensions of market orientation. None of the performance dimensions showed a significant difference between the groups. This supports Hypothesis 2.

TABLE 3:Effect of Environmental Uncertainty on Market Orientation and Performance

MARKET ORIENTATION			
FACTOR	Low Uncertainty	High Uncertainty	t - value
1. Intelligence Generation	21.439	22.208	-1.19
2. Customer Satisfaction	14.836	14.880	-0.11
3. Responsiveness to Customers	13.003	13.058	-0.15
4. Responsiveness to Competitors	6.304	6.994	-3.22[a]
PERFORMANCE			
FACTOR	Low Uncertainty	High Uncertainty	t-value
1. Financial Performance	15.627	$16.790	-1.92
2. Market/Product Development	12.210	$12.715	-1.17
3. Quality Outcomes	13.750	$14.128	-1.20

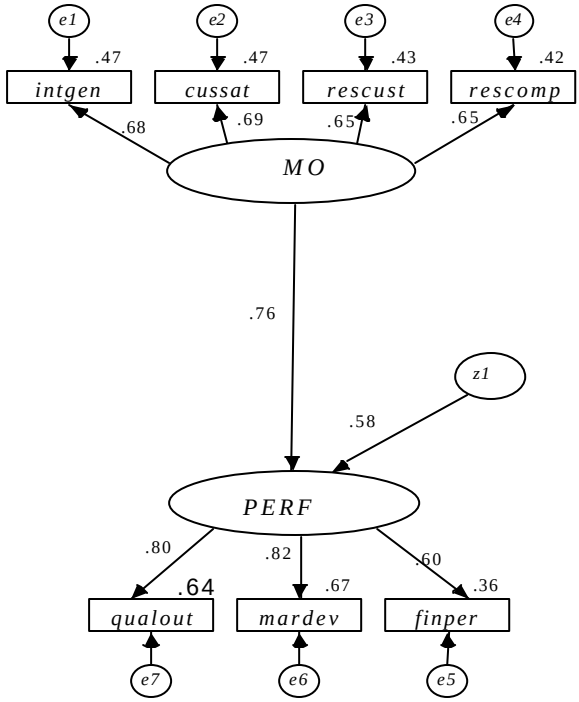
a - significant at the 0.05 level

Path Model Analysis

The relationship between the market orientation and performance constructs was examined for each of the groups using structural equations modeling. The Amos 4.0 software package was used for the analysis (Arbuckle & Wothke, 1999). Figures 1 and 2 show the path models for the low and high uncertainty groups respectively. It can be seen that the relationship between market orientation and performance is much stronger (standardized regression coefficient of 0.94) in the high uncertainty group than in the low uncertainty group (standardized regression coefficient of 0.76). The goodness of fit indices for both models were quite good. For the high environmental uncertainty group the major indices were as follows:

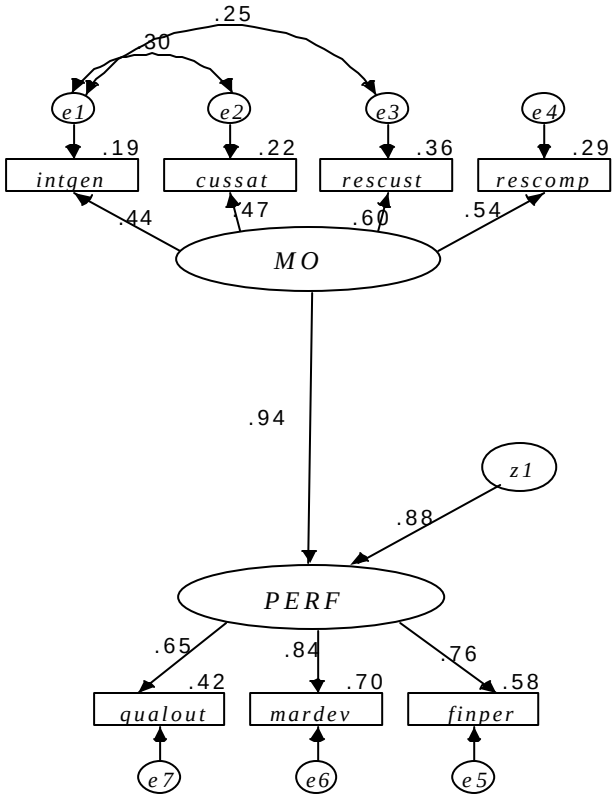
$?^2$ =11.20, $?^2$/df = 1.02, RMR= 0.21, GFI=0.97, AGFI=0.92, TLI=0.99, and CFI=0.98. For the low environmental uncertainty group the goodness of fit indices were: $?^2$ = 9.39, $?^2$/df = 0.72, RMR= 0.23, GFI=0.97, AGFI=0.94, TLI=1.00, and CFI=1.00. All these indices are within acceptable ranges. Individual goodness of fit measures are not discussed in detail here since these indices are described in most standard books that discuss the technique of structural equations modeling (Bollen, 1989; Hair, Anderson, Tatham, & Black, 1995). It is clear that these results support Hypothesis 3.

FIGURE 1: Low Environmental Uncertainty



Note: MO = Market Orientation; intgen=intelligence generation; cussat=customer satisfaction; rescust = responsiveness to customers; and rescomp=responsiveness to competition; Perf=Organizational Performance; finper=financial performance; mardev=market/product development; qualout = quality outcomes. The terms e1,e2, and son on and z1. z2. and so on are standard notations for the error terms in the equations.

FIGURE 2: High Environmental Uncertainty



Note: Please refer to the note under Figure 1. The same applies to this figure.

5. Discussion and Implications

Measurement Related

Prior to discussing the results in relation to the hypotheses that were formulated earlier, it is worth making some observations relating to the

measurement of the two constructs of market orientation and performance. Our study clearly supports the idea that both constructs are multidimensional constructs. In the case of market orientation, most researchers have conceptualized this construct as being multidimensional. However, researchers have not always agreed on exactly what the dimensions of market orientation are. One piece of evidence confirming this controversy is the difference in the dimensions of market orientation postulated by Kohli and Jaworski (1990) and Narver and Slater (1990) in their respective frameworks. The present study appears to indicate that the dimensions of market orientation might also vary with the nature of the industry being dealt with. The dimensions for market orientation that we found in the hospital industry appear to be a compromise between the two frameworks and seem to include some aspects of each.

In the case of performance our study shows that there are three different dimensions to performance. Often there is a tendency for researchers and practitioners to consider performance as being unidimensional, with the focus being primarily on financial performance. This study shows that it is important to consider all aspects of performance in order to obtain a more comprehensive picture of the influence of various factors on organizational performance. Of course, we are not unique in endorsing this view of performance. Other researchers have also recommended using multiple dimensions of performance (Flood, Shortell, & Scott, 1994; Kaplan & Norton, 1992; Shortell et. al., 1995; Morgan & Piercy, 1998). The implication of these findings, from a measurement standpoint, is that there is much more work to be done in terms of measuring these constructs, especially in terms of the exact nature of the dimensions themselves as well as their stability across different industries and contexts.

Hypotheses Related

The present study also yields several insights regarding the specific hypotheses relating to market orientation and performance. With respect to market orientation, it is clear that the results do not strongly support the notion that hospitals facing higher environmental uncertainty have a stronger market orientation than those facing lower environmental uncertainty. As pointed out in the "theoretical background" section, several researchers have also hypothesized this relationship in the past, but there seems to be little empirical evidence to support it. The lack of support for this hypothesis in our study is therefore not surprising. We did, however, find that one particular dimension of market orientation, namely responsiveness to

competitors, did exhibit a highly significant difference between the low and high uncertainty groups. It appears that hospitals facing higher environmental uncertainty appear to be much more responsive to competition. This seems to indicate that the primary means used by hospitals to counter the threat of high environmental uncertainty is to monitor the competition very closely and respond effectively to the actions of competitors. However, environmental uncertainty does not seem to influence the dimensions of "intelligence generation," "customer satisfaction," or "responsiveness to customers." One reason could be that these three dimensions are more dependent on the policies set within the hospital, while the actions of competitors are highly unpredictable especially in times of high environmental uncertainty. In such situations the most serious threat facing a hospital is the threat of being blindsided by the actions of a competitor.

In the case of organizational performance, the results are consistent with Hypothesis 2. The fact that environmental uncertainty does not seem to affect any of the dimensions of performance means that hospitals are successful in doing whatever is necessary in order to maintain their performance over different environmental conditions. However, it should be noted that in this study performance was assessed subjectively relative to the competition. It is possible that if one considers objective indices of performance such as actual net profits, return on assets, etc. these could be lower for all hospitals facing high environmental uncertainty conditions. What can be said, on the basis of these results, is that hospital performance in relation to competition does not seem to be affected by environmental uncertainty. This reinforces the need to conduct studies with both objective and subjective measures of performance and compare the results in order to obtain a true indication of how environmental uncertainty affects organizational performance.

The results support the hypothesis that the relationship between market orientation and performance is stronger for hospitals in the high environmental uncertainty group. Although this has been suggested by several researchers in the past, most of the studies done have not found any empirical support for it. The only exception was a study in the hospital industry (Kumar, Subramanian, and Yauger, 1998). Since our study was also conducted in the hospital industry, it suggests that there might be some unique industry characteristics that bring about support of this hypothesis. If so, such industry characteristics remain to be identified in future research. For hospitals, the result clearly shows that it would be beneficial for them to

monitor their marketing activities and to see that they maintain a high level of market orientation in times of high environmental uncertainty. However, this does not mean that hospitals facing low environmental uncertainty should not be market oriented. This is evidenced by the fact that the relationship between market orientation and performance is quite strong even in the low uncertainty group. In the low uncertainty group almost 58% (0.76^2) of the variance in performance is explained by market orientation while the figure for the high uncertainty group is 88% (0.94^2). Clearly, market orientation is an important determinant of performance for both groups.

Limitations

While interpreting the significance of the results, it is also important to keep in mind some of the limitations of this study. First, it would be beneficial to use both objective and subjective measures of performance in studies of this kind. Unfortunately, obtaining objective performance results for hospitals is not always easy. Subjective measures, on the other hand, are easier to obtain in questionnaire studies and one can include a wide variety of items. Also, while objective measures of financial performance can be obtained in some cases, it may not be possible to obtain objective measures of other performance dimensions such as market/product development and quality outcomes consistently across hospitals.

A second possible limitation is in relation to the measurement of environmental uncertainty. The present study used a unidimensional measure of environmental uncertainty. Although this measure incorporated many elements of the environment mentioned in the literature, a question remains as to whether there are multiple dimensions of environmental uncertainty and if these dimensions have different effects on the market orientation – performance relationship. Jaworski and Kohli (1993) hypothesized different effects for market turbulence, competitive intensity, and technological turbulence. However, their data did not lend support to these multiple hypotheses, and therefore it is not clear if these are indeed separate aspects of environmental uncertainty. This suggests that there perhaps needs to be further refinement of the environmental uncertainty measure in the future.

Finally, the sample size might have been a limiting factor in this study. Although we had a reasonable sample size of 175 hospitals included in the study from a five state region, this sample provided only about 88 hospitals

for each of the two levels of environmental uncertainty. A larger sample might have allowed us to divide hospitals into more homogeneous groups based on size or type and examine the effects of environmental uncertainty on different types of hospitals.

6. Conclusion

The results of this study lead to four major conclusions with respect to the hospital industry. First, market orientation has a strong effect on hospital performance irrespective of the degree of environmental uncertainty faced by the hospital. Second, the relationship between market orientation and performance is much stronger for hospitals in high uncertainty environments. Thus, these hospitals should work harder to ensure that their market orientation is maintained at high levels. Third, hospitals in high uncertainty environments appear to be focusing more on the responsiveness to competitors dimension of market orientation than on the other three dimensions. While this seems to make sense intuitively, it might be worthwhile examining why hospitals don't emphasize the other dimensions of market orientation. Lastly, environmental uncertainty does not appear to influence any of the dimensions of hospital performance. Whether this is a function of the type of performance assessment used, i.e. subjective vs. objective measures, remains to be examined in future studies. In general, the findings of this study reveal that environmental uncertainty is an important moderator of the relationship between market orientation and organizational performance in the hospital industry.

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